To: Lipshultz, Jon (ENRD)[Jon.Lipshultz@usdoj.gov]; Anderson, Lea[anderson.lea@epa.gov]; Marks, Matthew[Marks.Matthew@epa.gov]
Cc: O'Donnell, Jessica (ENRD)[Jessica.O'Donnell@usdoj.gov]
From: Spence, Samara (ENRD)
Sent: Wed 11/30/2016 7:50:51 PM
Subject: RE: Arkansas Regional Haze
RH Petition - Ark Affordable Energy.pdf

It looks like we missed a seventh petition:

Arkansas Affordable Energy Coalition v. EPA, No. 16-4296 (8th Cir.) (filed 11/23/16)

Ex. 5 - Attorney Client

Samara

From: Lipshultz, Jon (ENRD)
Sent: Wednesday, November 30, 2016 11:04 AM
To: Anderson, Lea <anderson.lea@epa.gov>; Spence, Samara (ENRD) <SSpence@ENRD.USDOJ.GOV>; Marks, Matthew <Marks.Matthew@epa.gov>
Cc: O'Donnell, Jessica (ENRD) <JO'Donnell@ENRD.USDOJ.GOV>
Subject: RE: Arkansas Regional Haze

Got a bounce back from EPA, apparently because the file size of the attachments was too big. Anyhow, here are the captions and docket numbers of the new petitions:

1. Entergy Arkansas v. EPA, No. 16-4298 (8th Cir.) (filed 11/28/16)

2. National Parks Conservation Ass'n v. EPA, No. 16-4309 (8th Cir.) (filed 11/28/16)

3. Energy and Environmental Alliance of Arkansas v. EPA, No. 16-4304 (8th Cir.) (filed 11/28/16)

4. Domtar A.W. LLC v. EPA, No. 16-4302 (8th Cir.) (filed 11/28/16)

5. Arkansas Electric Cooperative Corp. v. EPA, No. 16-4300 (8th Cir.) (filed 11/28/16)

From: Lipshultz, Jon (ENRD)
Sent: Wednesday, November 30, 2016 10:50 AM
To: 'Anderson, Lea' <anderson.lea@epa.gov>; Spence, Samara (ENRD) <SSpence@ENRD.USDOJ.GOV>; Marks, Matthew <Marks.Matthew@epa.gov>
Cc: O'Donnell, Jessica (ENRD) <JO'Donnell@ENRD.USDOJ.GOV>
Subject: RE: Arkansas Regional Haze

All: In case you have not seen, 5 additional industry and environmental petitions for review of the Arkansas regional haze FIP have now been filed as well. Copies attached. Samara and Jessica – I'll have Medina update CMS accordingly. Jack

From: Anderson, Lea [mailto:anderson.lea@epa.gov]
Sent: Monday, November 28, 2016 5:23 PM
To: Spence, Samara (ENRD) <SSpence@ENRD.USDOJ.GOV>; Lipshultz, Jon (ENRD) <JLipshultz@ENRD.USDOJ.GOV>; Marks, Matthew <Marks.Matthew@epa.gov>
Cc: O'Donnell, Jessica (ENRD) <JO'Donnell@ENRD.USDOJ.GOV>
Subject: Re: Arkansas Regional Haze

Looking forward to working with you again, Samara!

From: Spence, Samara (ENRD) <Samara.Spence@usdoj.gov>
Sent: Monday, November 28, 2016 4:42 PM
To: Lipshultz, Jon (ENRD); Anderson, Lea; Marks, Matthew
Cc: O'Donnell, Jessica (ENRD)
Subject: RE: Arkansas Regional Haze

Hi folks – I'm glad to be working with you again! I'll be in touch later this week about addressing this scheduling order. **Ex. 5 - Attorney Client**

Ex. 5 - Attorney Client

Best,

Samara

From: Lipshultz, Jon (ENRD)

Sent: Monday, November 28, 2016 4:16 PM
To: Anderson, Lea <anderson.lea@epa.gov>; Marks, Matthew <Marks.Matthew@epa.gov>
Cc: Spence, Samara (ENRD) <SSpence@ENRD.USDOJ.GOV>; O'Donnell, Jessica (ENRD) <JO'Donnell@ENRD.USDOJ.GOV>
Subject: Arkansas Regional Haze

Lea and Matt – Just wanted to let you know we've assigned the new Eighth Circuit challenge to the Arkansas regional haze FIP to Samara Spence, who is copied here and can be reached at 202-514-2285. Jessica O'Donnell (202-305-0851) will supervise. Thanks! Jack

Jack Lipshultz

Assistant Section Chief

Environmental Defense Section

(202) 514-2191

To: OGC ARLO[OGC_ARLO@epa.gov]
From: Graham, Cheryl
Sent: Mon 2/13/2017 1:38:18 PM
Subject: 02/13/17 Reg Review Agenda Updates
17-02-13 agenda.docx

Attached is the strikeout version of the reg agenda, if you have any additions/deletions please let me know by 11:00 today. Reg Review is schedule for today at 2:30 in room 4045.

Thank you

Cheryl R. Graham
OGC/ARLO
(202) 564-5473

To: Pilchen, Zach[Pilchen.Zach@epa.gov]
From: Hogan, Stephanie
Sent: Fri 12/2/2016 2:33:25 PM
Subject: FW: 12/5/16 Reg Review Agenda Updates
16-12-05 agenda.docx

Zach,

Can you add the deadlines from the pending CD in the ND Cal re the Cal iSIP? I know there are some coming up related to some of my PSD work that aren't listed on reg review.

Thanks!

Stephanie L. Hogan | US EPA | Office of General Counsel | Air and Radiation Law Office | Mail Code 2344A | phone: (202) 564-3244 | fax: (202) 564-5603

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-----Original Message-----
From: Graham, Cheryl
Sent: Thursday, December 01, 2016 5:50 PM
To: OGC ARLO <OGC_ARLO@epa.gov>
Subject: 12/5/16 Reg Review Agenda Updates

Attached is the strikeout version of the reg agenda, if you have any additions/deletions please let me know by 11:00 Monday. Reg Review is scheduled for Monday (12/5) at 2:30pm in room 4045.

Thank you

Cheryl R. Graham
OGC/ARLO
(202) 564-5473

Summary of Outstanding Issues with Texas and Arkansas Regional Haze Plans

Overview

In both Texas and Arkansas, EPA adopted (or proposed to adopt) a Federal Implementation Plan (FIP) to address the technology and reasonable progress requirements for regional haze in the Clean Air Act (and EPA's Regional Haze Rule). Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Regional Haze for Texas

- There are two regional haze actions in Texas: a Federal Implementation Plan (FIP) addressing the reasonable progress requirement and a proposed FIP addressing the technology requirement (i.e., Best Available Retrofit Technology or BART).
- **Reasonable Progress FIP:** On January 5, 2016, EPA finalized a reasonable progress FIP that required controls on 14 coal-fired EGUs (SO_2 scrubber upgrades and retrofits). These controls were determined to be needed for reasonable progress based on costs and visibility impacts at nearby Class I areas.
- The 5th Circuit Court stayed the FIP in July 2016 and remanded the FIP, in response to a motion by EPA, in March 2017.
- **BART FIP:** On January 4, 2017, EPA proposed a BART FIP that required controls on 18 coal-fired EGUs, some being the same facilities as in the Reasonable Progress FIP. Proposed controls included SO_2 scrubber upgrades and retrofits.
- BART for EGUs had not been addressed in the Reasonable Progress FIP because in early 2016 Texas' status with respect to EPA's regional trading program (i.e., the Cross-State Air Pollution Rule or CSAPR) was in flux due to litigation. Texas had successfully challenged CSAPR, which was partially remanded to EPA.
- To resolve that partial remand, EPA had proposed (prior to proposing the BART FIP) that Texas is not required to address transport requirements for certain $PM_{2.5}$ NAAQS. As such, Texas and EPA would not be able to rely on CSAPR better-than-BART for SO_2.
- Ex. 5 - Deliberative Process
- Ex. 5 - Deliberative Process the proposed BART FIP relied on CSAPR only for NOx and proposed the 18 new and upgraded SO_2 controls.
- **Key Deadline:** We have a court-ordered deadline for signature of the final action on the BART FIP by September 9, 2017. After a recent extension of the comment period to May 5, 2017, EPA requested a 30-day extension of the final deadline, but has not yet succeeded in obtaining the extension. If EPA does not obtain the extension, EPA will need to finalize a BART FIP, which could later be revised or replaced by a SIP.
- **Key Issues and Future Decisions Needed:** Reasonable Progress FIP. EPA must act on the 5th Circuit Court remand. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process A judicial stay will remain in place during the course of the remand. At present, there is no deadline for this action.

BART FIP: Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Regional Haze for Arkansas

- On September 27, 2016, EPA finalized a FIP addressing NOx and SO_2 technology and reasonable progress requirements for sources in Arkansas. Petitioners, including Arkansas, affected sources, and environment groups, have challenged the FIP.
- EPA is in the process of granting some aspects of the petitions for reconsideration on the Arkansas FIP, and is also currently in 90-day settlement talks with the parties.
- **Issues on which EPA Committed to Grant Reconsideration/Administrative Stay:**
  - *All emission limits for White Bluff Units 1 and 2 in light of early unit retirement:* Reconsideration of all requirements for White Bluff is reasonable because we were unable to adjust the final FIP to consider Entergy's late comments stating that the White Bluff units may shut down in 2025 and 2026; Ex. 5 - Deliberative Process
  - *NO_X compliance timeframes and value of emission limits:* There are issues with the timing and value of NO_X emission limits for White Bluff, Independence, and Flint Creek (timing only), which could be resolved through reconsideration.
  - Timing of compliance with SO_2 emission limits at Independence.
- **Issues on Which EPA Did Not Commit to Grant Reconsideration/Administrative Stay,** Ex. 5 - Deliberative Process
  - *CSAPR Better than BART for EGUs:* EPA finalized source-specific NO_X limits for 5 BART facilities instead of relying on CSAPR as an alternative to NO_X BART. Reliance on CSAPR in a future FIP or SIP revision is contingent upon EPA finalizing the national rulemaking determining that revised CSAPR is better than BART.
  - *Reasonable Progress Controls:* Independence was controlled under the rule provisions for reasonable progress; the State and Entergy disagree that the controls are needed at this time for reasonable progress given that Class I areas affected by Arkansas are below the glide path.
  - *SO_2 BART emission limit for Domtar Ashdown Paper Mill:* Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

- **Key Deadline:** The court has stayed the litigation briefing schedule and is requiring EPA to provide a status report on settlement talks by June 9, 2017; Ex. 5 - Deliberative Process
- **Future Decisions Needed:**

Ex. 5 - Deliberative Process

 Internal deliberative pre-decisional draft

REGIONAL HAZE PROGRAM

ISSUE SUMMARY:

- The regional haze program, established and described in the Clean Air Act (CAA), helps to protect visibility in 156 national parks and wilderness areas where vistas are often impacted and/or obscured by haze. Regional haze is caused by the emission of air pollutants (both particles and particle precursors) from numerous sources located over a wide geographic area. (Fine particle pollution can also cause serious health problems and premature death.)
- Consistent with CAA authority and obligations, in 1980 and 1999, EPA established regulations regarding implementation of the CAA mandate to prevent any future, and remedy any existing, visibility impairment in national parks and wilderness areas.
- The regional haze program is divided into multiple implementation periods extending through 2064, with the first period extending from 2008-2018, the second period from 2018-2028, etc,
    - First planning period work includes reviewing state plans for meeting regional haze requirements, as well as any regulatory action regarding such plans. EPA has approved (in full or in part) state regional haze plans for 45 states, adopted federal plans for 3 states, and still needs to address plans for 4 states.
        - Between submittal of the first and second planning period SIPs, states are required to provide progress reports. EPA has approved 10 progress reports, is currently reviewing 25 progress reports, and is awaiting submittal of 5 progress reports.
    - Second planning period work for EPA includes finalizing revisions to the regional haze rule that were proposed in April 2016, and also a companion proposed guidance document to support next steps on implementation of the regional haze program. With these rule revisions, state plans for the second planning period will be due in 2021 (not 2018).
- Since implementation of the program began in 2000 emissions of visibility-impairing pollutants have declined dramatically (more than 500,000 TPY of SO2 and 300,000 TPY of NOx) and visibility has improved significantly (average visual range increased by 20 – 30 miles in Class I areas).

UPCOMING MILESTONES:

First planning period milestones. With regard to milestones related to the first planning period, there are a few actions that remain ongoing where the EPA is reviewing state plans to implement regional haze obligations and/or EPA is developing a plan for such implementation. These include, for example:

- EPA Region 6 proposed federal implementation plan for sulfur dioxide (SO_2) at electric generating units (EGUs) in Texas, as well as nitrogen oxides (NO_x) best available retrofit technology (BART) in Texas (Consent Decree deadline of December 9, 2016)
- EPA Region 9 to issue final action on Arizona's BART state implementation plan revision (target December 2016)
- EPA Region 7 to issue a proposed revision of the federal implementation plan for regional haze in Nebraska (target December 2016/January 2017). This action is needed because of a partial voluntary remand of the Nebraska regional haze federal implementation plan that did not include any new controls on the Gerald Gentleman power plan. **Ex. 5 - Deliberative Process**

REGIONAL HAZE PROGRAM

[redacted]

process Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

- EPA Region 6 to issue a proposed action (either approval or partial disapproval/partial FIP) on Louisiana's regional haze state implementation plan revision (consent decree deadline of March 31, 2017).

Second planning period milestones. On November 5, 2016, consistent with the EPA's Action Development Rulemaking Process, EPA forwarded to the Office of Management and Budget (OMB) a final version of the regional haze rule revisions for interagency review. December 20, 2016 is the anticipated signature date. Concurrent with the EPA's proposed regional haze rule revisions in April 2016, EPA also proposed guidance to assist states and other stakeholders with implementation of the regional haze rules. The proposed rule included various changes aimed at increasing the efficiency of regional haze implementation during the second planning period, clarifying confusing aspects of the existing regulations, and allowing states an additional 3 years (beyond the current deadline of July 31, 2018) to submit implementation plans for the second planning period. The proposed guidance addresses two key aspects of the program: (1) evaluating the Clean Air Act factors regarding reasonable progress; and (2) visibility tracking progress based on impacts from controllable anthropogenic emissions versus all sources. Importantly, these rule revisions are necessary to provide for the state planning deadline extension to July 2021.

- Final rulemaking signed by Administrator (target date - December 20, 2016)
- Ex. 5 - Deliberative Process

BACKGROUND:

- Visibility impairing pollution is produced by a multitude of sources and activities that are located across a broad geographic area and emit particulate matter (or precursors to form particulate matter) of a diameter equal to or less than 10 or 2.5 microns (PM_{10} or $PM_{2.5}$, respectively). Examples of these pollutants include sulfates, nitrates, organic carbon, elemental carbon and soil dust, as well as precursors such as SO_2, NO_x, volatile organic compounds (VOCs) and ammonia. The focus of the regional haze program is on anthropogenic sources of visibility impairing pollutants.
- These pollutants, such as PM_{10} and $PM_{2.5}$, are also associated with serious health effects in humans and contribute to environmental effects such as acid deposition and eutrophication. The regional haze program is implemented primarily by state and local areas which develop plans consistent with the CAA and EPA's regulations.
- EPA works collaboratively with Federal Land Managers (FLMs) in implementing this program – including the National Park Service, the United States Forest Service, and the United States Fish and Wildlife Service. Based on visibility data through 2015, considerable visibility improvements have been made in Class I areas:
    - average visual range improved in eastern areas from approximately 50 miles in 2000 to 70 miles in 2015
    - average visual range improved in western areas from approximately 90 miles in 2000 to 120 miles in 2015.
- The National Park Service estimates that as of mid-2014, emission controls established under the first planning period led to approximately 500,000 tons/year of SO_2 and 300,000 tons/year of NO_x reductions.

REGIONAL HAZE PROGRAM

As part of the regional haze program, under the CAA, states must evaluate the use of retrofit controls at certain larger, often uncontrolled, stationary sources in order to address visibility impacts from these sources. The CAA directs states to include measures as may be necessary to make reasonable progress towards the natural visibility goal. This includes a requirement that certain categories of existing major sources procure, install and operate the best available retrofit technology, or BART.

- Under the regional haze program, states are required to submit periodic plans demonstrating how they have and will continue to make progress towards achieving their visibility improvement goals. The first state plans were due in 2007 and covered the 2008-2018 first planning period..
- Although the vast majority of states submitted approvable plans for the first planning period, some states either did not submit plans or submitted deficient plans – thus requiring EPA to issue a federal implementation plan. There is also ongoing litigation regarding some actions taken by EPA during the first planning period. Litigation issues include: reliance on the Cross State Air Pollution Rule (CSAPR) to satisfy EGU BART; FIPs; and disapproved SIPs, among other issues.
- The most recent litigation-related decision includes a decision by the Fifth Circuit Court of Appeals to stay implementation of EPA's January 2016 final action that partially approved and partially disapproved the Oklahoma and Texas regional haze SIPs for the first planning period, and issued partial FIPs for each of those states (the FIP required controls only on TX sources). This was a not a decision on the merits of EPA's action; that litigation remains ongoing. On December 2, 2016, EPA requested a remand of the FIP with the case held in abeyance in the Fifth Circuit.
- EPA is currently in the process of revising federal regulations governing the second planning period obligations. The current final rule which is at OMB for review, identifies July 2021 as the due date for plans for the second planning period which will cover through 2028

KEY EXTERNAL STAKEHOLDERS:

☐Congress ☒Industry ☒States ☒Tribes ☐Media ☒Other Federal Agency ☒NGO

☐Other (name of stakeholder) _____ _____ _____

Ex. 5 - Deliberative Process

REGIONAL HAZE PROGRAM

Ex. 5 - Deliberative Process

MOVING FORWARD:

EPA is expecting to finalize the regional haze rule revisions in December 2016 following completion of the interagency review process. EPA also expects to continue to move forward with finalizing the guidance document to support technical analyses during the second planning period. EPA continues to respond as appropriate and necessary to ongoing regional haze related litigation. Lastly, EPA will continue with actions regarding state plans for the first planning period.

LEAD OFFICE/REGION: OTHER KEY OFFICES/REGIONS:

Office of Air and Radiation, Office of Air Quality Planning and Standards, Air Quality Policy Division

Key Regional Offices include: EPA Regions 2 and 8 serve as coordinators among the EPA Regions on Regional Haze. Regions 6, 7 and 9 have significant upcoming actions on Regional Haze.

To: Steib, Clovis[steib.clovis@epa.gov]
From: Kordzi, Joe
Sent: Wed 2/15/2017 1:54:39 PM
Subject: RE: FYI News Article (In case you hadn't already seen it...)

Thanks (I think).

From: Steib, Clovis
Sent: Wednesday, February 15, 2017 7:53 AM
To: Kordzi, Joe <Kordzi.Joe@epa.gov>; Snyder, Erik <snyder.erik@epa.gov>; Huser, Jennifer <Huser.Jennifer@epa.gov>; Medina, Dayana <Medina.Dayana@epa.gov>
Subject: FYI News Article (In case you hadn't already seen it...)

Pruitt Seen As Boon For Utilities Impacted By EPA Haze Rule.

Greenwire (2/14) report that Scott Pruitt views on the EPA's regional haze program "remain unchanged." As EPA administrator, Pruitt "could offer relief to power companies that cumulatively face billions of dollars in cleanups for older coal-fired plants." PacifiCorp is suing to void an EPA plan for new curbs on nitrogen oxides at two Utah coal plants in favor of a less stringent state alternative. Arkansas AG Leslie Rutledge and Entergy Arkansas are suing to block EPA pollution controls at several plants estimated to cost $1 billion. Rutledge voiced hope that Pruitt would scrap the EPA's blueprint. "The stakes may be highest in Texas," where controls could cost a projected $2 billion. The Competitive Enterprise Institute's William Yeatman called it "inconceivable" that Pruitt would allocate resources toward an EPA plan for Texas "that makes no sense."

Clovis Steib, III
US EPA Region 6
Phone: (214) 665-7566
Fax: (214) 665-6762

To: Feldman, Michael[Feldman.Michael@epa.gov]; Snyder, Erik[snyder.erik@epa.gov]; Tomasovic, Brian[Tomasovic.Brian@epa.gov]
Bcc: jkordzi@twc.com[jkordzi@twc.com]; skordzi@gmail.com[skordzi@gmail.com]
From: Kordzi, Joe
Sent: Tue 2/14/2017 7:33:21 PM
Subject: AIR POLLUTION: Pruitt seen as boon for utilities hit by EPA haze rule -- Tuesday, February 14, 2017

http://www.eenews.net/greenwire/stories/1060050019/feed

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AIR POLLUTION

Pruitt seen as boon for utilities hit by EPA haze rule

Sean Reilly, E&E News reporter

Published: Tuesday, February 14, 2017

Emissions at the Four Corners Power Plant, once the nation's biggest source of nitrogen oxide, are plummeting because of regional haze regulations. Photo courtesy of Arizona Public Service Co.

Scott Pruitt hadn't long been Oklahoma's attorney general in 2011 when he sallied into his first public clash with U.S. EPA. The target: a proposed clampdown on power plant pollution clouding views at wilderness areas in three states.

It turned into a testy legal showdown that fizzled three years later when the Supreme Court refused to hear Oklahoma's appeal of a lower-court ruling in EPA's favor. But with Pruitt, a Republican, now poised to lead the agency he has often sued, his views on what's known as the regional haze program remain unchanged, recent statements suggest.

As EPA administrator, he could offer relief to power companies that cumulatively face billions of dollars in cleanups for older coal-fired plants.

CONTINUING COVERAGE

POWER SHIFT

E&E News' ongoing coverage of the new administration and the changes taking place on Capitol Hill. Click here to view the continuing coverage.

"We're very concerned," said Michael Shea, senior policy associate at HEAL Utah, an environmental group backing EPA's plan to require two 1970s-era plants in the state to install new curbs on nitrogen oxides (NOx). The plants' owner, PacifiCorp, pegs the price tag at $700 million; together with Utah state officials, the firm is suing to void the federal plan in favor of a less stringent state alternative. Should Pruitt win confirmation to head EPA, he could pull the agency out of the lawsuit or roll back enforcement of the plan, Shea said.

Meanwhile, utilities and their allies in state government are buoyed by the possibility of a federal about-face. In a statement, Utah Attorney General Sean Reyes (R) said he hoped EPA would reconsider and accept the state plan.

It is a similar story in Arkansas, where Attorney General Leslie Rutledge (R) and Entergy Arkansas are suing to block EPA from requiring new pollution controls at several plants with total costs estimated at $1 billion or more. Last week, Rutledge asked the 8th U.S. Circuit Court of Appeals to stay the EPA blueprint. In a news release, she voiced hope that Pruitt would scrap it (*E&ENews PM*, Feb. 8).

The stakes may be highest in Texas, where state leaders and power companies have already forced EPA to retreat on a haze plan that would force seven coal-fired plants to install or upgrade sulfur dioxide scrubbers.

No state's power sector spews more sulfur dioxide (SO2) than that of Texas, which in 2015 released some 260,000 tons of the acrid pollutant, according to the latest official figures. "The regional haze rule would cut that by more than half," said Dan Cohan, an associate professor of environmental engineering at Rice University, who in an op-ed in *The Hill* dubbed it "the most important pollution rule you've never heard of."

But the Texas plan carries a projected $2 billion price tag. After the 5th U.S. Circuit Court of Appeals froze implementation last July, EPA is now seeking to voluntarily remand the plan but has infuriated state officials by advancing a fresh proposal that would require controls on many of the same plants under another provision of the haze program (*Greenwire*, Dec. 12, 2016).

At the Competitive Enterprise Institute, a conservative think tank deeply critical of EPA's approach, Senior Fellow William Yeatman called it "inconceivable" that Pruitt would allocate resources toward an EPA plan for Texas "that makes no sense."

Enforcement results

The heated polemics are a testament to the belated impact of the regional haze program, created by Congress four decades ago but seriously enforced only in the last few years.

The program's overall purpose is to return pristine views to 156 national parks and wilderness areas — most of them in the West — by 2064.

Lawmakers acted out of alarm that man-made air pollution was besmirching the Grand Canyon and other cherished landmarks; nitrogen oxides and sulfur dioxide are major contributors to the problem. The program has proved to be an unexpectedly powerful backstop for forcing cleanup of older coal-fired plants that had managed to skirt installation of up-to-date pollution control equipment under other EPA programs. The key lever — and the biggest flashpoint — is a requirement that power producers adopt "best available retrofit technology" (BART) for plants that launched operations between 1962 and 1977.

A proposed U.S. EPA cleanup plan for Nebraska's largest power plant, the Gerald Gentleman Station, faces an uncertain future under the Trump administration. Photo by Ammodramus, courtesy of Wikipedia.

Nationally, the haze program's impact is difficult to gauge because EPA leaves implementation up to its regional offices and makes no apparent attempt to keep tabs on either total costs or benefits. But in a 2014 paper, researchers concluded that requirements already in place would slash SO2 emissions from 35 power plants and

other industrial facilities by some 85 percent from a starting figure of 590,000 tons. NOx releases from a slightly larger set of plants would tumble by two-thirds, from 430,000 tons to 130,000 tons, the paper projected. A separate study published the same year found that visibility had improved significantly in many remote parts of the United States since the early 1990s.

At the Four Corners Power Plant in New Mexico, once the nation's single largest source of NOx, regional haze regulations prompted the 2013 retirement of three generating units and requirements for tough new controls on the remaining two.

That work, which carries a projected $630 million price tag, is already under way. Once it's complete, annual NOx emissions, which had run as high as 38,000 tons earlier this decade, are in line to plummet to 3,000 tons, according to Annie DeGraw, a spokeswoman for Arizona Public Service Co., the plant's operator.

More recently, a tentative court settlement with the owners of the Laramie River Station, a 1,710-megawatt plant in Wyoming, could also curb combined NOx and SO2 releases by thousands of tons per year (*Greenwire*, Jan. 5).

And only last month, EPA signed off on a draft haze plan for Nebraska that would require new controls on the Gerald Gentleman Station, the state's largest source of SO2. That proposal is now caught in a broader Trump administration freeze on new regulations. It must still be published in the *Federal Register* and put out for public comment, a step "which could result in revisions, withdrawal or full implementation," David Bryan, a spokesman for EPA's Region 7 office, said in an email.

Fierce opposition

The Senate Environment and Public Works Committee approved Pruitt's nomination earlier this month; the full Senate could vote on it as early as this week.

If confirmed to head EPA, Pruitt would not have unfettered freedom to reverse course. Any attempt to undo haze rules already on the books, for example, would have to go through public notice and comment procedures. Environmentalists are already vowing to fight him every step of the way.

In general, "I think we're most likely to see delays, we'll likely see lower stringency required, and I think we'll likely see cost considerations take a much larger role," said Julie Domike, a former EPA enforcement attorney who is now a partner in the Washington, D.C., office of the firm Haynes and Boone LLP.

The backlash from utilities and elected officials has been fierce. Under the Obama administration, they charged, EPA used the haze program as a pretense for slapping new pollution controls on coal-fired power plants — even if the result was little or no visibility improvement. They also say that federal regulators are sidestepping Congress' intent by repeatedly substituting their own cleanup strategies for state plans.

The Obama EPA had "run roughshod" by imposing 15 regional haze federal implementation plans (FIPs), Yeatman said at a congressional hearing last March. That number far outstripped the number of FIPs employed by the three preceding presidential administrations combined under all facets of the Clean Air Act, he said.

No one from EPA testified at the hearing, held by the House Science, Space and Technology's Environment Subcommittee. In an interview late last year just before stepping down, Janet McCabe, the agency's acting air chief, acknowledged that there were situations "where we just couldn't approve the" state implementation plans.

In some cases, McCabe noted, EPA was under the gun from court-ordered deadlines, but she praised the haze program for delivering a "remarkable" amount of pollution reduction at a reasonable cost.

"That's one of the things that's really notable about it, is that for sources that were uncontrolled, there's available technology, NOx controls and SO2 controls, that are very cost-effective that make a huge difference," McCabe said.

To environmental groups that have repeatedly sued to goad EPA into action, federal intervention is a crucial counterweight to the electric industry's political might.

"In state after state, utilities and operators of larger coal-fired power plants have intimidated and persuaded and sometimes colluded with state regulators," said Al Armendariz, the former head of EPA's Region 6 office in Dallas, which pushed the Oklahoma haze plan. "The result has been that plant owners have been able to go decades without installing modern pollution controls." Armendariz is now with the Sierra Club's Beyond Coal campaign.

Pruitt's fight

At his confirmation hearing last month, Pruitt criticized EPA's handling of the haze program in the context of a broader pattern of trampling on state prerogatives.

"It shows an attitude of indifference," Pruitt said in response to a question from Sen. John Boozman (R-Ark.), "an attitude of trying to be dictatorial in some respects toward the state's role or manipulative of the state's role in a way that's, I think, counterproductive for air quality." He struck a more conciliatory note in replying to follow-up written questions from committee Democrats, saying he would consider all matters "with an open mind."

But Pruitt's pugnacious side was on full display in March 2011. He had been Oklahoma's attorney general for just two months when EPA officials disapproved a state haze plan on the grounds that it didn't do enough to cut SO2 emissions wafting into parts of Oklahoma, Arkansas and Missouri.

"Let the EPA be put on notice, as attorney general, I plan to do all that I can to protect

and preserve the state's authority and responsibility under the Clean Air Act to craft and implement solutions for our state," Pruitt said in a news release.

Three months later, he took those objections into federal court, arguing that the EPA plan could raise power rates for Oklahoma consumers by as much as 20 percent over three years. The suit was the first of many he has brought against the agency; the reams of legal filings furnish a window into the tensions between state and federal regulators about compliance with BART mandates.

The state, in concert with Oklahoma Gas & Electric Co., argued that requiring the company to burn low-sulfur coal was enough. Pruitt also complained that EPA was eviscerating the state's authority and that requiring scrubbers at two OG&E plants would cost more than $1.2 billion.

EPA fired back with a suggestion that the state was credulously accepting inflated cost estimates from OG&E. "Far from the empty, rubber-stamping role" urged by Pruitt, the Clean Air Act affords EPA "a critical oversight" position, agency lawyers wrote in one brief.

When the time came for oral arguments before the 10th U.S. Circuit Court of Appeals, Pruitt personally shouldered the job of presenting the state's case. In a 2-1 decision, the court in 2013 ruled in EPA's favor; the litigation sputtered to an end the next year when the Supreme Court declined to take Pruitt's appeal.

"Oklahoma ratepayers will bear billions of dollars in costs for an onerous federal regional haze plan," he said in a statement at the time.

To date, however, the effect has been limited. OG&E ultimately agreed to install scrubbers on two coal-fired generating units and convert another two to natural gas. The company has also cut its anticipated compliance costs from $1.2 billion to about $700 million.

Because OG&E has not yet sought to recover those expenses through higher rates, there has so far been no effect on electricity prices, Thomas Schroedter, executive director of Oklahoma Industrial Energy Consumers, said in an email this week. For Public Service Co. of Oklahoma, a smaller power producer also covered by the haze plan, rate hikes have averaged about 5.5 percent, Schroedter said.

As attorney general, Pruitt has accepted some $15,000 in campaign contributions from OG&E, according to the National Institute on Money in State Politics, a research clearinghouse. Pruitt was not available for comment, but a Trump administration spokesman said such contributions have never affected his work.

"To suggest otherwise is a politically motivated attack that should not be considered real news," the spokesman, John Konkus said, also by email. "As Mr. Pruitt stated time and again during his confirmation hearing, and as his record indicates, every decision he has made in public life has been based on what is best for the American people."

Reporter Amanda Reilly contributed.

Twitter: @SeanatGreenwire Email: sreilly@eenews.net

To: Marks, Matthew[Marks.Matthew@epa.gov]; Viswanathan, Krishna[Viswanathan.Krishna@epa.gov]; Lee, Anita[Lee.Anita@epa.gov]; Werner, Christopher[Werner.Christopher@epa.gov]; Beaver, Melinda[Beaver.Melinda@epa.gov]; Jones, Rhea[Jones.Rhea@epa.gov]
Cc: McKaughan, Colleen[McKaughan.Colleen@epa.gov]
From: Withey, Charlotte
Sent: Fri 3/17/2017 4:30:54 PM
Subject: RE: quick review of regional haze pager?
Regional Haze Administrator Pager 3_16_17v4 - mcm+ng +mla+cw.docx

Ex. 5 - Deliberative Process

From: Marks, Matthew
Sent: Friday, March 17, 2017 9:28 AM
To: Withey, Charlotte <Withey.Charlotte@epa.gov>; Viswanathan, Krishna <Viswanathan.Krishna@epa.gov>; Lee, Anita <Lee.Anita@epa.gov>; Werner, Christopher <Werner.Christopher@epa.gov>; Beaver, Melinda <Beaver.Melinda@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>
Cc: McKaughan, Colleen <McKaughan.Colleen@epa.gov>
Subject: RE: quick review of regional haze pager?

Ex. 5 - Deliberative Process

From: Withey, Charlotte
Sent: Friday, March 17, 2017 12:18 PM
To: Viswanathan, Krishna <Viswanathan.Krishna@epa.gov>; Lee, Anita <Lee.Anita@epa.gov>; Werner, Christopher <Werner.Christopher@epa.gov>; Beaver, Melinda <Beaver.Melinda@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>
Cc: McKaughan, Colleen <McKaughan.Colleen@epa.gov>; Marks, Matthew <Marks.Matthew@epa.gov>
Subject: RE: quick review of regional haze pager?

I haven't seen Matt's changes. Could someone send me that version?

Otherwise, yes, Anita's correction to the text in red is correct. Thanks!

From: Viswanathan, Krishna
Sent: Friday, March 17, 2017 9:07 AM
To: Lee, Anita <Lee.Anita@epa.gov>; Werner, Christopher <Werner.Christopher@epa.gov>; Beaver, Melinda <Beaver.Melinda@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>
Cc: McKaughan, Colleen <McKaughan.Colleen@epa.gov>; Withey, Charlotte <Withey.Charlotte@epa.gov>
Subject: RE: quick review of regional haze pager?

Please review in context of OGC changes. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Krishna Viswanathan

520.999.7880

From: Lee, Anita
Sent: Friday, March 17, 2017 9:03 AM
To: Werner, Christopher <Werner.Christopher@epa.gov>; Beaver, Melinda <Beaver.Melinda@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>
Cc: McKaughan, Colleen <McKaughan.Colleen@epa.gov>; Withey, Charlotte <Withey.Charlotte@epa.gov>; Viswanathan, Krishna <Viswanathan.Krishna@epa.gov>
Subject: RE: quick review of regional haze pager?

Hi Chris,

I think Charlotte will be logging in a little later today . . . I didn't work on those facilities, but based on Charlotte's comment, I would agree that the text in red that you highlighted needs to be revised. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

But, I think it is best for Charlotte to weigh in – I am just adding my two cents in case you were hoping for a response sooner. =)

From: Werner, Christopher
Sent: Friday, March 17, 2017 6:58 AM
To: Lee, Anita <Lee.Anita@epa.gov>; Beaver, Melinda <Beaver.Melinda@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>
Cc: McKaughan, Colleen <McKaughan.Colleen@epa.gov>; Withey, Charlotte <Withey.Charlotte@epa.gov>; Viswanathan, Krishna <Viswanathan.Krishna@epa.gov>
Subject: RE: quick review of regional haze pager?
Importance: High

Anita,

Thanks so much for these. Charlotte put a comment just above the blue boxes about AZ, but I do not see any changes made to the actual text in the blue boxes (though it's hard to tell because track changes does not work within them). To my eye, it seems like there would be changes needed to the text in the blue boxes, correct? I highlighted the part I think needs to change in red (but there could be more I missed).

Charlotte's comment and current text are below:

Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

Chris Werner
US EPA – Office of Air Quality Planning and Standards

Air Quality Policy Division
(919) 541-5133
werner.christopher@epa.gov

From: Lee, Anita
Sent: Thursday, March 16, 2017 6:07 PM
To: Beaver, Melinda <Beaver.Melinda@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>; Werner, Christopher <Werner.Christopher@epa.gov>
Cc: McKaughan, Colleen <McKaughan.Colleen@epa.gov>; Withey, Charlotte <Withey.Charlotte@epa.gov>; Viswanathan, Krishna <Viswanathan.Krishna@epa.gov>
Subject: FW: quick review of regional haze pager?

Hi all,

The pager looks amazing! Wow!

Charlotte and I suggested some minor revisions to the pager in the AZ and NGS sections. Also, we commented on the 1st version Melinda sent out, but I see that Anna Wood just sent out a revised version and asked for comments on that instead. I skimmed the new version and didn't notice that the R9-specific paragraphs changed, so hopefully you won't mind that we are sending you comments on the older version.

Please let us know if you have any questions about our suggested changes.

Thanks!
Anita

Anita Lee, PhD

Environmental Scientist

US EPA | Region 9 | Air Planning Office | 75 Hawthorne Street (Air-2) | San Francisco, CA 94105

(415) 972-3958

From: Withey, Charlotte
Sent: Thursday, March 16, 2017 2:23 PM
To: Lee, Anita <Lee.Anita@epa.gov>; McKaughan, Colleen <McKaughan.Colleen@epa.gov>
Cc: Viswanathan, Krishna <Viswanathan.Krishna@epa.gov>
Subject: RE: quick review of regional haze pager?

Thanks, Anita! I added edits on the AZ litigation.

From: Lee, Anita
Sent: Thursday, March 16, 2017 1:50 PM
To: McKaughan, Colleen <McKaughan.Colleen@epa.gov>; Withey, Charlotte <Withey.Charlotte@epa.gov>
Cc: Viswanathan, Krishna <Viswanathan.Krishna@epa.gov>
Subject: FW: quick review of regional haze pager?
Importance: High

FYI. There is a write up about AZ litigation that you will both want to review.

I made some revisions to the NGS write up.

From: Beaver, Melinda
Sent: Thursday, March 16, 2017 1:31 PM
To: Greenglass, Nora <Greenglass.Nora@epa.gov>; Anderson, Lea <anderson.lea@epa.gov>; Marks, Matthew <Marks.Matthew@epa.gov>; Laumann, Sara <Laumann.Sara@epa.gov>; Fallon, Gail <fallon.gail@epa.gov>; Feldman, Michael <Feldman.Michael@epa.gov>; Medina, Dayana <Medina.Dayana@epa.gov>; Algoe-Eakin, Amy <Algoe-Eakin.Amy@epa.gov>; Notarianni, Michele <Notarianni.Michele@epa.gov>; Worstell, Aaron <Worstell.Aaron@epa.gov>; Dobrahner, Jaslyn <Dobrahner.Jaslyn@epa.gov>; Khadr, Asrah <Khadr.Asrah@epa.gov>; Lee, Anita <Lee.Anita@epa.gov>; Viswanathan, Krishna <Viswanathan.Krishna@epa.gov>; Rosenthal, Steven <rosenthal.steven@epa.gov>; Kelly, Bob <Kelly.Bob@epa.gov>; Huser, Jennifer <Huser.Jennifer@epa.gov>
Cc: Werner, Christopher <Werner.Christopher@epa.gov>; Keas, Ashley <keas.ashley@epa.gov>; Lorang, Phil <Lorang.Phil@epa.gov>; Jones, Rhea <Jones.Rhea@epa.gov>; Kornylak, Vera S. <Kornylak.Vera@epa.gov>; Zenick, Elliott <Zenick.Elliott@epa.gov>
Subject: quick review of regional haze pager?

All,

Many of you know we've been working on a document for Agency leadership that explains ongoing regional haze actions that need attention. I've attached the current version of this document for your quick review. I can offer until 11:00am EDT Friday (tomorrow) for you to provide feedback. Please respond to Chris Werner (werner.christopher@epa.gov) and Rhea Jones (jones.rhea@epa.gov) with your suggestions (I'm out of the office tomorrow).

We know these actions are complex and difficult to present in this 3 sentence/question format, but this is the amount and level of information we have been directed to include at this time. We won't be able to accommodate requests to add lots of information, but please let us know if something essential is missing (or incorrect).

Also, please send this to others in your office that may need to take a look.

Thanks for all your help on this so far, and thanks in advance for your quick review,

Melinda

919-541-1062

To: Anderson, Lea[anderson.lea@epa.gov]; Marks, Matthew[Marks.Matthew@epa.gov]
From: Stoltzfus, Robert
Sent: Mon 2/6/2017 8:41:31 PM
Subject: RE: Regional Haze - Cost of SO2 Controls

Very helpful. Thanks again.

J. Robert Stoltzfus / US EPA, Region III / Office of Regional Counsel / Mail Code 3RC10 / 1650 Arch Street, Philadelphia, PA 19103 / 215-814-2695 / stoltzfus.robert@epa.gov

From: Anderson, Lea
Sent: Monday, February 06, 2017 2:30 PM
To: Stoltzfus, Robert <Stoltzfus.Robert@epa.gov>; Marks, Matthew <Marks.Matthew@epa.gov>
Subject: Re: Regional Haze - Cost of SO2 Controls

It sounds as though the SIP/FIP action that R6 is working on might be somewhat analogous Ex. 5 - Deliberative Process -- Attorney Client

Ex. 5 - Deliberative Process -- Attorney Client

From: Stoltzfus, Robert
Sent: Monday, February 6, 2017 12:44 PM
To: Anderson, Lea; Marks, Matthew
Subject: RE: Regional Haze - Cost of SO2 Controls

Thanks Lea.

We are dealing with a small coke plant in Pennsylvania. As with all coke plants, it has an adjacent by-products/desulfurization plant to help clean the coke oven gas (COG). Ex. 5 - Deliberative Process -- Attorney Client

Ex. 5 - Deliberative Process -- Attorney Client

Ex. 5 - Deliberative Process -- Attorney Client

Bob

J. Robert Stoltzfus / US EPA, Region III / Office of Regional Counsel / Mail Code 3RC10 / 1650 Arch Street, Philadelphia, PA 19103 / 215-814-2695 / stoltzfus.robert@epa.gov

From: Anderson, Lea
Sent: Monday, February 06, 2017 10:15 AM
To: Marks, Matthew <Marks.Matthew@epa.gov>; Stoltzfus, Robert <Stoltzfus.Robert@epa.gov>
Subject: Re: Regional Haze - Cost of SO2 Controls

Ex. 5 - Deliberative Process -- Attorney Client

What kind of facility is at issue?

From: Marks, Matthew
Sent: Friday, February 3, 2017 3:32 PM
To: Stoltzfus, Robert; Anderson, Lea
Subject: Re: Regional Haze - Cost of SO2 Controls

Ex. 5 - Deliberative Process -- Attorney Client

Ex. 5 - Deliberative Process -- Attorney Client

From: Stoltzfus, Robert
Sent: Friday, February 3, 2017 3:29:22 PM
To: Anderson, Lea; Marks, Matthew
Subject: FW: Regional Haze - Cost of SO2 Controls

Ex. 5 - Deliberative Process -- Attorney Client

Thanks again for your assistance.

Bob

J. Robert Stoltzfus / US EPA, Region III / Office of Regional Counsel / Mail Code 3RC10 / 1650 Arch Street, Philadelphia, PA 19103 / 215-814-2695 / stoltzfus.robert@epa.gov

From: Anderson, Lea
Sent: Friday, February 03, 2017 11:04 AM
To: Marks, Matthew <Marks.Matthew@epa.gov>; Stoltzfus, Robert <Stoltzfus.Robert@epa.gov>
Subject: Re: Regional Haze - Cost of SO2 Controls

Ex. 5 - Deliberative Process -- Attorney Client

Ex. 5 - Deliberative Process -- Attorney Client

From: Marks, Matthew
Sent: Friday, February 3, 2017 9:48 AM
To: Stoltzfus, Robert; Anderson, Lea
Subject: Re: Regional Haze - Cost of SO2 Controls

Hi Bob,

This recent notice should help you out. **Ex. 5 - Deliberative Process -- Attorney Client**

Ex. 5 - Deliberative Process -- Attorney Client

Matt

https://www.federalregister.gov/documents/2017/01/04/2016-30713/promulgation-of-air-quality-implementation-plans-state-of-texas-regional-haze-and-interstate

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From: Stoltzfus, Robert
Sent: Friday, February 3, 2017 9:45:47 AM
To: Anderson, Lea; Marks, Matthew
Subject: Regional Haze - Cost of SO2 Controls

Lea and Matt,

Could either of you point me in the right direction to allow me to get a feel for what the agency has accepted in the way of the cost to control SO2?

My question arises in an enforcement matter and is not related to Regional Haze. However, I am trying to gain some understanding of what EPA has found acceptable on a dollar/ton basis in other contexts. I started to review various Regional Haze Plans and FIPs but soon realized there are some nuances here and thought it would help to get a quick overview from you. I know that all of these are case-by-case determinations but can you point me to one that would best illustrate the agency's current view on the matter. Thanks.

Bob

J. Robert Stoltzfus / US EPA, Region III / Office of Regional Counsel / Mail Code 3RC10 / 1650 Arch Street, Philadelphia, PA 19103 / 215-814-2695 / stoltzfus.robert@epa.gov

To: OGC ARLO[OGC_ARLO@epa.gov]
Cc: Hooks, Samantha[hooks.samantha@epa.gov]
From: Graham, Cheryl
Sent: Mon 1/30/2017 7:02:45 PM
Subject: Reg Review is scheduled for 2:30 pm today in room 4045 (final agenda attached)
17-01-30 agenda.docx

Conference Call Number: **Ex. 6 - Personal Privacy**

Cheryl R. Graham

To: Marks, Matthew[Marks.Matthew@epa.gov]
From: Zenick, Elliott
Sent: Thur 1/26/2017 1:45:16 PM
Subject: Fw: 1/25 reg review agenda for your review
17-01-23 agenda.docx

From: Graham, Cheryl
Sent: Tuesday, January 24, 2017 11:29 PM
To: OGC ARLO MGMT; McConkey, Diane
Subject: 1/25 reg review agenda for your review

Cheryl R. Graham

Cheryl R. Graham

OGC/ARLO

(202) 564-5473

To: Adair, Jocelyn[Adair.Jocelyn@epa.gov]; Allnutt, David[Allnutt.David@epa.gov]; Anderson, Lea[anderson.lea@epa.gov]; Anderson, Steve[Anderson.Steve@epa.gov]; Aranda, Amber[aranda.amber@epa.gov]; Averback, Jonathan[Averback.Jonathan@epa.gov]; Belser, Evan[Belser.Evan@epa.gov]; Bianco, Karen[Bianco.Karen@epa.gov]; Blake, Wendy[Blake.Wendy@epa.gov]; Bogoshian, Matthew[Bogoshian.Matt@epa.gov]; Bond, Alexander[Bond.Alexander@epa.gov]; Branning, Amy[Branning.Amy@epa.gov]; Bunker, Byron[bunker.byron@epa.gov]; Caballero, Kathryn[Caballero.Kathryn@epa.gov]; Carrillo, Andrea[Carrillo.Andrea@epa.gov]; Chapman, Apple[Chapman.Apple@epa.gov]; Charlton, Tom[Charlton.Tom@epa.gov]; Choi, Jake[Choi.Jake@epa.gov]; Conger, Nick[Conger.Nick@epa.gov]; Conrad, Daniel[conrad.daniel@epa.gov]; Cozad, David[Cozad.David@epa.gov]; Crum, Lynda[Crum.Lynda@epa.gov]; Crystal, Roy[crystal.roy@epa.gov]; Davis, Julian[davis.julian@epa.gov]; Dickinson, David[Dickinson.David@epa.gov]; Dierker, Carl[Dierker.Carl@epa.gov]; Dolph, Becky[Dolph.Becky@epa.gov]; Doster, Brian[Doster.Brian@epa.gov]; Dubey, Susmita[dubey.susmita@epa.gov]; Dubois, Roland[Dubois.Roland@epa.gov]; Firestine, Natalie[firestine.natalie@epa.gov]; Frey, Bert[frey.bertram@epa.gov]; Froikin, Sara[Froikin.Sara@epa.gov]; Giles-AA, Cynthia[Giles-AA.Cynthia@epa.gov]; Graham, Cheryl[Graham.Cheryl@epa.gov]; Greenglass, Nora[Greenglass.Nora@epa.gov]; Harrison, Ben[Harrison.Ben@epa.gov]; Hindin, David[Hindin.David@epa.gov]; Hoffman, Howard[hoffman.howard@epa.gov]; Hogan, Stephanie[Hogan.Stephanie@epa.gov]; Holmes, Carol[Holmes.Carol@epa.gov]; Igoe, Sheila[Igoe.Sheila@epa.gov]; Jordan, Deborah[Jordan.Deborah@epa.gov]; Jordan, Scott[Jordan.Scott@epa.gov]; Kaminer, Joan[Kaminer.Joan@epa.gov]; Kane, Eleanor[kane.eleanor@epa.gov]; Kaplan, Robert[kaplan.robert@epa.gov]; Kataoka, Mark[Kataoka.Mark@epa.gov]; Klepp, Robert[Klepp.Robert@epa.gov]; Knapp, Kristien[Knapp.Kristien@epa.gov]; Krallman, John[krallman.john@epa.gov]; Kryman, Matthew[Kryman.Matthew@epa.gov]; Kulschinsky, Edward[Kulschinsky.Edward@epa.gov]; Lee, Michael[lee.michaelg@epa.gov]; Li, Ryland (Shengzhi)[Li.Ryland@epa.gov]; Lovett, Lauren[Lovett.Lauren@epa.gov]; Mackey, Cyndy[Mackey.Cyndy@epa.gov]; Manners, Mary[manners.mary@epa.gov]; Marks, Matthew[Marks.Matthew@epa.gov]; Mastro, Donna[Mastro.Donna@epa.gov]; Matthews, Julie[Matthews.Juliane@epa.gov]; McConkey, Diane[Mcconkey.Diane@epa.gov]; Mclean, Kevin[Mclean.Kevin@epa.gov]; Moore, Bruce[Moore.Bruce@epa.gov]; Moore, Megan[moore.megan@epa.gov]; Morgan, Jeanette[Morgan.Jeanette@epa.gov]; Muller, Sheldon[Muller.Sheldon@epa.gov]; Nguyen, DucH[Nguyen.DucH@epa.gov]; Nguyen, Quoc[Nguyen.Quoc@epa.gov]; Niebling, William[Niebling.William@epa.gov]; Odendahl, Steve[Odendahl.Steve@epa.gov]; OGC FEAT[OGC_FEAT@epa.gov]; Okoye, Winifred[Okoye.Winifred@epa.gov]; Orlin, David[Orlin.David@epa.gov]; Palmer, Karen[Palmer.Karen@epa.gov]; Pastorkovich, Anne-Marie[Pastorkovich.Anne-Marie@epa.gov]; Pilchen, Zach[Pilchen.Zach@epa.gov]; Portmess, Jessica[Portmess.Jessica@epa.gov]; Reid, Lauren[Reid.Lauren@epa.gov]; Roberts, Martha[Roberts.Martha@epa.gov]; Roder, Aileen[Roder.Aileen@epa.gov]; Rodman, Sonja[Rodman.Sonja@epa.gov]; Rowland, John[Rowland.John@epa.gov]; Schaaf, Eric[Schaaf.Eric@epa.gov]; Schmidt, Lorie[Schmidt.Lorie@epa.gov]; Schramm, Daniel[Schramm.Daniel@epa.gov]; Seidman, Emily[seidman.emily@epa.gov]; Senn, John[Senn.John@epa.gov]; Shenkman, Ethan[Shenkman.Ethan@epa.gov]; Silverman, Steven[silverman.steven@epa.gov]; Skinner-Thompson, Jonathan[Skinner-Thompson.Jonathan@epa.gov]; Smith, Kristi[Smith.Kristi@epa.gov]; Snyder, Doug[Snyder.Doug@epa.gov]; Spina, Providence[Spina.Providence@epa.gov]; Srinivasan, Gautam[Srinivasan.Gautam@epa.gov]; Stahle, Susan[Stahle.Susan@epa.gov]; Starfield, Lawrence[Starfield.Lawrence@epa.gov]; Stern, Allyn[Stern.Allyn@epa.gov]; Sullivan, Tim[Sullivan.Tim@epa.gov]; Thompson, Christopher[Thompson.Christopher@epa.gov]; Thrift, Mike[thrift.mike@epa.gov]; Tierney, Jan[tierney.jan@epa.gov]; Ting, Kaytrue[Ting.Kaytrue@epa.gov]; Tozzi, Lauren[Tozzi.Lauren@epa.gov]; Tsirigotis, Peter[Tsirigotis.Peter@epa.gov]; Vergeront, Julie[Vergeront.Julie@epa.gov]; Versace, Paul[Versace.Paul@epa.gov]; Vetter, Rick[Vetter.Rick@epa.gov]; Vijayan, Abi[Vijayan.Abi@epa.gov]; Walker, Denise[Walker.Denise@epa.gov]; Walker, Mike[Walker.Mike@epa.gov]; Ward, W. Robert[Ward.Robert@epa.gov]; Werner, Jacqueline[Werner.Jacqueline@epa.gov]; Wilcox, Geoffrey[wilcox.geoffrey@epa.gov]; Williams, Brent[Williams.Brent@epa.gov]; Williams,

Christopher[Williams.Christopher@epa.gov]; Williams, Melina[Williams.Melina@epa.gov]; Williamson, Timothy[Williamson.Tim@epa.gov]; Wills, Jennifer[Wills.Jennifer@epa.gov]; Zenick, Elliott[Zenick.Elliott@epa.gov]
From: OGCLibrary
Sent: Fri 1/6/2017 3:17:31 PM
Subject: Air & Radiation Law News for January 6, 2016

Air & Radiation Law News for January 6, 2016

Bloomberg BNA Daily Environment Report™

NEWS

Air Pollution

After Deadline Extension, Cleveland Meets Ozone Pollution Goal

The Cleveland area has successfully brought its levels of ozone pollution below a federal threshold, according to the Environmental Protection Agency, allowing the city to avoid taking mandatory anti-pollution measures....

Air Pollution

Drivers Get Cleaner Air, Added Costs as Taxes, Premium Gas Rise

For BMW and Audi drivers, the start of 2017 brings both good news and bad....

Air Pollution

Ozone Rule Opponents See Potential Congressional, EPA Action

Opponents of the 2015 ozone standards see potential avenues for Congress and Donald Trump's Environmental Protection Agency to address compliance concerns, but any effort to roll back or delay implementation of the rule will face...

Congress

Meet the Newest Republicans on the House Energy Committee

At least one of the four Republicans joining the House Energy and Commerce Committee this session believes that climate change is real and needs to be addressed....

Congress

New Senate Chairman Vows 'Fundamental Shift' on Environment

The Wyoming Republican who is taking the gavel of the Senate Environment and Public Works Committee is looking to make "a fundamental shift" away from the Environmental Protection Agency and other regulations that he argues have...

Energy

Coal for Power to Soar If Trump Axes Obama's Key Energy Plan

Donald Trump's promise to roll back the Obama administration's signature energy initiative would boost the amount of electricity from coal in 2040 by about 49 percent and carbon dioxide emissions from power generation...

Energy

Pakistan Gets $690 Million in Loans to Expand Tarbela Dam

Pakistan is receiving $690 million in loans to expand a 1.41 gigawatt dam that will ease the persistent blackouts impacting the south Asian country....

Energy

U.S. Set to Be Net Energy Exporter as Renewables Ease Oil Use

As the rise of renewables helps keep American demand for gasoline and other petroleum products below a 2005 peak, the U.S. is set to become a net energy exporter for the first time since the 1960s in the next decade....

EPA

EPA Nominee Poses No Threat to Biofuel Program: Republicans

The likely next Environmental Protection Agency administrator, Oklahoma Attorney General Scott Pruitt, will ensure the agency follows statutory biofuel mandates outlined in the renewable fuel standard, despite a track record of criticizing...

Natural Gas

Natural Gas Facilities to Publicly Report Toxics Under New Rule

The Environmental Protection Agency is taking a step to tighten disclosure requirements for natural gas processing facilities, issuing a proposal to require companies to report their chemical data to the public....

Renewable Energy

German Wind Power Hits Record, Forces Grids to Cut Off Turbines

German wind turbines produced more than 35 gigawatts of electricity for the first time, flooding the nation's grids with so much power that some turbines had to be shut down, according to data from the nation's four grid companies....

Renewable Energy

Integration of Renewables Into the Grid Uncertain Under Trump

Attorneys and energy policy professionals tracking the Federal Energy Regulatory Commission will be waiting to see if the incoming Trump administration continues current progress on integrating renewables and battery storage into the...

INSIDEEPA.COM
an online news service from the publishers of Inside EPA

D.C. Circuit Reinstates, Remands EPA 'Major' Boiler Air Toxics Standards

The U.S. Court of Appeals for the District of Columbia Circuit is granting requests from EPA and environmentalists to reinstate air toxics limits for large "major source" industrial, commercial and institutional boilers that the court vacated in July, remanding the limits to the agency so that it can rework them to address their legal flaws.

• EPA, Coal Firms Fight Environmentalists' Bid For Role In Air Rule 'Jobs' Suit

EPA and coal firms are fighting environmentalists' request to intervene on the agency's behalf in an ongoing suit that seeks to force EPA to review the impacts that Clean Air Act rules have had on coal industry jobs, saying the advocates' fear that the Trump administration will drop EPA's opposition to the case is too speculative.

• EPA Refuses To Reconsider Aircraft GHG Finding, Creating Test For Trump

EPA is refusing agricultural groups' petition to reconsider its greenhouse gas (GHG) endangerment finding for aircraft, which could allow the group's lawsuit over the finding to move forward -- creating a test for how the incoming Trump administration will address GHGs from aircraft and emissions associated with biofuels derived from crops.

• Sources Predict Limited CRA Role In Blocking Climate, Environmental Rules

Capitol Hill lawmakers' use of the Congressional Review Act (CRA) to scuttle climate and other environmental rules might be more limited than initial rhetoric by critics suggests, due to the statute's procedural limitations and a likely crowded legislative agenda in 2017, according to former Hill staffers and other observers.

- **CLF's Exxon Suit Tees Up Ruling On Current Climate Effects, Permit Plan**

Environmentalists are asking a federal judge to rule that recent severe storms and floods are direct effects of climate change, and thus must be part of permit compliance plans at ExxonMobil facilities, hoping to win a novel decision that climate change is not a speculative threat but a concrete one while highlighting charges that the company has long known of the risks but failed to act.

Pledging To Remain In Legal Defense, States & Utilities Support EPA's NSPS

A coalition of states, major environmental groups and several low-carbon utilities are offering their legal defense of EPA's greenhouse gas (GHG) standards for new power plants, as such groups are poised to take a much more significant role in litigation over the regulation if the incoming Trump administration drops its legal defense of the rule.

Greenwire

AIR POLLUTION

Wyo. plant operator would spend $350M in proposed haze deal

Sean Reilly, E&E News reporter

Published: Thursday, January 5, 2017

A Wyoming coal-fired power plant would have to slash emissions of nitrogen oxides under a proposal aimed at ending part of a three-year court clash over the scope of a U.S. EPA crackdown on haze-forming air pollution.

The proposed agreement, quietly released for public comment last week, calls on Basin Electric Power Cooperative to install new pollution controls on all three generating units of its 1,710-megawatt Laramie River Station over the next 2 ½ years.

The company would have to have selective non-catalytic reduction in place on two units by the end of next year, with installation of more costly selective catalytic reduction (SCR) on a third required by July 2019.

Reached through mediation, the proposal represents a compromise in the co-op's favor. In its regional haze rule for Wyoming published in early 2014, EPA had wanted SCR on all three units.

Basin Electric filed suit with the 10th U.S. Circuit Court of Appeals in 2014, alleging in one filing that EPA was trying to impose expensive technology for little benefit and without meaningful explanation.

The settlement, which carries an estimated $350 million price tag, "will both improve the environment and help ensure the long-term operation of the Laramie River Station, which employs more than 330 individuals," Basin Electric spokeswoman Mary Miller said in an email yesterday.

The North Dakota-based co-op shares ownership of the power plant with five regional partners under the umbrella of the Missouri Basin Power Project. The co-op board had already approved the SCR project last year — well before the proposed settlement — with construction scheduled to start this April, Miller said.

While the southeastern Wyoming facility is fully equipped with sulfur dioxide scrubbers, the proposed settlement also "memorializes, and would make enforceable, SO2 emission reductions that have been realized over the last several years," EPA Region 8 spokesman Andrew Mutter said in a separate email.

Coupled with other controls, the proposed plan would cut annual releases of nitrogen oxides (NOx) and SO2 by some 12,000 and 2,100 tons, respectively, in comparison with a 2001-03 baseline, according to EPA projections. The potential impact relative to more recent emission levels was not immediately clear.

Federal regulators had put the 2014 rule in place after partially disapproving a state strategy on the grounds that it fell short of the requirements of the haze program, created by Congress with a goal of cleaning up the air around the Grand Canyon and other national parks and wilderness areas.

Assuming that the Basin Electric agreement becomes final after the 30-day public comment period ends, Wyoming will have a year to incorporate the terms into a revised state implementation plan. A corresponding EPA rulemaking will then follow.

But the settlement would do nothing to end two related legal challenges pending before the 10th Circuit, one brought by PacifiCorp, the Oregon-based power producer that also has Wyoming plants covered by the EPA haze rule, and the other by conservation groups represented by Earthjustice.

PacifiCorp alleges that EPA illegally overrode the state's judgment of the NOx controls needed for its 335-MW Wyodak facility in northeast Wyoming; among other concerns, the Powder River Basin Resource Council and the other conservation groups say that EPA should have imposed new emission restrictions on the state's oil and gas industry. Nitrogen oxides contribute to both the formation of smog and particle pollution.

Another challenger, effectively siding with the power industry, is Wyoming. In her email yesterday, Basin Electric's Miller credited Gov. Matt Mead (R) for helping to pull off the newly released deal. "From the beginning, Gov. Mead has diligently fought the EPA," she said, "leading to this proposed settlement, a victory for both [the Missouri Basin Power Project] and the State of Wyoming."

The haze program, which dates to 1999 in its current form, has a goal of restoring natural visibility to 156 national parks and wilderness areas by 2064. The program has led to a string of legal battles, with states repeatedly accusing EPA officials of overstepping their authority to crack down on coal-fired power plants. To environmentalists allied with the federal agency, the bigger problem is that state regulators are skittish about taking on politically influential utilities.

The acrimony may have been especially sharp in Wyoming, which typically accounts for around 40 percent of the nation's coal production. As part of their campaign against the haze rule, PacifiCorp, Basin Electric and other players in the state's power industry several years ago created a website — since taken down — with the address www.stopEPAWY.com.

All the subsequent lawsuits have been consolidated, with a partial stay of the rule in effect since September 2014. While the case has been briefed, oral arguments haven't been held.

One holdup has been the slow pace of settlement talks between EPA and Basin Electric.

In late 2015, conservation groups sought to proceed separately with their suit, saying that the negotiations had already dragged on months longer than first expected. That bid was opposed by the other parties, and the court denied it last January. There has been little substantive action since, filings indicate.

OBITUARY

Former DOE general counsel dies

Published: Thursday, January 5, 2017

Robert Nordhaus, former general counsel at the Department of Energy under President Clinton, died on Christmas Eve after a battle with prostate cancer that lasted over five years.

Nordhaus, 79, was also a member of the Energy Policy and Planning Office under President Carter and served as assistant administrator of the Federal Energy Administration.

"My dad had a very dry, sly wit, and he was a slow, deliberative talker," said Ted Nordhaus, executive director of the Breakthrough Institute, an energy and environmental think tank.

Robert Nordhaus helped write much of the groundbreaking federal energy legislation that came after the 1973 Arab oil embargo as a member of the House Office of the Legislative Counsel and then as counsel to the House Commerce Committee.

"He was also a great legal mind," said Ted Nordhaus, "but was not a set-your-hair-on-fire environmentalist" (Rick Nathanson, *Albuquerque Journal*, Jan. 5). — **CS**

ETHANOL

EPA aims to ban Genscape from verifying biofuel credits

Published: Thursday, January 5, 2017

U.S. EPA is seeking to prevent Genscape Inc. from verifying biofuel compliance credits.

Regulators say Genscape did not detect a massive fraud scheme by companies it oversaw. Genscape, a major player in the energy industry, has 60 days to fight EPA's announcement.

The company accepted millions of renewable fuel compliance credits in 2013 and 2014 submitted by two companies, Gen-X Energy Group and Southern Resources and Commodities (*Greenwire*, Nov. 8, 2016).

The announcement will likely intensify calls to change U.S. biofuel initiatives. A vocal critic, Carl Icahn, is a special adviser to President-elect Donald Trump.

Domestic refineries must blend biofuels like ethanol into gasoline or buy credits called Renewable Identification Numbers from biofuel producers. Gas refiners say the plan hurts business, while supporters point to rising renewable fuel use in the United States (Renshaw/Prentice, Reuters, Jan. 4). — **NB**

NUCLEAR WASTE

DOE repository reopens after 3-year closure

Published: Thursday, January 5, 2017

The Department of Energy began shuttling drums into the nation's only subterranean nuclear waste vault yesterday for the first time in almost three years.

DOE's Waste Isolation Pilot Plant opened in 1999 near Carlsbad, N.M., in order to contain spent nuclear material from weapons testing inside salt caves. But a canister of waste ruptured in 2014, endangering over 20 workers and forcing the site to close.

Last month, New Mexico greenlighted the reopening of the facility after state inspectors indicated it was safe (*Greenwire*, Dec. 23, 2016).

"It went great," said Rick Fuentes, president of the local United Steelworkers chapter and a waste handler himself. "We're excited to be back to work."

Between 20 and 25 workers equipped with respirators and protective gear unloaded two pallets of low-level radioactive material yesterday.

WIPP has not yet received any shipments of new waste. The materials hauled underground were being stored temporarily on the surface.

Among the waste WIPP receives are debris, rags, clothing, soil and tools contaminated by radiation from various nuclear testing sites. The facility does not hold spent nuclear fuel from power plants.

"It's the day we've all been working for," said Phil Breidenbach, president of Nuclear Waste Partnership LLC, a private contractor that runs the site (Maddy Hayden, *Knoxville News Sentinel*, Jan. 4). — **GD**

ENERGY EFFICIENCY

House GOP bill would repeal federal appliance standards

Christa Marshall, E&E News reporter

Published: Thursday, January 5, 2017

Rep. Michael Burgess (R-Texas) introduced a bill yesterday to repeal federal energy efficiency standards.

The "Energy Efficiency Free Market Act of 2017" would prohibit state or federal agencies from adopting or implementing "any requirement to comply with a standard for energy conservation or water efficiency with respect to a product." The legislation, H.R. 117, would repeal portions of the Energy Policy and Conservation Act to block rules on a wide variety of appliances.

Rep. Michael Burgess (R-Texas). Photo courtesy of Wikipedia.

Federal efficiency standards, which were a priority of the Obama administration under its broader climate plan, face an uncertain future under President-elect Donald Trump. He has said little on energy efficiency, but Department of Energy rulemaking has come under attack from some of his advisers and groups with influence on his transition team, including the Heritage Foundation.

Heritage praised a parallel bill from Burgess last year, saying on its website that federal rules on appliances are "micromanagement controls" that encourage corporate welfare and have little environmental impact.

Environmental groups strongly disagree, saying in a report last year that efficiency rulemaking saves consumers billions of dollars a year while slashing emissions (*E&E News PM*, Aug. 4, 2016).

The Obama administration pledged to finalize standards that would cut carbon emissions by 3 billion tons by 2030. As of the new year, it's achieved more than 70 percent of that target through finalized rules.

Burgess has been outspoken against DOE's efficiency standards in the past, saying that the Constitution's commerce clause doesn't permit the federal government to regulate products not posing a risk to human health and safety. He authored a perennial "light bulb rider" blocking efficiency standards that passed the House in 2015 (*Greenwire*, May 1, 2015).

Read today's Climatewire on the web

AN E&E NEWS PUBLICATION

CLIMATEWIRE — Fri., January 6, 2017

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1.CABINET:

Zinke is a 'beast' — with listening skills

Those who worked with Rep. Ryan Zinke, 55, have said his drive and willingness to listen to other opinions are traits that helped his star rise quickly within the Republican Party. After a 23-year career as a U.S. Navy SEAL, and just six years of public service, the fifth-generation Montanan is poised to take control of the sprawling Interior Department and its policies.

TOP STORIES

2.TRANSITION:

Super PAC rules could keep Pruitt's corporate cash flowing

3.CLEAN ENERGY:

Chinese set to dominate international export market

4.EMISSIONS:

Energy-sector CO2 to stagnate without Clean Power Plan — EIA

TRUMP TRANSITION

5.ADVOCACY:

Lawmakers jump on #pollutingPruitt hashtag bandwagon

6.STATE DEPARTMENT:

Kerry memo charges Trump with continuing climate work

7.ADVOCACY:

Enviros mobilize to fight Trump picks, hold 'Day of Denial'

BUSINESS

8.ELECTRIC VEHICLES:

Next Leaf, with Mars Rover technology, will drive itself

9.PEOPLE:

Rockefeller Foundation taps Rajiv Shah as president

10.BUSINESS:

Gigafactory expected to hire 4K people in 2017

IMPACTS AND CONSEQUENCES

11.SPECIES:

Birds might mistime their migrations as the Earth warms

12.ADAPTATION:

Warming tricks plants into blooming during winter

13.AGRICULTURE:

Vintners use technology to protect grape crops

14.FLOODING:

Historic rain in Europe prompts concerns about warming

E&ETV'S THE CUTTING EDGE

15.TRANSITION:

E&E News' Bravender talks confirmation controversies as nominees prep for conflict

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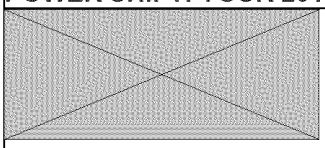
POWER SHIFT: YOUR 2017 TRANSITION GUIDE



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ENERGYWIRE — Fri., January 6, 2017

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1.TRANSITION:

Super PAC rules could keep Pruitt's corporate cash flowing

One of the country's largest coal companies contributed $50,000 to a political action committee supporting Scott Pruitt in August, just as the company and the Oklahoma attorney general prepared for a key court appearance in their challenge to U.S. EPA's sweeping restrictions on power plants. Murray Energy Corp., the Ohio-based mine owner, will be able to make a similar contribution this year, legal experts say, even if the Senate confirms Pruitt, a Republican, to run EPA. The practical impact: Pruitt's Super PAC, Liberty 2.0, can keep raising money from the corporate interests he is charged with regulating.

TOP STORIES

2.TRANSITION:

Tillerson, Perry unwinding lucrative financial conflicts

3.WORKER SAFETY:
Departing OSHA chief leaves robust oil and gas legacy
4.SECURITY:
Trump to inherit the search for a cyberdefense policy
ELECTRICITY
5.RENEWABLES:
As U.S. wavers, China prepares to invest $360B in 4 years
6.LAW:
Utah joins climate fight over leasing
7.POLICY:
Legislators in the South poised to build on gas, large-scale solar
8.MARYLAND:
Lawmakers poised to override energy bill veto
9.TEXAS:
Low-income utility customers face first winter without support
OIL AND GAS
10.ECONOMY:
U.S. on track to be a net energy exporter — EIA
11.PUBLIC LANDS:
Enviros peeved at BLM review of Calif. drilling
12.DAKOTA ACCESS:
N.D. grand jury probes protest injury
13.PIPELINES:
Transco 'gold mine' could trigger Williams takeover bids
14.PRODUCTION:
Rising service costs cut into oil-field profits
E&ETV'S THE CUTTING EDGE
15.TRANSITION:
E&E News' Bravender talks confirmation controversies as nominees prep for conflict

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McCune.Jennifer@epa.gov

To: OGC ARLO[OGC_ARLO@epa.gov]
From: Graham, Cheryl
Sent: Tue 1/3/2017 2:10:52 PM
Subject: Reminder: 01/03/16 Reg Review Agenda Updates
16-01-02 agenda.docx

Attached is the strikeout version of the reg agenda, if you have any additions/deletions please let me know by 11:00 today. Reg Review is scheduled for today at 1:30 in room 4045.

Thank you

Cheryl R. Graham
OGC/ARLO
(202) 564-5473

To: OGC ARLO[OGC_ARLO@epa.gov]
From: Graham, Cheryl
Sent: Thur 12/29/2016 11:56:14 PM
Subject: RE: 01/03/16 Reg Review Agenda Updates
16-01-02 agenda.docx

Cheryl R. Graham

-----Original Message-----
From: Graham, Cheryl
Sent: Thursday, December 29, 2016 6:55 PM
To: OGC ARLO <OGC_ARLO@epa.gov>
Subject: 01/03/16 Reg Review Agenda Updates

Attached is the strikeout version of the reg agenda, if you have any additions/deletions please let me know by 11:00 Tuesday. Reg Review has not yet been rescheduled for the holiday.

Thank you

Cheryl R. Graham
OGC/ARLO
(202) 564-5473

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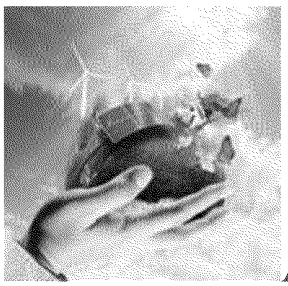
Subject: Air & Radiation Law News for December 16, 2016



Air & Radiation Law News for December 16, 2016

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NEWS

Air Pollution

EPA Moves Ahead With Visibility Program Despite Pruitt's Criticism

The Environmental Protection Agency moved ahead Dec. 15 with revisions to its regional haze regulations, a program that has been the target of litigation and criticism from President-elect Donald Trump's pick to lead the agency. The...

Air Pollution

Existing Waste Incinerators May See 2018 Emissions Deadline

Existing commercial or industrial facilities with solid waste incinerators in certain states could be required to comply with federal particulate matter and other emissions limits by Feb. 7, 2018, under a recently proposed Environmental...

Air Pollution

Ozone Region Expansion Decision Coming in 2017

A decision on whether to expand the Ozone Transport Region, a group of states subject to pollution control and planning requirements to limit ozone precursor emissions, will be made by the Environmental Protection Agency in 2017, under a settlement...

Climate Regulation

EPA Makes Last Defense of Carbon Rule Opposed by Trump Nominee

Carbon dioxide limits for newly constructed power plants fall squarely within the Environmental Protection Agency's Clean Air Act authority, the agency told a federal court, making arguments President-elect Donald Trump's...

Climate Regulation

How Climate Rules Might Fade Away

In February 2009, a month after Barack Obama took office, two academics sat across from each other in the White House mess hall. Over a club sandwich, Michael Greenstone, a White House economist, and Cass Sunstein, Obama's top regulatory...

Emissions Trading

EU Lawmakers Back Carbon Permit Surplus Cuts

The European Union's emissions trading system would be recalibrated to more quickly reduce the surplus of carbon permits after 2020 under a series of revisions the European Parliament's environment committee endorsed Dec....

Energy

Cantwell Vows to Protect Energy Info Arm From Interference

The Energy Information Administration must remain independent and protected from political interference, Sen. Maria Cantwell, the top Democrat on the Senate Energy Committee, said in a Dec. 15 letter to Vice

President-elect Mike Pence....

Energy

FERC Stuck Between Pipelines, Shippers on Tax Allowance Policy

The Federal Energy Regulatory Commission is stuck between the competing interests of oil and gas pipelines and shippers as it reworks a tax policy....

Energy

Few Things Divide Trump, Obama as Much as Our Energy Future

Few things divide Barack Obama and Donald Trump as cleanly as the future of energy. Sitting right on top of that fault line is the Department of Energy and its advanced research projects agency. ...

Energy

Germany Passes Bill Making Nuclear Cleanup Costs Shared

The lower house of Germany's Parliament gave the go-ahead Dec. 15 for a deal that will resolve long-standing uncertainties over the cost and responsibility-splitting for the long-term storage of nuclear waste and dismantling the...

Energy

India Can Stop Building Coal Power Plants by 2022, Advisers Say

India can meet its burgeoning energy needs after 2022 without building new coal-fired power plants, the government's energy advisory body reported in a surprise announcement that noted an increasing reliance on renewables. ...

Energy

Miner Reborn as a Gas Driller Still Waiting to Split From Coal

For all its talk about quitting coal and becoming a pure natural gas explorer, Consol Energy Inc. still has a majority stake in three Pennsylvania mines to get rid of....

Energy

No OPEC Euphoria for Russia as Trumponomics Adds to Volatile Mix

After finding little cheer in OPEC's agreement to cut production, Russia is bracing for what the age of Trump means for oil....

Energy

South Africa OKs Nuclear-Power Procurement Amid Cost Fears

South Africa is moving ahead with a plan to build nuclear power plants that could raise its electricity generation capacity by a quarter, despite opposition from critics who say it will be too expensive....

Energy

Trump's Top Diplomat Would Carry Chinese Baggage From Exxon Days

President-elect Donald Trump's pick for top U.S. diplomat comes with Chinese geopolitical entanglements. In his favor is years of dealing with some of the country's biggest oil companies....

Energy

U.S. Wants to Pay Quick-Start Power Plants, Speed Grid Hookups

U.S. energy regulators are seeking to shore up the reliability of the nation's power system by making it easier for new generators to connect to the grid and rewarding those that can respond quickly to disruptions....

Renewable Energy

Brazil Cancels 2016 Wind, Solar Auction on Weak Power Demand

Brazil is pulling the plug on its only auction this year for wind and solar power, a move that took companies by surprise and threatens to leave turbine plants empty and drag down the country's nascent photovoltaic industry....

Renewable Energy

California Approves a Fraction of PG&E's Car-Charging Plan

California cleared PG&E Corp. to invest $130 million in electric-car charging stations, less than a fifth of what the company had proposed to spur use of the emissions-free vehicles and combat climate change....

Renewable Energy

Duties Remain on Solar Panels Made from Taiwanese Cells

It was a bright day for U.S. solar manufacturers Dec. 15, as a Federal Circuit appeals panel reaffirmed antidumping duties on solar panels made from Taiwanese solar cells, but assembled in and exported from Mexico (Kyocera Solar Inc. v. United...

Renewable Energy

Renewables Developers Get IRS Clarifications on Tax Credits

Renewable power facilities can satisfy the IRS's "continuity safe harbor" for claiming the production tax credit by placing a plant in service in 2018 or in a year that is up to four years after the year it started construction,...

Renewable Energy

World Energy Hits a Turning Point: Solar Is Cheaper Than Wind

There's a transformation happening in global energy markets that's worth noting as 2016 comes to an end: Solar power, for the first time, is becoming the cheapest form of new electricity. ...

Asbestos

Canada to Ban Manufacture, Use of Asbestos by 2018

Canada will ban the manufacture, use, import and export of asbestos and asbestos-containing products by 2018, the government said Dec. 15....

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EPA SO2 Science Assessment Weakens Findings On Human Health Harms

EPA's second draft integrated science assessment (ISA) for its review of the sulfur dioxide (SO2) national ambient air quality standards (NAAQS) weakens several findings of adverse health effects contained in an earlier draft in response to criticism from science advisors, further undermining the case for any strengthening of the NAAQS.

EPA Scrambles To Set Deadlines For Dozens Of Overdue State Air Plans

EPA intends to set a series of deadlines by January 19 for the agency to act on dozens of overdue or unapproved Clean Air Act state implementation plans (SIPs) for addressing ozone, as the agency scrambles before the inauguration of President-elect Donald Trump to settle a lawsuit brought by environmentalists over the plans.

House GOP Renews Push For EPA 'Secret Science,' SAB Reform Bills

Rep. Lamar Smith (R-TX), chairman of the House Science, Space, and Technology Committee, is pledging to advance controversial legislative provisions to reform EPA's scientific activities following the agency's release of a long-awaited hydraulic fracturing report, with sources saying the effort could gain traction with the incoming Trump administration.

Research May Hinder Coal Firms' Push For Quick EPA Rules 'Jobs' Review

Major research obstacles on how to review the employment impact of EPA rules could hinder coal firms' push for the agency to quickly issue a court-ordered report on the jobs impacts of its air policies, says an energy sector economist who adds that EPA's two-year plan to seek its advisors' input on the report might be an inevitable step

Judges Back Standing In AFO Air Reporting Suit But Merits Ruling Unclear

Appellate judges at oral argument appeared to back environmentalists' legal standing for their suit challenging EPA's exemptions from hazardous substance emissions reporting requirements for animal feeding operations (AFOs), but it is unclear how the judges will rule on the merits of the case as they asked tough questions of all sides in the suit.

Environmentalists' Bid For Role In EPA 'Jobs' Suit Previews Trump Fights

Environmentalists are making a late bid to intervene in coal firms' successful suit forcing EPA to eventually craft a report on how its air rules have impacted coal sector employment levels, previewing how environmentalists might respond to pending suits over EPA actions in situations where the Trump administration might stop contesting the cases.

GOP, Energy Officials Say EPA Fracking Study Downplays Water Impacts

Republican lawmakers and energy industry officials say that EPA's final study on hydraulic fracturing's potential impacts on drinking water resources clearly demonstrates a lack of major adverse impacts despite criticizing the agency's decision to strip draft language finding "no widespread, systemic impacts" on water resources.

Trump's Nominations Exacerbate Uncertainty About Future Of EPA's RFS

President-elect Donald Trump's list of announced and potential nominations for top administration positions is exacerbating uncertainty over the future of EPA's renewable fuel standard (RFS) once Trump takes office, because the nominees include leading oil industry critics of the program as well as politicians strongly in favor of it.

- Emboldened By Pruitt Pick, Conservatives Renew Calls To Scrap GHG Finding

Emboldened by President-elect Donald Trump's selection of Oklahoma Attorney General Scott Pruitt (R) to head EPA, conservative critics of the Obama EPA are stepping up their calls for the incoming administration to scrap the endangerment finding that underlies the agency's greenhouse gas rules and are suggesting a number of ways Trump could revoke it.

- California Well Positioned To Block Potential Trump Vehicle GHG Rollback

California is in a strong position to thwart potential Trump administration efforts to weaken EPA's greenhouse gas light-duty vehicle standards for model years (MY) 2022-2025, according to a wide variety of sources who cite the state's significant leverage to retain or even strengthen its own GHG program whatever the Trump EPA does on the issue.

Greenwire

EPA

Ethanol industry frets over Pruitt's

record and priorities

Marc Heller, E&E News reporter

Published: Thursday, December 15, 2016

President-elect Donald Trump's choice to head U.S. EPA is beginning to give ethanol advocates the jitters.

The American Coalition for Ethanol yesterday called on its members to write to senators ahead of Scott Pruitt's confirmation hearing for EPA administrator, urging them to grill the nominee on his past opposition to the renewable fuel standard and high-ethanol fuels.

And Sen. Chuck Grassley (R-Iowa), one of the leading allies of ethanol in Congress, said he would press Pruitt and former Texas Gov. Rick Perry (R), selected for Energy secretary, on renewable fuels "since they come from fossil-fuels-producing states."

Nomination hearings haven't been scheduled, but both men are likely to visit with key senators individually in the coming weeks.

The ethanol push comes as advocates consider the record of Pruitt in particular. As attorney general of Oklahoma — a state dominated by oil and gas — Pruitt, a Republican, has sided with oil interests in a lawsuit to overturn EPA's decision to allow the sale of fuel with 15 percent ethanol for vehicles made since 2001, an increase from the 10 percent ethanol blend found at most gas stations.

In November 2013, Pruitt praised EPA for reducing renewable fuel mandates, calling the RFS "unworkable" and citing concerns that ethanol diverts corn from the food supply and raises the cost of food for consumers.

"We urge you to contact your senators and urge them to secure commitments from Mr. Pruitt to remove regulatory restrictions on the use of E-15 and flex fuels and to publicly agree with President-elect Trump's position in support of the U.S. ethanol industry and the renewable fuel standard before agreeing to cast affirmative votes for Pruitt during the confirmation process," the American Coalition for Ethanol told members in a "call to action" on its website.

The coalition is pushing especially hard for EPA to lift seasonal restrictions on the sale of E15, said Brian Jennings, the group's executive vice president. That move, more than any other, would help boost sales of the higher-ethanol fuel, since retailers want to know they can sell it year-round, he said.

Ethanol critics are gearing up, too. The National Wildlife Federation released a report today detailing the conversion of prairies, wetlands and rangeland to corn. A total of 7.3 million acres has been converted, the NWF said, despite regulations intended to prevent that.

"It is time for Congress to take stock of its missed objectives and pass meaningful reform of the Renewable Fuel Standard," the NWF said, urging lawmakers to reduce the mandate and enforce provisions against land clearing.

Ethanol advocates are counting on pro-ethanol statements by Trump to shape the incoming administration's approach. On a recent visit to Des Moines, Iowa, Trump tried to ease concerns about Pruitt's views on ethanol, Iowa Gov. Terry Branstad (R) said at a weekly news conference earlier this week.

"Don't worry about him. He's going to be for ethanol," Branstad recalled Trump saying. "That was reassuring to me."

SENATE

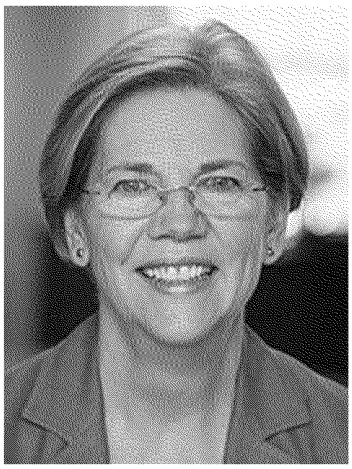
Warren to leave Energy committee

Geof Koss, E&E News reporter

Published: Thursday, December 15, 2016

Sen. Elizabeth Warren (D-Mass.) will step down from the Energy and Natural Resources Committee in the next session of Congress, creating a vacancy on the Democratic side of the dais.

Warren announced yesterday that she will serve on the Armed Services Committee, subject to approval by the Democratic caucus and ratification by the Senate.



Sen. Elizabeth Warren (D-Mass.). Photo courtesy of @SenWarren via Twitter.

"I'm looking forward to serving on the Senate Committee on Armed Services in the next Congress," Warren said in a statement. "All three of my brothers served in the military, and I understand the sacrifices America's service members make to defend our country — and the important work that our Defense Department does to keep Americans safe."

An aide today confirmed that Warren will vacate her seat on the Energy panel next year. Warren has not been particularly active on the committee, although she often shows up to ask questions during hearings.

She supported bipartisan energy reform legislation there last year. Sen. Bernie Sanders (I-Vt.), the other liberal firebrand on the panel, did not.

TOXICS

Canada to ban asbestos by 2018

Published: Thursday, December 15, 2016

The Canadian government announced today that it will ban asbestos use by 2018, in a move that is expected to reduce the incidence of illnesses linked to the substance.

Asbestos is a carcinogenic mineral that was long used in building materials. It is linked to lung cancer and mesothelioma.

"When it comes to asbestos, the scientific evidence is clear," Science Minister Kirsty Duncan said in a statement. "This irrefutable evidence has led us to take concrete action to ban asbestos. ... My colleagues and I will continue to work hard to ensure their families, co-workers and communities will be protected from the harmful impacts of asbestos exposure so they may lead healthy, secure lives."

Canada's ban will apply to the mineral itself, as well as products that contain asbestos.

Over 50 countries have now banned the substance. Asbestos is still permitted in the United States, where it is primarily used in the chloralkali industry (*Greenwire*, Dec. 6).

Public health groups have lobbied the Canadian government for a ban for decades, but until recently officials vigorously defended the country's asbestos mining industry.

The government also said today that it will work to "drastically" limit workplace exposure to asbestos and reform building codes to prohibit its further use.

Asbestos continues to be the leading cause of workplace fatalities in Canada. Over 2,000 Canadians are diagnosed with asbestos-related cancers each year (Tavia Grant, Toronto *Globe*

and Mail, Dec. 15). — **GD**

It's unclear who will take Warren's spot. The seat is often attractive for Western lawmakers, given its jurisdiction over public lands.

The Energy and Natural Resources Committee would allow incoming Nevada Democrat Catherine Cortez Masto to shape policy on the vast tracts of public land in her state and weigh in on nuclear waste policy, which is also in the panel's jurisdiction.

Nevada Republican Sen. Dean Heller formerly served on the panel.

ELECTRIC VEHICLES

Lucid unveils the Air, a challenge to Tesla

Published: Thursday, December 15, 2016

California carmaker Lucid Motors has unveiled a prototype luxury electric sedan aimed at challenging Tesla's Model S.

The 300-person company revealed the Lucid Air yesterday in a ceremony at its Fremont workshop after years of quiet work. Peter Rawlinson, who previously led Model S development for Tesla, is Lucid's chief technology officer.

The sleek, fast car, which Rawlinson said is modeled after an executive jet, will have two powerful electric motors and all the sensors and computing power necessary to drive itself.

It also brings an interior with plenty of legroom and headlights packing thousands of tiny lenses inspired by fly eyes.

"We need to take the very best of the innovation that's coming, this convergence of technologies — the autonomous [driving], the connectedness, the ride sharing — we need to take that and infuse it with all the things we love and are passionate about with the automobile," said Derek Jenkins, a former Mazda executive and Lucid's vice president of design.

The company will start building the cars in 2018 at a factory in Arizona. They are expected to cost more than $100,000.

Lucid executives say the new car represents efforts to rethink the automobile from scratch.

"Companies like Lucid can take a fresh look at the way vehicles are conceived, the way they're laid out and the energy that propels them," said Zak Edson, director of marketing (David Baker, *San Francisco Chronicle*, Dec. 14). — **SM**

AIR POLLUTION

EPA gives states more time to submit haze reduction plans

Sean Reilly, E&E News reporter

Published: Thursday, December 15, 2016

States will get another three years to turn in a new round of plans for curbing haze-related pollution under the final version of regulations signed yesterday by U.S. EPA Administrator Gina McCarthy.

The update to the agency's regional haze program, which appears to largely follow a draft blueprint unveiled earlier this year, pushes back the due date for those plans from July 2018 to July 2021.

The idea is to allow states to also factor in the impact of meeting sulfur dioxide air quality standards and other regulations, the agency said in a fact sheet. The planning period's 2028 end date will remain unchanged.

The update strengthens consultation requirements aimed at bringing National Park Service employees and other federal land managers earlier into the planning process.

It also removes the requirement for regional haze progress reports to take the form of state implementation plan revisions, and it spells out more clearly the requirement that reasonable progress goals be linked to a long-term haze reduction strategy, the fact sheet said. The final rule must still be published in the *Federal Register*.

The regional haze program, dating back to 1999 in its current form, aims to restore visibility in 156 national parks and wilderness areas to natural conditions by 2064.

Much of that haze-forming pollution comes from coal-fired power plants, and states and EPA have repeatedly clashed over the scope of cleanup measures required by the program.

Oklahoma Attorney General Scott Pruitt (R), President-elect Donald Trump's choice to head EPA, spent several years waging an unsuccessful legal fight against a haze plan for his state.

At a May public hearing, environmentalists had opposed the three-year delay for plan submissions. McCarthy signed the rule one day after the Office of Management and Budget finished a standard review.

While the new rule will provide states with more regulatory clarity, the likely result is that "critical air quality requirements will be back-burnered, placing the burden on citizens to hold states accountable for cleaning up pollution harming our parks," Stephanie Kodish, senior director and counsel for the National Parks Conservation Association's clean air program, said in a news release this morning.

Click here to read the rule.

Click here to read the fact sheet

AIR POLLUTION

Settlement would give Trump say-so on ozone region expansion

Sean Reilly, E&E News reporter

Published: Thursday, December 15, 2016

U.S. EPA would punt a final decision on expansion of the Ozone Transport Region until next fall under a tentative lawsuit settlement.

The deal would give the incoming Trump administration the last word on a step that could pressure more states to crack down on smog-forming pollution.

The proposed consent decree, which still requires a judge's signature, would force EPA to propose approval or disapproval by Jan. 18 of the 2013 petition filed by a coalition of Northeastern states to expand the region by nine states. The agency would then have to make a final decision by Oct. 27.

The proposed decree, lodged last week in U.S. District Court for the Southern District of New York, would resolve an October lawsuit brought by New York and five other states that filed the original petition, which alleged that emissions from the nine upwind states are making it more difficult for them to comply with EPA's air quality regulations for ozone.

With a notice set for publication in tomorrow's *Federal Register*, EPA is opening a 30-day public comment period on the tentative agreement.

The proposed timetable for a decision mirrors that of a previous settlement reached last month with North Carolina, one of the states targeted by the petition (*Greenwire*, Nov. 18).

The Ozone Transport Region, created by the 1990 Clean Air Act Amendments, currently encompasses the District of Columbia and all or part of a dozen states, including Maine, New York and Maryland.

As members of the Ozone Transport Commission, based in Washington, they are supposed to strive to reduce the movement of ozone and the chemicals that create it across state lines.

If added to the program, North Carolina, Kentucky, Illinois and the other states named in the petition would have to come up with plans to further cut emissions of nitrogen oxides and volatile organic compounds, the two classes of chemicals that react in sunshine to form ozone, the main ingredient in smog.

The coalition of Northeastern states that brought the 2013 petition argued that those upwind emissions were hurting their ability to meet EPA's 2008 ambient air quality standard for ozone.

RENEWABLE ENERGY

Iceland nears completion of world's hottest borehole

Published: Thursday, December 15, 2016

Icelandic geologists are about to complete the hottest borehole in the world.

They are drilling into a volcano in southwest Iceland seeking superheated steam for geothermal energy.

They are about 3 miles from the heart of the volcano, where temperatures exceed 930 degrees Fahrenheit.

"We hope that this will open new doors for the geothermal industry globally to step into an era of more production," said Ásgeir Margeirsson, CEO of the Iceland Deep Drilling Project, a collaboration among scientists, industry and the national government.

Scientists seek something called "supercritical steam," neither liquid nor gas, found in areas of high heat and pressure. They believe it could produce 10 times as much energy as steam from normal geothermal wells.

"If this works, in the future we would need to drill fewer wells to produce the same amount of energy, meaning we would touch less surface, which means less environmental impact and hopefully lower costs," said Margeirsson.

He and the other geologists are careful in their optimism. It is a volcano, so risk is ever present.

The drilling rig is nearly 15,000 feet below ground.

Iceland's volcanoes are some of the most active in the world, and geothermal heat is a well-established energy source (Rebecca Morelle, BBC News, Dec. 14). — **NB**

CLIMATE

EPA defends new source rule in court

Amanda Reilly, E&E News reporter

Published: Thursday, December 15, 2016

The Obama administration yesterday pushed back against foes' claims that U.S. EPA's carbon rule for new power plants far exceeds the agency's authority.

In a court brief yesterday evening, Justice Department attorneys argued that the agency's reliance on carbon capture and storage was reasonable. EPA took into account the costs of the rule, as well as the feasibility of meeting the standards for different types of coal-burning power plants, the court brief says.

"Fossil-fuel-fired power plants emit vast amounts of CO2 pollution," the 145-page EPA court brief says, "which poses a monumental threat to Americans' health and welfare by driving long-lasting changes in our climate, leading to an array of severe negative effects that will worsen over time."

The U.S. Court of Appeals for the District of Columbia Circuit has scheduled oral arguments in the case in April (*Greenwire*, Dec. 2).

But the fate of the rule and the litigation is up in the air, as the regulation may be among those targeted by the incoming Trump administration. Trump's pick to head EPA, Oklahoma Republican Attorney General Scott Pruitt, is among those challenging the rule in court.

The Trump administration could, for example, ask the court for a delay in the litigation as it reconsiders the standards.

For now, though, EPA is standing by the New Source Performance Standards, which require

both new and modified fossil-fuel-fired power plants to meet carbon dioxide limits. The standards for coal plants can't be met by efficiency improvements alone, meaning operators of new power plants will have to capture carbon and sequester it in deep saline formations.

The standards are separate from but related to the Clean Power Plan. Under the law, EPA can't require existing power plants to meet stricter standards than new power plants, nor can the agency regulate existing sources that aren't covered in new-source rules.

Including Oklahoma, 23 states and dozens of power companies and industry associations have sued over the rule.

Foes of the rule are challenging EPA's so-called best system of emissions reduction, arguing that CCS is costly and hasn't been proved in the real world.

"If EPA can require emission reductions based on a system that does not exist at commercial scale anywhere in the world," challengers said in their opening court brief, "it has the power to deter the construction of new coal-fired power plants in favor of EPA's preferred energy sources" (*Greenwire*, Oct. 14).

EPA yesterday argued that it "reasonably exercised expert judgment" in concluding that partial CCS was the best system of emissions reduction.

The agency said it found that most coal-fired power plants have access to CO2 storage in deep saline formations and that 29 states have oil recovery operations or geology that's amenable to CCS.

EPA also said that its conclusion was supported by the Boundary Dam plant in Canada, the world's first carbon capture project on a large coal plant. The project's operator, SaskPower, in November announced the Boundary Dam had injected 800,000 metric tons of carbon dioxide underground in a year, reaching its target for the time period (*E&E News PM*, Nov. 1).

"Post-combustion CCS is already in successful, full-scale commercial operation at the Boundary Dam Plant," EPA said.

Foes argue that the plant receives substantial government funding from Canada, is smaller than a typical plant, has suffered massive cost overruns and doesn't sequester in deep saline formations.

Just because the plant was partially subsidized by the Canadian government, EPA argued, "does not render it inappropriate" to use as a basis for the new source rule.

EPA also yesterday said that the rule only anticipates that new power plants will capture and store between 16 and 23 percent of carbon dioxide emissions. Boundary Dam, while smaller than other coal-fired power plants, fully captures carbon dioxide, EPA said, meaning larger plants would be able to use similar equipment to meet the rule's requirements.

The agency also pushed back against North Dakota's claims that the rule creates a "de facto ban"

on lignite-coal-fueled power plants, which release high carbon dioxide emissions and normally require more energy-intensive control technologies than other coal-fired plants.

EPA said that lignite-fired power plants can meet its standards and that it properly decided not to set separate standards for the facilities.

Environmentalists have vowed to continue defending the standards in court.

"EPA's brief underscores that these standards have a firm basis in the law. These protections are vital, common-sense measures that will help safeguard the public from the worst dangers of climate change," said Martha Roberts, attorney for the Environmental Defense Fund, which is a party to the case. "We look forward to helping defend them in court."

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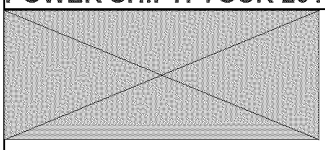
POWER SHIFT: YOUR 2017 TRANSITION GUIDE



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Pruitt dismantled environmental unit in Okla.

President-elect Donald Trump's pick to run U.S. EPA has already eliminated one environmental protection entity during his time in government.

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Trump team looks for bias in DOE's outlook

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Legislature finishes energy overhaul in lame duck's final hours

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Tillerson's Exxon showed appetite for risk, with mixed results

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Soaring storage in Okla. town threatens OPEC deal

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Physicians group doubles down in refinery fight

13.PIPELINES:

Swedish island rejects Russia's storage deal

E&ETV'S THE CUTTING EDGE

14.TRANSITION:

E&E News' Hulac discusses impact of Tillerson's climate views on confirmation

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CLIMATEWIRE — Fri., December 16, 2016

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How America lost its 'commanding lead' on solar as demand boomed

For almost a half-century, the lack of commercial uses for solar energy gave it a peculiar character. It was well-suited for a number of niche applications, such as space satellites and the need for remote power in places far away from an electric grid. Its costs remained too high for solar to become a mainstream energy source. But the last decade has been one of phenomenal change.

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Exxon's complicated relationship with carbon pricing

3.AUTOS:

'We need more customers!' Calif. revisits clean car rule

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Dems urge Kerry to protect employees from Trump

5.STATE DEPARTMENT:
Pershing: Tillerson might be 'best bet' for climate

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Start planning for sea-level rise now, scientists warn

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Researchers identify 24 weather events worsened by people

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El Niño raised tides, like future warming

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Disasters cost $158B, 10K deaths in 2016

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New-generation vehicles get into gear

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INTERNATIONAL

13.MARSHALL ISLANDS:
Pacific leader invites Tillerson to disappearing nation

E&ETV'S THE CUTTING EDGE

14.TRANSITION:
E&E News' Hulac discusses impact of Tillerson's climate views on confirmation

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To: Anderson, Lea[anderson.lea@epa.gov]; Marks, Matthew[Marks.Matthew@epa.gov]; Smith, Kristi[Smith.Kristi@epa.gov]; Srinivasan, Gautam[Srinivasan.Gautam@epa.gov]
From: Greenglass, Nora
Sent: Fri 12/9/2016 6:19:35 PM
Subject: RE: list of haze actions

Ex. 5 - Deliberative Process

From: Anderson, Lea
Sent: Friday, December 09, 2016 10:38 AM
To: Marks, Matthew <Marks.Matthew@epa.gov>; Smith, Kristi <Smith.Kristi@epa.gov>; Srinivasan, Gautam <Srinivasan.Gautam@epa.gov>; Greenglass, Nora <Greenglass.Nora@epa.gov>
Subject: RE: list of haze actions

Ex. 5 - Deliberative Process

From: Marks, Matthew
Sent: Friday, December 09, 2016 7:53 AM
To: Smith, Kristi <Smith.Kristi@epa.gov>; Srinivasan, Gautam <Srinivasan.Gautam@epa.gov>; Anderson, Lea <anderson.lea@epa.gov>; Greenglass, Nora <Greenglass.Nora@epa.gov>
Subject: Re: list of haze actions

Kristi, you are correct. For some reason, I had thought our Louisiana dates were further out, but I checked and they are March 31, 2017 for proposal and December 15, 2017 for

final. These are CD deadlines and they involve EGUs.

From: Smith, Kristi
Sent: Thursday, December 8, 2016 6:16:12 PM
To: Marks, Matthew; Srinivasan, Gautam; Anderson, Lea; Greenglass, Nora
Subject: RE: list of haze actions

Rhea just told me that we have a March 31,2017 deadline for Proposed action on the Louisiana haze SIP/FIP

Kristi M. Smith * Assistant General Counsel for the NAAQS Implementation Group * Air & Radiation Law Office * US EPA, Office of General Counsel * smith.kristi@epa.gov * (202) 564-3068 *

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From: Marks, Matthew
Sent: Thursday, December 08, 2016 5:24 PM
To: Srinivasan, Gautam <Srinivasan.Gautam@epa.gov>; Anderson, Lea <anderson.lea@epa.gov>; Greenglass, Nora <Greenglass.Nora@epa.gov>
Cc: Smith, Kristi <Smith.Kristi@epa.gov>
Subject: RE: list of haze actions

For the next 6 months, I don't think there are that many, but two that come to mind are:

- Texas regional haze BART proposal (multiple EGUs) – CD deadline of December 9

- Nebraska regional haze remand action for Gerald Gentleman proposal (EGU) – No deadline, **Ex. 5 - Deliberative Process**

There are also deadlines to finalize action on Texas regional haze BART and propose and finalize action on Louisiana BART, but they are more than 6 months out. There are also remand

actions in North Dakota, Montana, and Pennsylvania without deadlines, the Texas reasonable progress FIP remand if the court grants our motion, and likely settlement agreement deadlines to propose and finalize action on Colorado and taconite coming down the pike. Sorry for not being able to provide something more concrete, but I am sure Lea can fill in any gaps tomorrow.

From: Srinivasan, Gautam
Sent: Thursday, December 08, 2016 12:57 PM
To: Anderson, Lea <anderson.lea@epa.gov>; Marks, Matthew <Marks.Matthew@epa.gov>; Greenglass, Nora <Greenglass.Nora@epa.gov>
Cc: Smith, Kristi <Smith.Kristi@epa.gov>
Subject: list of haze actions

Attorney Work Product

Privileged and confidential

Hi all. Is there a list of all upcoming haze actions? Not just the rule and guidance but also all the state-specific actions we will be proposing and finalizing over the next 6 months. If there is no existing list, can you all please work together to compile such a list? It would also be good to know whether EGUs are involved (if it's easier to indicate where EGUs are NOT involved, that's fine). Ex. 5 - Attorney Client

Ex. 5 - Attorney Client

Can this be done by COB tomorrow? Please let me know, and thanks for your help.

++++++++++++

202-564-5647 (o)

Ex. 6 - Personal Privacy (c)

To: Marks, Matthew[Marks.Matthew@epa.gov]
From: Greenglass, Nora
Sent: Mon 12/5/2016 2:55:24 PM
Subject: 321 argument from UT RH motion to stay
Counties Motion in Support of Stay.pdf

Here's the relevant paragraph—it shows up on page 11 of the attached document. We respond to their BART Guidelines argument elsewhere.

As noted above, the CAA requires the consideration of "energy … impacts,"

42 U.S.C. § 7491(g)(2), and the BART Guidelines contemplate consideration of

"economic disruption or unemployment." 40 C.F.R. pt. 51, app. Y, § IV.D.4.h.5.

The CAA also requires EPA, under a separate and independent provision, to

evaluate potential loss or shifts of employment related to implementation plans on

an ongoing basis. Section 7621 of the CAA requires EPA to "conduct continuing

evaluations of potential loss or shifts of employment which may result from the

administration or enforcement of . . . implementation plans, including where

appropriate, investigating threatened plant closures or reductions in employment

allegedly resulting from such . . . enforcement." 42 U.S.C. § 7621(a) (emphasis

added); *Murray Energy Corp. v. McCarthy*, No. 5:14-CV-39, 2016 WL 6083946,

at *9 (N.D.W.Va. Oct. 17, 2016) (interpreting Section 7621 to "impose a mandatory duty upon the EPA"). EPA is acutely aware that its BART FIPs have

resulted in the shutting down of coal-fired units.

Deliberative process, Attorney Work Product

Office of General Counsel

U.S. Environmental Protection Agency

greenglass.nora@epa.gov

202-564-3095 (office)

Ex. 6 - Personal Privacy (cell)

To: Vaden, Christopher (ENRD)[Christopher.Vaden@usdoj.gov]; Marks, Matthew[Marks.Matthew@epa.gov]; Pinkston, Daniel (ENRD)[Daniel.Pinkston@usdoj.gov]; Smith, Kristi[Smith.Kristi@epa.gov]; Tomasovic, Brian[Tomasovic.Brian@epa.gov]; Lipshultz, Jon (ENRD)[Jon.Lipshultz@usdoj.gov]; Carson, Davida[David.a.Carson@usdoj.gov]
From: O'Donnell, Jessica (ENRD)
Sent: Fri 12/2/2016 8:55:03 PM
Subject: RE: Please use this version.
ENV_DEFENSE-#789386-v1-jod_comments_Tex_v__EPA_remand_mot_with_Vaden_edits_.DOCX

Dan – I did not have any substantive comments; thanks for turning this around so quickly!

I did catch a couple of typos, which I noted in the attached, in case that's helpful.

Thanks,

Jessica

From: Vaden, Christopher (ENRD)
Sent: Friday, December 2, 2016 3:38 PM
To: Marks, Matthew <Marks.Matthew@epa.gov>; Pinkston, Daniel (ENRD) <DPinkston@ENRD.USDOJ.GOV>; Smith, Kristi <Smith.Kristi@epa.gov>; Tomasovic, Brian <Tomasovic.Brian@epa.gov>; Lipshultz, Jon (ENRD) <JLipshultz@ENRD.USDOJ.GOV>; O'Donnell, Jessica (ENRD) <JO'Donnell@ENRD.USDOJ.GOV>; Carson, David A (ENRD) <DCarson@ENRD.USDOJ.GOV>
Subject: RE: Please use this version.

The attached version shows my handful of edits and comments. Ex. 5 - Attorney Client

Ex. 5 - Attorney Client

Chris

From: Marks, Matthew [mailto:Marks.Matthew@epa.gov]
Sent: Friday, December 02, 2016 3:13 PM
To: Pinkston, Daniel (ENRD) <DPinkston@ENRD.USDOJ.GOV>; Smith, Kristi <Smith.Kristi@epa.gov>; Tomasovic, Brian <Tomasovic.Brian@epa.gov>; Vaden, Christopher (ENRD) <CVaden@ENRD.USDOJ.GOV>; Lipshultz, Jon (ENRD) <JLipshultz@ENRD.USDOJ.GOV>; O'Donnell, Jessica (ENRD) <JO'Donnell@ENRD.USDOJ.GOV>; Carson, David A (ENRD) <DCarson@ENRD.USDOJ.GOV>
Subject: RE: Please use this version.

Hi Dan,

Given the quick turnaround time, Kristi and I made our edits in separate documents. Apologies for that, but we both started working immediately. I made some cuts to get us down to length, although I am not sure if I made enough. I also added some stuff on BART in places to help improve that narrative.

Matt

From: Pinkston, Daniel (ENRD) [mailto:Daniel.Pinkston@usdoj.gov]
Sent: Friday, December 02, 2016 2:11 PM
To: Smith, Kristi <Smith.Kristi@epa.gov>; Marks, Matthew <Marks.Matthew@epa.gov>; Tomasovic, Brian <Tomasovic.Brian@epa.gov>; Vaden, Christopher (ENRD) <Christopher.Vaden@usdoj.gov>; Lipshultz, Jon (ENRD) <Jon.Lipshultz@usdoj.gov>; O'Donnell, Jessica (ENRD) <Jessica.O'Donnell@usdoj.gov>; Carson, Davida <David.a.Carson@usdoj.gov>
Subject: Please use this version.

To: Marks, Matthew[Marks.Matthew@epa.gov]; Pinkston, Daniel (ENRD)[Daniel.Pinkston@usdoj.gov]; Smith, Kristi[Smith.Kristi@epa.gov]; Tomasovic, Brian[Tomasovic.Brian@epa.gov]; Lipshultz, Jon (ENRD)[Jon.Lipshultz@usdoj.gov]; O'Donnell, Jessica (ENRD)[Jessica.O'Donnell@usdoj.gov]; Carson, Davida[David.a.Carson@usdoj.gov]
From: Vaden, Christopher (ENRD)
Sent: Fri 12/2/2016 8:38:17 PM
Subject: RE: Please use this version.
ENV_DEFENSE-#789380-v1-Further_Vaden_edits_to_Texas_v__EPA_remand_motion.DOCX

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Ex. 5 - Attorney Client

Chris

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Subject: Please use this version.

To: Smith, Kristi[Smith.Kristi@epa.gov]; Marks, Matthew[Marks.Matthew@epa.gov]; Tomasovic, Brian[Tomasovic.Brian@epa.gov]; Carson, Davida[David.a.Carson@usdoj.gov]; O'Donnell, Jessica (ENRD)[Jessica.O'Donnell@usdoj.gov]; Lipshultz, Jon (ENRD)[Jon.Lipshultz@usdoj.gov]; Vaden, Christopher (ENRD)[Christopher.Vaden@usdoj.gov]
From: Pinkston, Daniel (ENRD)
Sent: Fri 12/2/2016 7:04:49 PM
Subject: Attached is a draft of the remand motion with material added regarding the CSAPR issues....
DENVER-#558758-v4-Tex_v__EPA_remand_mot_with_Vaden_edits.docx

I have not edited this and I'm sending it out so people can take a look early. We would need to trim about 350 words or so from the motion to meet the word count.

Dan

UNITED STATES COURT OF APPEALS
FOR THE TENTH CIRCUIT

STATE OF UTAH, on behalf of the Utah Department of Environmental Quality, Division of Air Quality, Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, and GINA MCCARTHY, Administrator of the United States Environmental Protection Agency, Respondents.	***Case No. 16-9541***
PACIFICORP, Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, and GINA MCCARTHY, Administrator of the United States Environmental Protection Agency, Respondents.	***Case No. 16-9542***
UTAH ASSOCIATED MUNICIPAL POWER SYSTEM, Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, and GINA MCCARTHY, Administrator of the United States Environmental Protection Agency, Respondents.	***Case No. 16-9543***

88941792.4 0059408-00001

DESERET GENERATION & TRANSMISSION CO-OPERATIVE, Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, and GINA MCCARTHY, Administrator of the United States Environmental Protection Agency, Respondents. HEAL UTAH, NATIONAL PARKS CONSERVATION ASSOCIATION, SIERRA CLUB, and UTAH PHYSICIANS FOR A HEALTHY ENVIRONMENT Respondent-Intervenors. CARBON COUNTY, UTAH, and EMERY COUNTY, UTAH Petitioner-Intervenors.	***Case No. 16-9545***

EMERY COUNTY AND CARBON COUNTY'S MOTION FOR STAY

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Utah Department of Workforce Services, Employment and Unemployment Labor Force Data, http://jobs.utah.gov/jsp/wi/utalmis/countyareas.do?seasadj=0&d-2384982-o=2&item=lf&d-2384982-s=0&d-2384982-p=1&periodyear=2016 (last visited Oct. 31, 2016) 5

GLOSSARY OF ACRONYMS

BART ..... Best Available Retrofit Technology

CAA ..... Clean Air Act

EPA ..... Environmental Protection Agency

FIP ..... Federal Implementation Plan

RHR ..... Regional Haze Rule

SCR ..... Selective Catalytic Reduction

SIP ..... State Implementation Plan

Pursuant to Rule 18 of the Federal Rules of Appellate Procedure, Emery County and Carbon County (collectively, the "Counties") respectfully submit this Motion for Stay of EPA's July 5, 2016 Final Rule ("Final Rule") while the Rule is under review, or in the alternative, Brief in Support of the Motions for Stay filed by the State of Utah and PacifiCorp.

INTRODUCTION

The Hunter and Huntington power plants (the "Plants") are located in Emery County, and the Skyline and Dugout coal mines which provide coal to the Plants are located in Carbon County. The costly selective catalytic reduction ("SCR") requirements of EPA's Final Rule threaten to fracture the Counties' economic backbone—the coal-mining and utility industries. These industries provide hundreds of jobs, support dozens of businesses, and provide a significant portion of the otherwise limited tax base for these Counties. Compliance costs associated with the federal implementation plan ("FIP") are astronomical—$700 million for an improvement in visibility that would be imperceptible to the human eye. For the Counties, the price tag is even higher and threatens their economic stability. If a stay is not granted and this Court eventually vacates the challenged provisions of the Final Rule, the Counties will not be able to recover their economic damages resulting during the appeal. As a result, the Counties seek a stay to avoid unnecessary economic disruption that will necessarily result if the owners of the

Plants (the "Owners") are required to move forward with the FIP during the appeal.

STATEMENT OF JURISDICTION

This Court has jurisdiction to review EPA's decision on the Final Rule under 42 U.S.C. § 7607(b)(1), and authority to grant a stay under 5 U.S.C. § 705.

BACKGROUND

The Counties adopt the background presented by PacifiCorp and the State of Utah.

STANDARD OF REVIEW

The Tenth Circuit uses the same standard for deciding motions to stay agency actions as deciding preliminary injunctions. 10th Cir. R. 8.1, 18.1; *see Associated Sec. Corp. v. SEC*, 283 F.2d 773, 774-75 (10th Cir. 1960). A party seeking to stay agency actions must establish (1) the likelihood of success on the merits; (2) the threat of irreparable harm if the stay is not granted; (3) the absence of harm to opposing parties if the stay is granted; and (4) that a stay is in the public interest. 10th Cir. R. 8.1. The Counties will address their unique irreparable harm, merits, absence of harm to others, and public interest arguments, and also adopt the arguments made by the other movants.

ARGUMENT

I. There Is a Threat of Irreparable Harm if a Stay Is Not Granted.

The irreparable harm requirement is met if the movant can demonstrate "'a significant risk that he or she will experience harm that cannot be compensated after the fact by monetary damages.'" *RoDa Drilling Co. v. Siegal*, 552 F.3d 1203, 1210 (10th Cir. 2009) (citation omitted). Although financial harm alone may be insufficient in some circumstances, it does constitute irreparable harm "where no 'adequate compensatory or other corrective relief will be available at a later date, in the ordinary course of litigation.'" *Mexichem Specialty Resins, Inc. v. EPA*, 787 F.3d 544, 555 (D.C. Cir. 2015) (citation omitted); *Crowe & Dunlevy, P.C. v. Stidham*, 640 F.3d 1140, 1157 (10th Cir. 2011) ("'imposition of money damages that cannot later be recovered for reasons such as sovereign immunity constitutes irreparable injury'" (brackets and citation omitted)). Particularly applicable here, "unemployment and the permanent closure of [power] plants" have also been deemed to constitute irreparable harms, as recently held by the Fifth Circuit in staying the implementation of a FIP in Texas. *Texas v. EPA*, 829 F.3d 405, 434–35 (5th Cir. 2016).

As explained by the State of Utah and PacifiCorp, the Final Rule's compliance deadlines do not allow the Owners to delay implementation pending a final decision from this Court. Utah brief at 9-10; PacifiCorp brief at 20-21. As a

result, if the Final Rule is not stayed, the Owners will be required to move forward with the costly FIP, including $2,200,000 in costs by the end of 2017, and a "significant ramp up in costs" after 2017. PacifiCorp brief at 20. Alternatively, and more likely, the cost-prohibitive FIP will force the Owners to begin to consider the shutdown of the Plants, as EPA has seen on several occasions,[1] or possibly convert them to natural gas plants. Under either scenario, the Counties would be irreparably harmed as unemployment and other economic disruption would ensue, and money damages would be barred by sovereign immunity.

The Counties have both been designated as "Mining Dependent" by the U.S. Department of Agriculture.[2] The Counties are home to six of the State's seven coal mines.[3] Not surprisingly, coal mining and related coal-fired utility jobs represent a significant percentage of the jobs in the Counties, approximately 30%

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[1] For example, units at the Apache and Cholla plants in Arizona, San Juan plant in New Mexico, Boardman plant in Oregon, and Craig plant in Colorado, have been shut down or converted rather than retrofitted with prohibitively expensive SCR. *See*, Apache Plant, 80 Fed. Reg. 19220 (Feb. 27, 2015); Cholla Plant, 81 Fed. Reg. 46852 (July 19, 2016); Boardman Plant, 76 Fed. Reg. 38997 (July 5, 2011). In addition, PacifiCorp's Carbon plant was shut down due to the mercury rule and as part of the BAR Alternative.

[2] USDA, Economic Research Service, County Typology Codes (2015), http://www.ers.usda.gov/data-products/county-typology-codes.aspx.

[3] South Eastern Utah Economic Development District, Workforce Study ("SEUEDD Workforce Study") at 6 (Mar. 2016) (Exhibit A).

in Emery County.[4] As a result, the Counties have already been impacted by the recent decline in the coal industry, including the recent closure of the Deer Creek mine in Emery County and the Horizon mine in Carbon County. Over the past three years, employment in coal mining in Carbon County has decreased by 21%, and in Emery County by a staggering 36%.[5] In addition, the closure of the Carbon power plant (in Carbon County) in 2015 resulted in a direct loss of 70 jobs and indirect loss of up to 300 jobs.[6] Unemployment rates in the Counties for 2016 are already almost double the statewide average.[7]

In the likely event that the Plants will be pushed into early closure as a result of the costly FIP requirements, the Counties would be severely harmed. Job losses at the two Plants alone would exceed 370 employees or approximately $35 million

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[4] *Id.* at 17.

[5] *Id.* at 4.

[6] Amy Joi O'Donoghue, *End of an era: Mercury rule shutters Utah's oldest power plant*, Deseret News (Apr. 14, 2015), http://www.deseretnews.com/article/865626442/End-of-an-era-Mercury-rule-shutters-Utahs-oldest-power-plant.html?pg=all; EPA Response to Comments ("RTC") at 377 (Exhibit B).

[7] Average unemployment rate for all of Utah for 2016 through September was 3.3%. For Carbon and Emery Counties, it was 6.4% and 6.8% respectively. Utah Department of Workforce Services, Employment and Unemployment Labor Force Data, http://jobs.utah.gov/jsp/wi/utalmis/countyareas.do?seasadj=0&d-2384982-o=2&item=lf&d-2384982-s=0&d-2384982-p=1&periodyear=2016 (last visited Oct. 31, 2016).

in wages.[8] Additional indirect job losses would also be expected in the many sub-industries that supply, service, and support the plants, including local equipment vendors, transportation providers, engineers, contractors, consultants, etc., estimated at another 300+ jobs or another $25 million in wages.[9] One Emery County commissioner estimates the economic impact could be double this—800+ jobs in Emery County alone.[10] Additional job losses would also be likely in the local coal mining industry as the coal for the closed or converted plants would no longer be needed.[11] When Congress designed the CAA, it was particularly concerned about such irreparable employment harm, and emphasized that the impact of such implementation plans on the "potential loss or shifts of employment" matter. 42 U.S.C. § 7621(a).

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[8] Estimate based on PacifiCorp projections and average monthly wage in utilities sector for Emery County for third quarter 2015. SEUEDD Workforce Study at 24-25.

[9] Estimate based on PacifiCorp projections and the mean of the average monthly wage for mining and utilities jobs for the Counties for third quarter 2015. *Id.*

[10] Patsy Stoddard, *Part I: Commissioner Brady speaks at EPA hearing on regional haze*, Emery County Progress (Feb. 2, 2016), http://ecprogress.com/index.php?tier=1&article_id=18488("The economic impact of the Hunter and Huntington Power Plants is a large portion of our economy in Emery County. The economic impact Rocky Mountain Power has had to Emery County in direct and indirect is 800+ jobs.").

[11] The Dugout and Skyline mines provide approximately 2,000 direct and indirect jobs, which jobs provide average annual pay and benefits of approximately $110,000.

The loss of more than $60 million of employment income for the Counties' residents would undoubtedly also have a significant and incremental trickle-down impact on all sectors of the Counties' economies, and notably a significant impact on the Counties' own property, sales, and other tax, fee, and license revenues.[12] In addition, the continued job losses and the uncertainty created by the FIP are detrimentally impacting the Counties by making it difficult to expand or attract businesses, in particular businesses in the mining or utility industries.[13]

Even if the plants were able to avoid early closure, the estimated $700 million to implement the FIP would likely be passed along to ratepayers, including the Counties' residents. By EPA's own estimates, implementation of the FIP will result in 5-10% rate increases.[14] While mining and utility jobs pay higher than average wages, the remaining residents of the Counties are not so fortunate. Excluding mining and utility jobs, the remaining 70% of Emery County residents' average monthly wage is $2,413, and the remaining 86% of Carbon County

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[12] The plants provide a significant portion of the tax base for Emery County, contributing approximately $7.9 million annually in property taxes. *See* Chad Teply Decl. at 4.

[13] SEUEDD Workforce Study at 31-35 ("mines have closed and a moratorium has been placed on renewing coal leases, resulting in significant decreases in employment… companies wishing to expand are presently required to postpone any plans of growth….").

[14] *See* EPA RTC at 370.

residents' average monthly wage is $2,374[15]—both more than $1,000 less than the statewide average of $3,539.[16] Of these non-mining and non-utility workers, many earn less than minimum wage ($1,256 per month).[17] These wage statistics show that the anticipated rate increases will cause significant harm to the already burdened residents. Business ratepayers will be similarly harmed, unless they can pass those increases along to consumers—many of whom are residents of the Counties, creating even further harm. Such rate increase caused by EPA-mandated controls was one of several factors justifying the recent stay of a Regional Haze FIP in Texas. *Texas v. EPA*, 829 F.3d at 433.

In short, irrespective of the course of action the Owners follow if a stay is not granted, the Counties' residents and businesses, and its own tax revenues, will suffer irreparable harm.

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[15] SEUEDD Workforce Study at 17-18, 24-25.

[16] Department of Workforce Services, Employment and Wage Statistics, Utah Statewide, 3rd Quarter 2015, https://jobs.utah.gov/jsp/wi/utalmis/industrydetail.do (last visited Nov. 1, 2016).

[17] In Emery County 19% of the non-mining and non-utility industry wage earners earn less than minimum wage, and in Carbon County, it is 15.5%. SEUEDD Workforce Study at 17-18, 24-25.

II. Petitioners Are Likely to Succeed on the Merits Because EPA Failed to Properly Consider Economic and Employment Impacts as Required by the Statutory BART Factors.

To demonstrate likelihood of success on the merits, a movant need only present a "'prima facie case,'" not a "'certainty of winning.'" *Planned Parenthood Ass'n of Utah v. Herbert*, 828 F.3d 1245, 1252 (10th Cir. 2016) (citation omitted). The Counties satisfy this standard because EPA failed to consider economic disruption and unemployment in its Final Rule, including the EPA's BART determinations. EPA's failure was arbitrary and capricious, an abuse of discretion, and not in accordance with the law.

In making a BART determination, the CAA requires the consideration of various specified factors, including the "energy and the nonair quality environmental impacts of compliance …." 42 U.S.C. § 7491(g)(2). In considering energy impacts, the EPA's own BART Guidelines provide for the consideration of any "economic disruption or unemployment." 40 C.F.R. pt. 51, app. Y, § IV.D.4.h.5.[18]

When promulgating a FIP, EPA stands in the shoes of the State, and must meet the same requirements. *See* 77 Fed. Reg. 40,150, 40,164 (July 6, 2012). EPA

[18] The Guidelines also contemplate in these circumstances the conduct of "an economic analysis that demonstrates, in sufficient detail for public review, the specific economic effects, parameters, and reasoning" for a BART selection. 40 C.F.R. pt. 51, app. Y, § IV.E.3.2.

was required to conduct the necessary analyses and consider the relevant information set forth in the CAA and the BART Guidelines. "Just as the State was required to properly consider each statutory factor in the BART analysis in the implementation of its SIP, so too was EPA in the promulgation of its FIP." *North Dakota v. EPA*, 730 F.3d 750, 764 (8th Cir. 2013).

Despite the requirements calling for the consideration of economic disruption and unemployment, EPA failed to do so. EPA was repeatedly made aware of these deficiencies during the comment period.[19]

[19] *See, e.g.*, PacifiCorp Comments, EPA-R08-OAR-2015-0463-0169, at 41, Mar. 3, 2016 ("When considering the FIP Proposal, EPA must include in its evaluation of energy impacts and their associated costs the impacts to local jobs and state and local economies surrounding the affected facilities. With retirement, replacement, or natural gas conversion of individual units a potential outcome due to EPA's FIP Proposal, EPA's assessment must include coordination with state regulators, environmental agencies and elected officials."); County Commissioner Comments, EPA-R08-OAR-2015-0463-0063 ("The economic impact of the Hunter and Huntington Power Plants is a large portion of our economy in Emery County. The economic impact Rocky Mountain Power has had to Emery County in direct and indirect is 800+ jobs."); Carbon County Board of Commissioners Comment, Mar. 10, 2016 ("Carbon County is most concerned that, based on testimony from the Navajo tribe with a population of 166,826 how the loss of nearly 1,000 jobs between the plant and the mine would be too great of an impact to the tribe. Yet the loss of 1,260 direct and 1,850 indirect jobs between the mines and power plants and our supporting businesses in the Carbon/Emery County area with a combined population of 31,737 somehow does not measure up to the a major economic impact to the area and our citizens? Why has no testimony been taken on the impacts to our area?"); Public Lands Administrator Comment, Jan. 26, 2016 ("PacifiCorp and its predecessors have been good neighbors and is an extremely important economic asset to Emery County.").

In response to comments requesting that EPA consider all the required factors and conduct all contemplated analyses, EPA attempted to excuse its failure by erroneously stating that "[n]either the CAA nor the RHR provide for consideration of the affordability of controls, ratepayer impacts or potential job losses as part of a BART determination analysis."[20] EPA's position is inconsistent with the CAA and the BART Guidelines.

As noted above, the CAA requires the consideration of "energy … impacts," 42 U.S.C. § 7491(g)(2), and the BART Guidelines contemplate consideration of "economic disruption or unemployment." 40 C.F.R. pt. 51, app. Y, § IV.D.4.h.5. The CAA also requires EPA, under a separate and independent provision, to evaluate potential loss or shifts of employment related to implementation plans on an ongoing basis. Section 7621 of the CAA requires EPA to "conduct continuing evaluations of potential loss or shifts of employment which may result from the administration or enforcement of . . . implementation plans, including where appropriate, investigating threatened plant closures or reductions in employment allegedly resulting from such . . . enforcement." 42 U.S.C. § 7621(a) (emphasis added); *Murray Energy Corp. v. McCarthy*, No. 5:14-CV-39, 2016 WL 6083946, at *9 (N.D.W.Va. Oct. 17, 2016) (interpreting Section 7621 to "impose a

[20] EPA RTC at 364–65.

mandatory duty upon the EPA"). EPA is acutely aware that its BART FIPs have resulted in the shutting down of coal-fired units.

EPA attempts to excuse its failure to consider economic disruption and unemployment by suggesting that such impacts should be considered "only in 'unusual circumstances.'"[21] This attempted "unusual circumstances" excuse derives from a different section of the BART Guidelines and is irrelevant here. *Compare* 40 C.F.R. pt. 51, app. Y, § IV.D.4.h.5 (consideration of economic and employment impacts as part of the *energy impacts analysis* for two similar alternatives) *with* 40 C.F.R. pt. 51, app. Y, § IV.E.3.2 (identifying the "unusual circumstances" when the *affordability of the controls* should be considered in *selecting a best alternative*). But in any event, this case does present "unusual circumstances" warranting consideration of economic effects. All of the BART units are located in close proximity to several small communities that are highly dependent on the mining and utility industries, and the employment impacts from closure of even one unit would be significant for these Counties. In addition to the numerous comments that address these unusual circumstances in the Counties, EPA itself cites data that qualify as the "unusual circumstances" when the

[21] EPA RTC at 364–65.

affordability of controls should be considered, *i.e.*, when such costs impact "product prices, the market share, and profitability of the source."[22]

EPA further attempts to excuse its failure to consider economic and unemployment impacts by shifting the responsibility for performing such analysis away from itself. EPA stated, "[W]e lack evidence to support the assertions that our proposed FIP would result in significant rate increases, jeopardize the plant's operations, or result in any other economic effects. In the absence of such evidence, commenter's assertions regarding job losses are speculative, and we cannot consider them as part of our BART determination."[23] But EPA had a statutory duty (under Section 7621 as addressed above) to conduct the very employment analysis that would have confirmed the job loss information EPA claims it lacked. *Murray Energy Corp.*, No. 5:14-CV-39, 2016 WL 6083946, at *25. EPA cannot claim it "lacked evidence" when it had the statutory duty to collect the evidence in the first instance and yet failed to do so. Further, because EPA has seized the prerogative to propose the FIP, it has the duty to conduct the economic analysis—not the State or the petitioners. *See* *North Dakota v. EPA*, 730 F.3d at 764; 77 Fed. Reg. at 40,164.

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[22] *See* EPA RTC at 370 (estimating, based on EPA's own cost estimates, that installation of SCR will result in 5-10% higher rates).

[23] EPA RTC at 365.

III. The Public Interest Favors a Stay, and There Will Be No Harm to the Other Parties.

In addition to the arguments made by the other movants (which the Counties adopt), the Counties note the public has an interest in avoiding economic disruption, unemployment, and rate increases. In addition, and as further explained by the other movants, there would be no harm to the opposing parties if the Final Rule were delayed for the short review period because visibility is not a public health concern, any potential improvement in visibility from the SCR would be imperceptible to the human eye, and the Final Rule does not even require any further emission reductions until 2021.

CONCLUSION

Based on the foregoing, and on the reasons set forth by the State of Utah and PacifiCorp, the Counties respectfully request that the Court grant the moving parties' motions to stay.

/s/Martin K. Banks
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/s/Lauren E. Hosler
Lauren E. Hosler (USB No. 14205)

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CERTIFICATE OF DIGITAL SUBMISSION

I hereby certify with respect to the foregoing:

1) all required privacy redactions have been made pursuant to Rule 25.5 of the Tenth Circuit Local Rules;

2) if required to file additional hard copies, that the ECF submission is an exact copy of those documents; and,

3) the digital submission has been scanned for viruses with the most recent version of a commercial virus scanning program, Endpoint Protection (Product version 4.7.214.0) most recently updated on November 2, 2016, and according to the program, the submission is free of viruses.

Respectfully submitted this 2nd day of November, 2016.

STOEL RIVES LLP

/s/Lauren E. Hosler
Lauren E. Hosler

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION AND TYPE-FACE REQUIREMENTS

In accordance with this Court's Order of October 6, 2016, which allows the Counties to share in the petitioners' combined limitation of 20,800, this motion contains 3,184 words, exclusive of the items listed in Fed. R. App. P. 32(a)(7)(B)(iii).

This motion complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because this motion has been prepared in a proportionally spaced typeface using MS Word 2010 in 14 point Times New Roman.

Respectfully submitted this 2nd day of November, 2016.

STOEL RIVES LLP

/s/Lauren E. Hosler
Lauren E. Hosler

CERTIFICATE OF SERVICE

I hereby certify that on this 2nd day of November, 2016, the foregoing **EMERY COUNTY AND CARBON COUNTY'S MOTION TO STAY** was filed electronically with the Clerk of the Court for the United States Court of Appeals for the Tenth Circuit by using the appellate CM/ECF system, which will send notification of this filing to all counsel of record:

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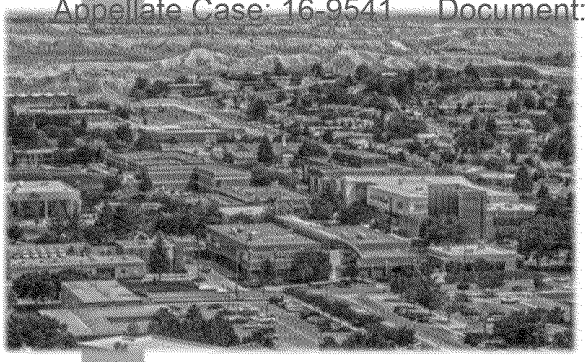
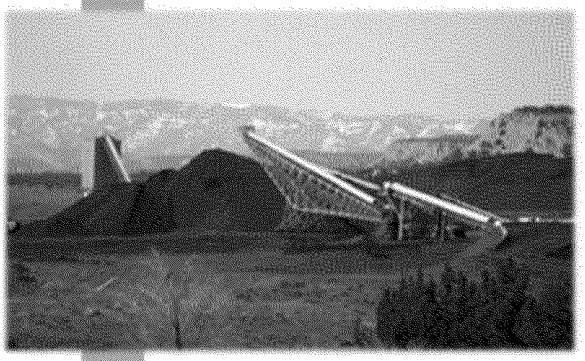
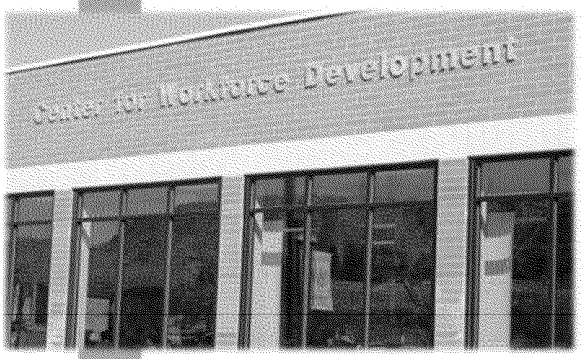
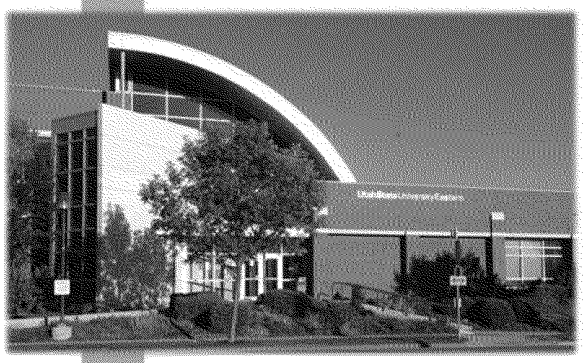
Exhibit A
State of Utah v. EPA, Consolidated Case Nos. 16-9541, 16-9542, 16-9543, 16-9545

South Eastern Utah Economic Development District, Workforce Study, March 2016 ("SEUEDD")









Workforce Study

SEUEDD

South Eastern Utah
Economic Development District

March 2016

ZIONS PUBLIC FINANCE, INC.

SEUEDD

Southeastern Utah Economic Development District

Serving Carbon, Emery, Grand, and San Juan Counties

This Report Was Prepared Under An Award From The U.S. Department of Commerce, Economic Development Administration

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Workforce Study Summary

Carbon and Emery counties are located in the eastern central region of Utah. The two counties have a combined geographic area of 5,947 square miles and a population of approximately 31,000.[1] The two counties have experienced a decrease in employment and population over the past few years, in large part due to the downturn in the coal industry, which is a major industry for the area.

The purpose of this study is to provide information that will be used to guide secondary higher, and continuing education programs to better prepare dislocated workers to obtain jobs in new industries, and to aid local economic development efforts to diversify the economy of the region.

Key findings, which will be explained throughout the report, include:

- A diversification of industries is needed to avoid over-reliance on the mining industry
- Industries that should be pursued based on current and future employment needs:
    - Information Technology
        - Support to growing tech businesses in Salt Lake and Utah counties
    - Manufacturing
        - There are multiple opportunities to attract manufacturing facilities to the area
        - Composites manufacturing is strong in Utah and some companies have already located in the area
    - Supply Chain Management and Transportation
        - There is an absence of technology and transit means to bring product to market in a quicker, more efficient way
    - Education
        - Increased demand for educators, especially in rural Utah
    - Other support industries
        - Healthcare, particularly nurses
- Growing industries based on enrollment trends in applied technology center (ATC), concurrent enrollment (CE), and career and technical education (CTE) programs:
    - Education
    - Business
    - Engineering
    - IT
- Gaps exist between the workforce needed and the workforce that is being trained, primarily for electrical positions (both electricians and engineers), educators, transportation, and construction. While more individuals are being trained in IT,; there is a lack of IT jobs in the area, indicating a key industry to target.

Demographics

Population Growth

Utah is one of the most-rapidly-growing states in the nation, having grown by 8.4 percent since 2010. However, while Utah is growing rapidly, growth projections for Carbon and Emery counties are much slower, with total population growth of approximately 2,500 persons by 2040, or a total

[1] Sources: Governor's Office of Management and Budget: 32,370; Utah Department of Transportation Traffic Analysis Zones: 31,842; US Census Bureau July 1, 2015 Estimate: 30,849

population of nearly 35,000 persons at that time. The current population is approximately 31,000 persons, with roughly 2/3 of that population in Carbon County and 1/3 located in Emery County.[2]

Demographic Characteristics

Compared to the nation, Utah has the largest household sizes and youngest median age. Household sizes in Carbon and Emery counties are not as large as the statewide average, and the median age in the two counties is not quite as young as statewide.

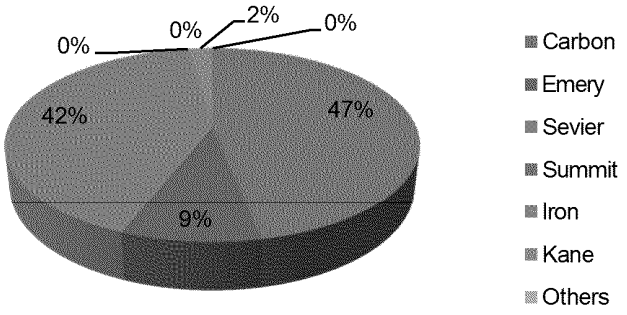
Utah has the largest household size in the nation at 3.16 persons compared to 2.65 persons nationally. Household sizes in Carbon and Emery counties, at 2.61 and 2.96 persons respectively, are closer to national trends.

While Utah has the largest household size nationally, it also has the youngest median age, suggesting there are more young families with children in Utah. The median age in Utah is 29.9 years, while the median age in Carbon County is 34.3 years and 34.0 years in Emery County. The median age nationwide is 37.4 years.

Employment

Carbon and Emery counties are known for their reliance on mining. In terms of coal production statewide, Carbon County is the largest producer at 47 percent, followed by Emery County at 9 percent. Combined, the two counties account for 56 percent of all coal production in the State of Utah. Therefore, the counties have been hit hard by the decline in mining employment.

Figure S1: Coal Production in Utah by County, 2015



Mining employment in Carbon County has declined steadily, by approximately 163 jobs, over the past three years. This represents a decrease of 21 percent in mining. Jobs in other sectors have held more steady, showing job growth in the Construction sector, Education Services, Accommodation & Food Services, Health Care/Social Assistance and in Retail Trade.

Emery County has been harder hit by the loss of mining jobs – a total of 156 jobs that represent a decline of 36 percent in mining over the past three years. In addition, there were job losses in every other industry sector, with the exception of Accommodation & Food Services.

The largest employers in Carbon County include Castleview Hospital, Utah State University Eastern and Wal-Mart. Major employers in Emery County reflect the importance of the energy industry for that county: Energy West Mining Company, Nielson Construction and Castle Valley Mining. Not surprisingly, Emery County has been particularly hard hit by the downturn in the energy industry.

Nearly one-fourth of Emery County workers are commuting to work in places outside of Emery County. This is roughly double the percentage of commuters leaving Carbon County. These

[2] Sources: Governor's Office of Management and Budget: 32,370; Utah Department of Transportation Traffic Analysis Zones: 31,842; US Census Bureau July 1, 2015 Estimate: 30,849

statistics reflect the importance of job creation closer to home. The average travel time to work for Carbon County commuters is 16 minutes and 18.5 minutes in Emery County. However, 29 percent of the population in Emery County has a travel time of 25 minutes or longer, while only 19 percent of the Carbon County population commutes for 25 minutes or more.

Education
Trends indicate that the workforce is becoming increasingly more educated. In Carbon County, the percent of the population with a college degree has increased to 58 percent – up from 55 percent in 2009; in Emery County the percentage has increased to 56 percent (up from 45 percent in 2009; statewide the percentage has increased to 67 percent (up from 64 percent in 2009). So, while educational levels are increasing in Carbon and Emery counties, they are still below the State average.

Average Wages
Highest-paying wages for Carbon County, as of 2015, are in Mining, followed by Utilities. It is interesting that the average wage paid in Mining is higher in 2015 than in 2012, suggesting that the job losses occurred in the lower-paying positions. However, the average mining wage in Emery County has declined significantly since 2012 (from $6,299 to $4,964) reflecting the closure of at least one mine, and the temporary lack of expansion of others.

Mining Industry Trends

National/Global Trends
Sentiment in the national and global mining markets trended downwards in 2015, continuing a pattern that has extended more than three years. Prices for raw materials have declined to levels last seen in 2008 and 2009, a period which was largely deemed as a low spot in mining history.

Several factors are driving the decline in the national and global mining markets, the most significant of which is global economic weakness associated with China. Since 2000, China has been a voracious consumer of materials, including aluminum, copper, nickel, zinc, and coal, amongst others. Robust economic growth propelled Chinese developments, while world mining producers scrambled to maintain necessary supply. In recent years, particularly in 2015, a significant decline in Chinese markets has resulted in an oversupply of materials globally, and a concurring decline in prices.

Economic indicators within the mining industry anticipate the following for 2016:

- Further declines in prices for aluminum, zinc, and lead;
- Potential price increases for nickel, due to limited supply; and
- Possible year-end price increases for copper, albeit nominal.

More long-term forecasts show an eventual change in the consumption of fossil fuels, with an eventual greater dependence upon natural gas and renewable sources (wind, solar, biomass, etc.). Global coal consumption is anticipated to continue to rise until roughly 2020, with environmental restrictions thereafter resulting in an increased usage of alternative sources. Highlights from the global fossil fuels market include:

- Current downward pressures on coal pricing due to declining needs from the Chinese market. China accounts for roughly 50 percent of global coal consumption;

- Coal use worldwide expanded sharply in roughly 2003, and several emerging markets experienced robust growth and needs for energy sources. Growth is still anticipated for coal until roughly 2020, while alternative sources are estimated to gain market share at that time. Nonetheless, predictions for significant coal consumption worldwide continue past 2040; and
- Roughly 31 percent of global electricity needs are anticipated to be met by coal in 2040.

Local/Utah Mining Trends

The Utah mining market largely follows global and national trends, with current conditions revealing depressed prices. Additionally noted for Utah is the impact of political pressures that influence the ability of regional and local mining companies to expand. Highlights for local trends include the following;

- According to the Department of Energy, roughly 80% of the electricity generated in Utah comes from coal (as of 2015);
- Approximately 17 million tons of coal are produced annually, with sales in 2014 of $570.8 million (from coal produced on Federal lands). Royalty revenues for the same period for coal were reported at $41.1 million;
- The State produces roughly 1.5 to 2.0% of U.S. coal, with roughly 27% of that production being used out of State;
- Utah has seven operating mines that produce coal from roughly 71 leases, covering approximately 83,000 acres, according to the Department of Energy. Present projections suggest that the existing mines have roughly 15 years of reserves at the present rate of production (and using the existing methods of mining), while additional leasing could extend the life of Central Utah coal fields by 40 to 50 years, depending on coal prices;
- As of 2015, Carbon County had four of the state's seven coal mines, while Emery County had two coal mines;
- Notable, however, is that new coal leases are presently prohibited, with the United States government placing a moratorium on such activity until the coal leasing program is better analyzed. Consequently, local companies wishing to expand are now postponing any plans of growth;
- The local labor force (in Carbon and Emery Counties) has felt the impacts of weakness in the global and national mining markets. Roughly 150 mining jobs have been lost in Emery County in the past three years, while approximately 160 mining jobs have been lost in Carbon County since 2012; and
- Kennecott (Rio Tinto) significant layoffs in Utah in 2016 due to low copper prices and unfavorable mining conditions. It also anticipates that copper needs may not escalate until mid-2017. In early March 2016, Kennecott laid off 200 workers, resulting in a total of nearly 300 since the end of 2015.

Both nationally and locally, mining experts indicate a need for companies to become more innovative in order to survive declining prices. Improvements are noted to be necessary for supply chain management, and specifically, the speed and ease at which products are brought to market. Industry analysts forecast the potential for increased job growth throughout Utah in fields which specialize in supply chain economics and delivery for mining product.

Occupational and Skills Analysis

Missing Skills in the Workforce
Employers in the area indicated that, on average, only 45 percent of applicants from the local area have the skills, training, certificates, or degrees required for the position for which they are applying. While some of the skills lacking, like a strong work ethic, cannot be taught in a classroom or other work setting, other skills can. Some of the skills lacking include:

- Communication
- Computer and technology
- Technical programs (e.g., welding, machine shop, electrical, etc.)
- Management

"Although we have ultimately been successful, it has been difficult to hire locally because many of the applicants lack essential soft skills, primarily written and verbal communication skills."

Current and Future Employment Needs

Businesses in the area have a variety of current and future employment needs. Some of these needs are outlined below:

Table S1: Current Employment Needs and Requirements

Industry	Employment Needs	Required skills, training, degrees, or certifications
Education	Building Maintenance	No degree, license, or certification required (unless working with asbestos), specialized skills and experience in HVAC, electrical, plumbing, building construction, or auto maintenance preferred
Education	CTE Instructor	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Custodian	None
Education	School Administrator	Utah School Administrator/Supervisor License, Master's Degree in School Administration
Education	Special Education Teacher	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Speech and Hearing Teacher	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Teachers(Art, Geography, Math, Music, Science)	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Teaching Assistant	Associates Degree, ParaPro Assessment Test
Healthcare	Nurse	Degree in Nursing and licensure
IT	Programmer	Technical training
IT	Web Designer	Technical training
IT	Database Engineer	Technical training
Oil, Gas & Mining/Manufacturing	Apprentice Electrician	None, electrical training preferred
Oil, Gas & Mining/Manufacturing	Electrical Engineer	Degree in Electrical Engineering
Oil, Gas &	Journeyman Electrician	Electrician Certification

Industry	Employment Needs	Required skills, training, degrees, or certifications
Mining/Manufacturing		
Manufacturing	Chemical Engineer	Degree in Chemical Engineering
Professional, Scientific, & Technical Services	Communications Assistant (entry-level position)	Type 30 WPM, pass entry-level dictation exam
Utilities/Energy	Power Plant Manager	Management experience
Utilities/Energy	Utility Workers	None

Opportunities for Job Growth

There are several opportunities for job growth in a variety of industries that could be pursued in Carbon and Emery counties. These industries include:

- Other Mining
- Information Technology
- Manufacturing/Re-manufacturing
- Supply Chain Management, Logistics, and Delivery Systems
- Warehousing and Distribution
- Energy
- Education
- Healthcare
- Tourism and Other Non-basic industries

Several employers indicate the need for streamlining the mining process, from extraction to eventual delivery. Consequently, a variety of job opportunities may be presented if current political stalemates are overcome and leasing efforts are renewed. With increased scrutiny on distribution of coal, particularly to neighboring states and outside of the country, supply chain management and product delivery specialists will be required. Mining companies will need to be more innovative in order to compete with low prices and limited demand.

Employment Needs and Available Workforce Gap

In 2015, there were 1,889 jobs postings in Carbon and Emery counties on the Department of Workforce Services website. Of the total postings, 1,690, or 89 percent, were in Carbon County.

Table 2 compares the workforce needs (jobs posted in 2015) with the number of students enrolled in various programs (ATC and CTE) to determine what gaps, if any, exist.[3] There is a gap between the number of postings and the workforce that is being trained for most of the positions. However, more welders are being trained than welding positions that are available. Furthermore, many individuals are seeking IT training; however, there are few jobs to fill the supply. There is a growing workforce of individuals with IT skills that could be used to attract IT businesses to the area.

Table S2: Employment Needs and Available Workforce Gap Comparison

Job Title	2015 Job Postings	Enrollment				Difference[4]
		USU Eastern	CWD	Carbon CTE	Emery CTE	
Teacher	60	55	0	0	0	5
Electrician	46	1	0	0	0	45

[3] The difference assumes 100 percent retention in Carbon and Emery counties.
[4] Difference = 2015 Job Postings – total enrollees from each institution

Job Title	2015 Job Postings	Enrollment				Difference[4]
		USU Eastern	CWD	Carbon CTE	Emery CTE	
Electrical Engineer	6	4	0	0	0	2
Other Engineers	17	17	0	0	0	0
Other Electronics	13	3	0	0	0	10
Welding	32	25	28	25	79	-125
Construction	132	0	10	0	23	99
Heavy Equipment & Trucking	169	60	0	0	0	109
IT	17	17	96	438[5]	50	-584
Machinist	3	5	0	0	12	-14
Nursing	22	9	0	0	0	13

[5] There are 438 students enrolled in Information Technology, with accumulative course enrolment of 581; therefore, each Information Technology student enrolled in 1.3 Information Technology courses. Overall, the average CTE student enrolled in 2.67 CTE courses.

Introduction

Carbon and Emery counties are located in the eastern central region of Utah. The two counties have a combined geographic area of 5,947 square miles and a population of approximately 31,000.[6] The two counties have experienced a decrease in employment and population over the past few years, in large part due to the downturn in the coal industry, which is a major industry for the area.

The purpose of this study is to provide information that will be used to guide secondary, higher, and continuing education programs to better prepare dislocated workers to obtain jobs in new industries, and to aid local economic development efforts to diversify the economy of the region.

This report is separated into 5 sections:

- Demographics: An analysis of the study area's demographics, including population and employment
- Mining Industry Trends: Includes both national and regional trends
- Occupational and Skills Analysis: Outlines current employment needs and opportunities for employment going forward, as well as the skills needed for those positions
- Educational and Skills Trends: Analyzes trends in enrollment in various college, applied technology center (ATC), concurrent enrollment (CE), and career and technical education (CTE) programs
- Employment Needs and Available Workforce Gap Analysis: Compares and identifies gaps between the number of positons posted for various industries and the number of individuals being trained that could fill those positions

Summary of Findings

Key findings, which will be explained throughout the report, include:

- A diversification of industries is needed to avoid over-reliance on the mining industry
- Industries that should be pursued based on current and future employment needs:
  - Information Technology
    - Support to growing tech businesses in Salt Lake and Utah counties
  - Manufacturing
    - There are multiple opportunities to attract manufacturing facilities to the area
    - Composites manufacturing is strong in Utah and some companies have already located in the area
  - Supply Chain Management and Transportation
    - There is an absence of technology and transit means to bring product to market in a quicker, more efficient way
  - Education
    - Increased demand for educators, especially in rural Utah
  - Other support industries
    - Healthcare, particularly nurses
- Growing industries based on enrollment trends in applied technology center (ATC), concurrent enrollment (CE), and career and technical education (CTE) programs:
  - Education
  - Business

[6] Sources: Governor's Office of Management and Budget: 32,370; Utah Department of Transportation Traffic Analysis Zones: 31,842; US Census Bureau July 1, 2015 Estimate: 30,849

- Engineering
- IT

- Gaps exist between the workforce needed and the workforce that is being trained, primarily for electrical positions (both electricians and engineers), educators, transportation, and construction. Contrarily, more individuals are being trained in IT; however, there is a lack of IT jobs in the area, indicating a key industry to target.

Table 1: Current Employment Needs and Requirements

Industry	Employment Needs	Required skills, training, degrees, or certifications
Education	Building Maintenance	No degree, license, or certification required (unless working with asbestos), specialized skills and experience in HVAC, electrical, plumbing, building construction, or auto maintenance preferred
Education	CTE Instructor	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Custodian	None
Education	School Administrator	Utah School Administrator/Supervisor License, Master's Degree in School Administration
Education	Special Education Teacher	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Speech and Hearing Teacher	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Teachers(Art, Geography, Math, Music, Science)	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Teaching Assistant	Associates Degree, ParaPro Assessment Test
Healthcare	Nurse	Degree in Nursing and licensure
IT	Programmer	Technical training
IT	Web Designer	Technical training
IT	Database Engineer	Technical training
Oil, Gas & Mining/Manufacturing	Apprentice Electrician	None, electrical training preferred
Oil, Gas & Mining/Manufacturing	Electrical Engineer	Degree in Electrical Engineering
Oil, Gas & Mining/Manufacturing	Journeyman Electrician	Electrician Certification
Manufacturing	Chemical Engineer	Degree in Chemical Engineering
Professional, Scientific, & Technical Services	Communications Assistant (entry-level position)	Type 30 WPM, pass entry-level dictation exam
Utilities/Energy	Power Plant Manager	Management experience
Utilities/Energy	Utility Workers	None

Demographics

Population Growth

Utah is one of the most-rapidly-growing states in the nation, having grown by 8.4 percent since 2010. Only four states have grown at faster rates – North Dakota, District of Columbia, Texas and Colorado. This bodes well for economic development and the creation of a strong workforce.

Table 2: Five Fastest-Growing States (Source: US Census Bureau)

State	Population Growth Since 2010
North Dakota	12.5%
District of Columbia	11.7%
Texas	9.2%
Colorado	8.5%
Utah	8.4%

Utah's population reached an estimated 3,000,000 persons in October 2015. It took 20 years for the population to increase from 2,000,000 to 3,000,000; however, the next one million increase in population is expected to take only 16 years (by 2031). Utah grows by natural increase (2/3 of total growth), as well as in-migration (1/3 of total growth).

The most rapidly-growing counties in Utah since 2010 are:

- Wasatch (17.8%)
- Uintah (13.1%)
- Morgan (12.0%)
- Washington (10.0%)
- Duchesne (9.5%)

The only counties in Utah with declining growth rates since 2010 are:

- Piute (-4.6%)
- Carbon (-3.5%)
- Emery (-3.1%)
- Garfield (-2.9%)
- Beaver (-2.5%)
- Wayne (-2.0%)
- Sevier (-0.1%)

Wasatch and Morgan counties, which had extremely high population growth between 2010 and 2014, also have a significant portion of the population that do not work in their respective counties. This suggests that although the population has increased in these areas, it is not due to economic development and job growth in the counties; rather, these are bedroom communities that support job growth along the Wasatch Front.

Table 3: Population Change and Percent of Workers Working Outside County of Residence (Source: ACS 2014)

County	Population Change (2010-2014)	Percent of Workers Working Outside of County of Residence					
		2010	2011	2012	2013	2014	Change 2010-2014
Wasatch	17.8%	41.4%	42.9%	46.1%	44.7%	46.0%	4.7%
Uintah	13.1%	7.5%	8.7%	7.8%	8.4%	8.4%	0.9%

County	Population Change (2010-2014)	Percent of Workers Working Outside of County of Residence					
		2010	2011	2012	2013	2014	Change 2010-2014
Morgan	12.0%	60.5%	63.1%	63.2%	63.8%	65.1%	4.6%
Washington	10.0%	2.5%	2.5%	2.7%	2.4%	2.5%	0.0%
Duchesne	9.5%	15.2%	16.9%	18.1%	17.5%	15.5%	0.3%
Sevier	-0.1%	8.7%	8.2%	8.8%	7.9%	6.8%	-1.9%
Wayne	-2.0%	8.0%	8.5%	8.1%	7.4%	6.9%	-1.0%
Beaver	-2.5%	8.1%	10.9%	12.4%	12.3%	10.6%	2.5%
Garfield	-2.9%	7.8%	5.5%	4.9%	8.2%	10.7%	3.0%
Emery	-3.1%	24.7%	23.4%	22.4%	22.6%	21.2%	-3.5%
Carbon	-3.5%	10.2%	11.0%	10.2%	9.9%	10.3%	0.1%
Piute	-4.6%	34.8%	27.2%	26.9%	28.8%	28.5%	-6.4%

Population Growth Projections

Two sources have been used to estimate population growth for Carbon and Emery Counties: Traffic Area Zone projections, as provided by UDOT; and population projections from the Governor's Office of Management and Budget. Both sources provide fairly similar results, although the GOMB figures cover the time period from 2010 to 2040, and the TAZ data extends from 2011 to 2040. Projected growth rates for both counties are extremely low, especially considering the rapid growth rates being experienced in other parts of Utah.

Table 4: Comparison of Carbon and Emery County Growth Projections through 2040 (Source: GOMB; UDOT; ZPFI)

	2010	2011	2040	Actual Growth	AAGR*
Carbon County					
TAZ		20,882	22,230	1,348	0.22%
GOMB	21,403		22,860	1,457	0.22%
Emery County					
TAZ		10,960	12,070	1,110	0.33%
GOMB	10,976		12,207	1,231	0.35%
Carbon & Emery Counties					
TAZ		31,842	34,300	2,458	0.26%
GOMB	32,379		35,067	2,688	0.27%

*Average annual growth rate

A breakout of the growth projections in each County is provided below, showing that the strongest growth is projected for Price City.

Table 5: Carbon and Emery County Growth Projections through 2040 (Source: UDOT)

	2011	2024	2034	2040	Grand Total
Carbon County					
Balance of Carbon County	7,304	7,422	7,620	7,775	471
East Carbon	1,269	1,290	1,324	1,351	82
Helper	2,148	2,182	2,241	2,286	139
Price	8,503	8,641	8,871	9,052	549
Scofield	23	24	24	25	2

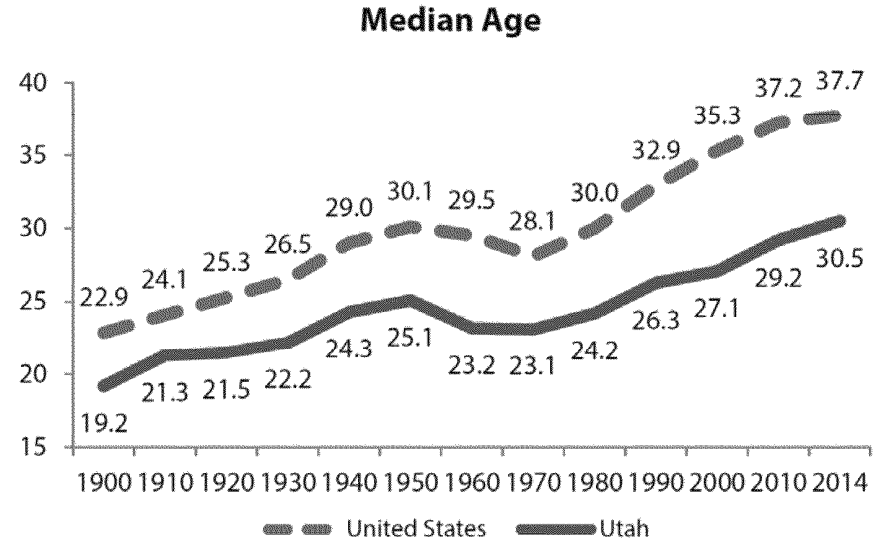
	2011	2024	2034	2040	Grand Total
Wellington	1,635	1,662	1,706	1,741	106
Total Carbon County	20,882	21,221	21,786	22,230	1,348
Emery County					
Balance of Emery County	1,600	1,630	1,673	1,687	87
Castle Dale	1,628	1,698	1,771	1,792	165
Clawson	163	170	177	179	16
Cleveland	463	483	504	510	47
Elmo	417	435	454	460	42
Emery	288	300	313	317	29
Ferron	1,624	1,694	1,767	1,788	165
Green River	951	992	1,034	1,047	96
Huntington	2,359	2,501	2,634	2,674	314
Orangeville	1,468	1,532	1,597	1,616	149
Total Emery County	10,960	11,435	11,925	12,070	1,110
TOTAL Carbon & Emery	31,842	32,656	33,711	34,300	2,458

Demographic Characteristics

Median Age

While Utah has the largest household size nationally, it also has the youngest median age, suggesting there are more young families with children in Utah. Carbon and Emery are both below the national median but above the state median.

Figure 1: Utah Median Age (Source: ACS 2014)



Source: U.S. Census Bureau, Decennial Census; 2014 American Community Survey

Table 6: Median Age (Source: ACS 2014)

Area	Median Age
Carbon County	34.3
Emery County	34.0

Area	Median Age
State of Utah	29.9
United States	37.4

Household Size
Utah has the largest household size in the nation at 3.14 persons compared to 2.63 persons nationally. Carbon is near the national average, and Emery is slightly above the national average but below the state average.

Table 7: Average Household Size (Source: ACS 2014)

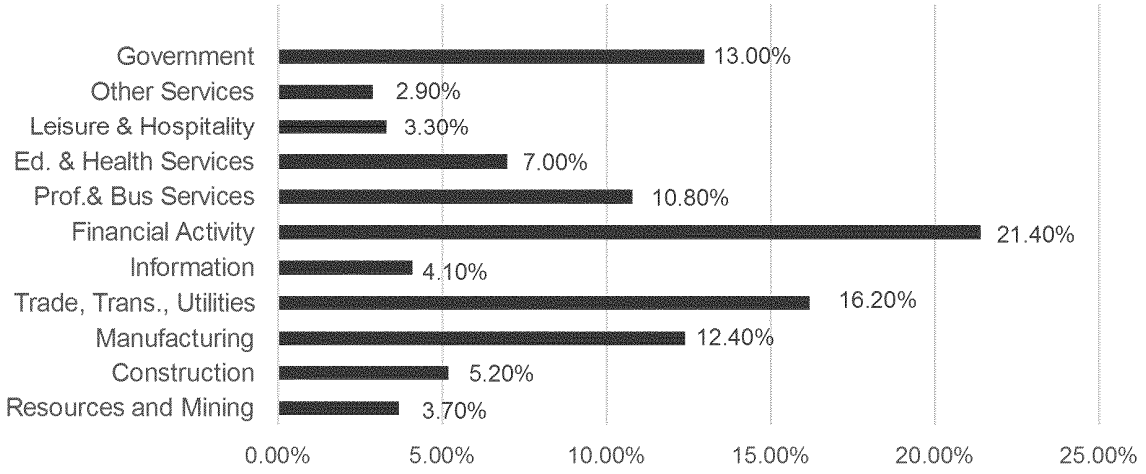
Area	Household Size
Carbon County	2.61
Emery County	2.96
State of Utah	3.14
United States	2.63

Employment

Utah's nonagricultural employment increased 3.2 percent from December 2014 to December 2015, or by a total of 43,000 jobs.

Mining is one of the smallest industry sectors in the workforce in the State of Utah, yet it is the one of the largest sectors in Carbon and Emery counties.

Figure 2: Percent of Total Gross Domestic Product By Industry - Utah



Utah's unemployment rate was 3.5 percent in December 2015, below that of 3.6 percent in December 2014. The national unemployment rate was 5.0 percent in December 2015.
Net job losses in Utah from December 2014 to December 2015 were noted in natural resources and mining (-1,100 jobs) and other services (-1,500 jobs). Increases in employment in Utah were highest for Education and Health Services (11,300 jobs), Leisure and Hospitality (8,700 jobs), Manufacturing (4,900 jobs), and Construction (4,200 jobs).

The Carbon County workforce, over the past two years, shows the following employment pattern. However, it is somewhat misleading as many people are leaving the area to find employment elsewhere.

Table 8: Carbon County Employment, 2014-2016

Period/year	Month	Labor Force	Employment	Unemployment	Unemployment Rate
2015	December	8,710	8,233	477	5.5%
2015	November	8,697	8,242	455	5.2%
2015	October	8,693	8,233	460	5.3%
2015	September	8,716	8,239	477	5.5%
2015	August	8,637	8,061	576	6.7%
2015	July	8,945	8,355	590	6.6%
2015	June	9,102	8,550	552	6.1%
2015	May	8,994	8,539	455	5.1%
2015	April	8,771	8,359	412	4.7%
2015	March	8,835	8,380	455	5.1%
2015	February	8,764	8,286	478	5.5%
2015	January	8,638	8,169	469	5.4%
2014	December	8,657	8,282	375	4.3%
2014	November	8,679	8,316	363	4.2%
2014	October	8,703	8,310	393	4.5%
2014	September	8,635	8,239	396	4.6%
2014	August	8,578	8,059	519	6.1%
2014	July	8,633	8,123	510	5.9%
2014	June	8,868	8,378	490	5.5%
2014	May	8,733	8,316	417	4.8%
2014	April	8,695	8,294	401	4.6%
2014	March	8,729	8,229	500	5.7%
2014	February	8,735	8,211	524	6.0%
2014	January	8,767	8,250	517	5.9%

Table 9: Emery County Employment, 2014-2016

Period/year	Month	Labor Force	Employment	Unemployment	Unemployment Rate
2015	December	4,323	4,040	283	6.5%
2015	November	4,353	4,110	243	5.6%
2015	October	4,345	4,093	252	5.8%
2015	September	4,320	4,070	250	5.8%
2015	August	4,407	4,108	299	6.8%
2015	July	4,507	4,215	292	6.5%
2015	June	4,531	4,238	293	6.5%
2015	May	4,520	4,283	237	5.2%
2015	April	4,570	4,365	205	4.5%
2015	March	4,595	4,360	235	5.1%
2015	February	4,585	4,329	256	5.6%
2015	January	4,416	4,163	253	5.7%
2014	December	4,389	4,185	204	4.6%
2014	November	4,431	4,236	195	4.4%
2014	October	4,517	4,320	197	4.4%
2014	September	4,487	4,283	204	4.5%
2014	August	4,572	4,335	237	5.2%
2014	July	4,652	4,412	240	5.2%
2014	June	4,778	4,530	248	5.2%
2014	May	4,803	4,577	226	4.7%
2014	April	4,876	4,656	220	4.5%

Period/year	Month	Labor Force	Employment	Unemployment	Unemployment Rate
2014	March	4,667	4,379	288	6.2%
2014	February	4,605	4,295	310	6.7%
2014	January	4,586	4,259	327	7.1%

As the table below demonstrates, Mining employment in Carbon County has declined steadily, by approximately 163 jobs, over the past three years. This represents a decrease of 21 percent in mining. Jobs in other sectors have held more steady, showing job growth in the Construction sector, Education Services, Accommodation & Food Services, Health Care/Social Assistance and in Retail Trade.

Table 10: Carbon County Employment by Industry Sector

Carbon County	Average Employment 2015 3Q	Average Employment 2014 3Q	Average Employment 2013 3Q	Average Employment 2012 3Q
Mining	618	683	668	781
Utilities	130	158	159	166
Construction	534	439	426	465
Finance & Insurance	156	177	194	198
Education Services	922	888	861	888
Accommodation & Food Services	723	685	678	636
Health Care/Social Assistance	1,180	1,079	1,107	1,072
Retail Trade	1,134	1,127	1,170	1,111

Emery County has been harder hit by the loss of mining jobs – a total of 156 jobs that represent a decline of 36 percent over the past three years. In addition, there were job losses in every other sector, with the exception of Accommodation & Food Services.

Table 11: Emery County Employment by Industry Sector

Emery County	Average Employment 2015 3Q	Average Employment 2014 3Q	Average Employment 2013 3Q	Average Employment 2012 3Q
Mining	272	381	487	428
Utilities	398	410	422	420
Construction	394	390	410	403
Finance & Insurance	41	45	43	46
Education Services	358	372	375	349
Accommodation & Food Services	350	295	280	283
Health Care/Social Assistance	178	176	198	191

Emery County	Average Employment 2015 3Q	Average Employment 2014 3Q	Average Employment 2013 3Q	Average Employment 2012 3Q
Retail Trade	477	479	465	482

Changes in the number of jobs by industry sector are shown in the following two tables, with industries that experienced an increase between 2011 and 2014 marked in bold.

Table 12: Carbon County Workforce, 2005-2014

	Actual Growth				Percent Growth			
Industry Sector	2005-2008	2008-2011	2011-2014	2005-2014	2005-2008	2008-2011	2011-2014	2005-2014
Mining	507	(329)	(297)	(119)	64%	-25%	-31%	-15%
Utilities	-	(3)	(18)	(21)	0%	-2%	-10%	-12%
Construction	53	91	(44)	100	16%	24%	-9%	31%
Manufacturing (31-33)	(40)	(19)	(15)	(74)	-10%	-5%	-4%	-18%
Wholesale Trade	30	34	(125)	(61)	7%	7%	-25%	-14%
Retail Trade (44 & 45)	1	(136)	5	(130)	0%	-11%	0%	-10%
Transportation and Warehousing (48 & 49)	80	53	72	205	18%	10%	12%	45%
Information	(8)	(16)	(20)	(44)	-7%	-15%	-21%	-37%
Finance and Insurance	6	1	(24)	(17)	3%	0%	-12%	-9%
Real Estate and Rental and Leasing	33	(12)	(21)	-	62%	-14%	-28%	0%
Professional Scientific & Technical Svc	(10)	9	7	6	-5%	5%	3%	3%
Admin., Support, Waste Mgmt, Remediation	(66)	132	(59)	7	-18%	44%	-14%	2%
Education Services	(8)	(74)	-	(82)	-1%	-7%	0%	-7%
Health Care and Social Assistance	129	(31)	50	148	14%	-3%	5%	16%
Arts, Entertainment, and Recreation	-	20	(2)	18	0%	18%	-2%	16%
Accommodation and Food Services	43	(30)	8	21	6%	-4%	1%	3%
Other Services (except Public Admin.)	(4)	(19)	(22)	(45)	-1%	-5%	-7%	-13%
Public Administration	(13)	21	(61)	(53)	-2%	2%	-7%	-6%
TOTAL	730	(341)	(554)	(165)	8%	-4%	-6%	-2%

Table 13: Emery County Workforce, 2005-2014

	Actual Growth				Percent Growth			
Industry Sector	2005-2008	2008-2011	2011-2014	2005-2014	2005-2008	2008-2011	2011-2014	2005-2014
Mining	(148)	(222)	(72)	(442)	-18%	-33%	-16%	-54%
Utilities	(18)	(10)	(3)	(31)	-4%	-2%	-1%	-7%
Construction	159	30	(26)	163	55%	7%	-5%	56%
Manufacturing (31-33)	4	(6)	(2)	(4)	18%	-23%	-10%	-18%
Wholesale Trade	(14)	(15)	3	(26)	-32%	-50%	20%	-59%

Industry Sector	Actual Growth 2005-2008	2008-2011	2011-2014	2005-2014	Percent Growth 2005-2008	2008-2011	2011-2014	2005-2014
Retail Trade (44 & 45)	42	(7)	8	43	10%	-2%	2%	10%
Transportation and Warehousing (48 & 49)	(87)	(3)	(12)	(102)	-52%	-4%	-16%	-61%
Information	(15)	(1)	(31)	(47)	-9%	-1%	-21%	-29%
Finance and Insurance	7	(10)	(4)	(7)	14%	-17%	-8%	-14%
Professional Scientific & Technical Svc	14	118	(121)	11	25%	171%	-65%	20%
Admin., Support, Waste Mgmt, Remediation	#N/A	#N/A	7	7	#N/A	#N/A	33%	33%
Education Services	13	20	30	63	4%	6%	8%	18%
Health Care and Social Assistance	42	(12)	(34)	(4)	23%	-5%	-16%	-2%
Accommodation and Food Services	5	(42)	16	(21)	2%	-15%	6%	-7%
Other Services (except Public Admin.)	(26)	14	(17)	29)	-17%	11%	-12%	-18%
Public Administration	(4)	(1)	1	(4)	-1%	0%	0%	-1%
TOTAL	(15)	(149)	(252)	(416)	0%	-4%	-7%	-11%

Employment Growth Projections

Two sources have been used to estimate employment growth for Carbon and Emery Counties: 1) Traffic Area Zone projections, as provided by UDOT; and 2) employment projections from the Governor's Office of Management and Budget. Both sources provide fairly similar results, although the GOMB figures cover the time period from 2010 to 2040, and the TAZ data extends from 2011 to 2040. Projected growth rates for both counties are extremely low, especially considering the rapid growth rates being experienced in other parts of Utah.

Table 14: Comparison of Carbon and Emery County Growth Projections through 2040 (Source: GOMB; UDOT; ZPFI)

	2010	2011	2040	Actual Growth	AAGR*
Carbon County					
TAZ		12,190	14,575	2,385	0.62%
GOMB	12,656		15,254	2,598	0.62%
Emery County					
TAZ		10,960	12,070	1,110	0.33%
GOMB	6,028		7,232	1,204	0.61%
Carbon & Emery Counties					
TAZ		23,150	26,645	3,495	0.49%
GOMB	18,684		22,486	3,802	0.62%

*Average annual growth rate

Tables 15 and 16 list employment growth projections by industry for Carbon and Emery counties. Based on past trends, there is very little job growth projected to occur in this area. Areas for which growth is projected include Professional & Technical Services, Health & Social Services, Construction, Administrative & Waste Services, and Arts, Entertainment, & Recreation, although the anticipated growth in these sectors is minimal.

Table 15: Carbon County Employment Projections (Source: GOMB)

Industry	2010	2020	2030	2040	AAGR 2010-2040
Natural Resources	41	43	41	40	-0.08%
Mining	1,115	732	689	661	-1.73%
Utilities	142	109	93	81	-1.85%
Construction	587	544	634	704	0.61%
Manufacturing	366	444	421	386	0.18%
Wholesale Trade	490	477	487	487	-0.02%
Retail Trade	1,446	1,603	1,652	1,714	0.57%
Transportation & Warehousing	528	555	606	647	0.68%
Information	105	103	109	117	0.36%
Finance & Insurance	379	438	460	495	0.89%
Real Estate, Rental & Leasing	369	411	422	430	0.51%
Professional & Technical Services	303	357	447	556	2.04%
Management of Companies	16	18	17	17	0.20%
Administrative & Waste Services	638	809	969	1,108	1.86%
Educational Services	233	263	280	294	0.78%
Health & Social Services	1,671	1,997	2,253	2,470	1.31%
Arts, Entertainment & Recreation	157	178	203	235	1.35%
Accommodation & Food Services	779	833	898	975	0.75%
Other Services	852	848	905	967	0.42%
State & Local Government	1,874	2,039	2,245	2,442	0.89%
Federal Civilian	172	156	158	165	-0.14%
Federal Military	95	82	76	69	-1.06%
Farm	298	263	223	194	-1.42%
Total Employment	12,656	13,302	14,288	15,254	0.62%

Table 16: Emery County Employment Projections (Source: GOMB)

Industry	2010	2020	2030	2040	AAGR 2010-2040
Natural Resources	92	88	85	84	-0.30%
Mining	917	900	904	857	-0.23%
Utilities	152	107	89	81	-2.08%
Construction	607	779	924	1,023	1.76%
Manufacturing	86	89	85	77	-0.37%
Wholesale Trade	214	234	239	238	0.35%
Retail Trade	615	651	664	689	0.38%
Transportation & Warehousing	120	135	145	156	0.88%
Information	142	154	163	174	0.68%
Finance & Insurance	168	164	175	187	0.36%
Real Estate, Rental & Leasing	94	96	99	101	0.24%

Industry	2010	2020	2030	2040	AAGR 2010-2040
Professional & Technical Services	247	298	384	476	2.21%
Management of Companies	2	2	2	2	0.00%
Administrative & Waste Services	92	128	150	173	2.13%
Educational Services	21	27	27	28	0.96%
Health & Social Services	222	302	335	366	1.68%
Arts, Entertainment & Recreation	36	44	50	58	1.60%
Accommodation & Food Services	303	344	370	401	0.94%
Other Services	417	453	484	517	0.72%
State & Local Government	826	906	999	1,089	0.93%
Federal Civilian	62	59	59	62	0.00%
Federal Military	49	45	42	38	-0.84%
Farm	544	483	410	355	-1.41%
Total Employment	6,028	6,488	6,884	7,232	0.61%

Employer and Employee Characteristics

Largest Employers

The largest employers in Carbon County are the hospital, USU Eastern, Carbon School District, and Wal-Mart – none of which are mining companies. However, several companies in the second largest employee range shown below (100-249 employees) are in the energy sector.

Table 17: Largest Employers in Carbon County

Employer	Employee Range
Canyon Fuels Company LLP	250-499
Carbon School District	250-499
Castleview Hospital LLC	250-499
Utah State University/Eastern Utah	250-499
Wal-Mart	250-499
Intermountain Electronics, Inc.	100-249
Joy Technologies, Inc.	100-249
Sorenson Communications, Inc.	100-249
Elwood Staffing	100-249
West Ridge Resources, Inc.	100-249
Associated Fresh Markets, Inc.	50-99
Cadillac LLC	50-99
Carbon County	50-99
Castle Valley Center	50-99

Energy is definitely the top employer in Emery County and the County has been particularly hard hit by the downturn in the coal industry.

Table 18: Largest Employers in Emery County

Employer	Employee Range
Emery County School District	250-499
Energy West Mining Company	250-499

Employer	Employee Range
Nielson Construction/Staker-Parsons[7]	250-499
PacifiCorp	250-499
Castle Valley Mining LLC	100-249
Emery County	50-99
Emery County Care & Rehab Center	50-99
Emery Telecom	50-99
Gas N Go	50-99
Ashworth Transfer	20-49
Brooklyn Management LLC	20-49
City of Green River	20-49

Employee Commuter Characteristics

Nearly one-fourth of Emery County workers are commuting to work in places outside of Emery County. This is roughly double the amount of commuters leaving Carbon County. County officials indicate that the increased number of individuals working outside of the Utah could be a result of miners leaving Utah to work in Wyoming mines while their families remain in Utah.

Table 19: Carbon County Commuter Data

Carbon County - Place of Work	2009	2010	2011	2012	2013	2014
Worked in state of residence	98.8%	98.8%	98.5%	98.9%	99.2%	98.7%
Worked in county of residence	90.3%	88.6%	87.5%	88.7%	89.3%	88.4%
Worked outside county of residence	8.5%	10.2%	11.0%	10.2%	9.9%	10.3%
Worked outside state of residence	1.2%	1.2%	1.5%	1.1%	0.8%	1.3%

Table 20: Emery County Commuter Data

Emery County - Place of Work	2009	2010	2011	2012	2013	2014
Worked in state of residence	99.7%	98.9%	98.8%	98.5%	98.2%	98.2%
Worked in county of residence	75.0%	74.2%	75.4%	76.1%	75.6%	77.0%
Worked outside county of residence	24.8%	24.7%	23.4%	22.4%	22.6%	21.2%
Worked outside state of residence	0.3%	1.1%	1.2%	1.5%	1.8%	1.8%

The average travel time to work for Carbon County commuters is 16 minutes and 18.5 minutes in Emery County. However, 29 percent of the population in Emery County has a travel time of 25 minutes or longer, while only 19 percent of the Carbon County population commutes for 25 minutes or more.

[7] Nielson Construction was purchased by Staker-Parsons at the beginning of 2016

Table 21: Carbon County Commute Times

Carbon County - Commute Time	2009	2010	2011	2012	2013	2014
Less than 10 minutes	38.1%	36.9%	37.3%	37.2%	39.9%	40.6%
10 to 14 minutes	20.6%	22.9%	23.3%	25.2%	25.0%	24.4%
15 to 19 minutes	11.7%	12.4%	11.5%	11.5%	11.0%	12.2%
20 to 24 minutes	6.6%	6.6%	5.8%	5.6%	4.9%	4.5%
25 to 29 minutes	2.7%	2.3%	1.9%	1.5%	1.0%	1.3%
30 to 34 minutes	8.8%	7.0%	7.9%	7.8%	7.1%	6.2%
35 to 44 minutes	1.9%	2.3%	2.8%	3.2%	2.9%	3.9%
45 to 59 minutes	4.6%	4.2%	4.5%	3.7%	3.6%	2.3%
60 or more minutes	4.9%	5.4%	5.0%	4.3%	4.5%	4.8%
Mean Travel Time to Work	17.4	17.3	17.2	16.2	15.9	16.0

Table 22: Emery County Commute Times

Emery County - Commute Time	2009	2010	2011	2012	2013	2014
Less than 10 minutes	35.6%	35.8%	34.2%	36.7%	36.9%	36.1%
10 to 14 minutes	12.0%	10.6%	11.1%	11.0%	11.7%	14.1%
15 to 19 minutes	12.1%	11.2%	11.7%	11.8%	12.3%	11.9%
20 to 24 minutes	9.4%	8.9%	10.9%	10.9%	10.4%	9.3%
25 to 29 minutes	3.7%	4.0%	4.3%	3.9%	5.1%	5.6%
30 to 34 minutes	11.5%	12.0%	12.6%	10.6%	9.3%	10.6%
35 to 44 minutes	5.0%	5.2%	4.9%	4.8%	4.7%	4.4%
45 to 59 minutes	5.8%	5.6%	4.3%	4.0%	4.1%	3.5%
60 or more minutes	4.9%	6.7%	6.1%	6.4%	5.6%	4.6%
Mean Travel Time to Work	19.6	21.0	20.4	19.9	19.1	18.5

Education

Trends indicate that the workforce is becoming increasingly more educated. In Carbon County, the percent of the population with a college degree has increased to 58 percent – up from 55 percent in 2009; in Emery County the percentage has increased to 56 percent (up from 45 percent in 2009); statewide the percentage has increased to 67 percent (up from 64 percent in 2009). So, while educational levels are increasing in Carbon and Emery counties, they are still below the State average.

Table 23: Carbon County Educational Levels

Carbon County - Educational Attainment of Population Over 18	2009	2010	2011	2012	2013	2014
Less than high school graduate	14%	14%	13%	13%	14%	13%
High school graduate (includes equivalency)	32%	31%	30%	29%	29%	29%
Some college or associate's degree	42%	43%	45%	46%	46%	47%
Bachelor's degree or higher	13%	12%	11%	12%	11%	11%

Table 24: Emery County Educational Levels

Emery County - Educational Attainment of Population Over 18	2009	2010	2011	2012	2013	2014
Less than high school graduate	11%	11%	12%	11%	10%	11%
High school graduate (includes equivalency)	44%	40%	38%	36%	34%	33%
Some college or associate's degree	34%	37%	39%	42%	45%	45%
Bachelor's degree or higher	11%	11%	12%	11%	11%	11%

Table 25: State of Utah Educational Levels

State of Utah – Educational Attainment of Population Over 18	2009	2010	2011	2012	2013	2014
Less than high school graduate	10%	10%	10%	10%	10%	10%
High school graduate (includes equivalency)	26%	26%	25%	25%	24%	24%
Some college or associate's degree	39%	39%	39%	39%	40%	40%
Bachelor's degree or higher	25%	25%	26%	26%	26%	27%

Local school districts have indicated that, while participation in career and technical education (CTE) and concurrent enrollment (CE) programs is increasing, students are not entering the workforce immediately following graduation from high school. Many factors may contribute to this, including a lack of available positions, a desire to not do hard, physical labor, and more incentives to pursue additional education.

"Despite having participated in CTE programs and working in a trade during high school, many students are deciding to pursue a degree rather than enter the workforce following graduation from high school."

Average Wages

Highest-paying wages for Carbon County, as of 2015, are in Mining, followed by Utilities. It is interesting that the average wage paid in Mining in Carbon County is higher in 2015 than in 2012, suggesting that the job losses occurred in the lower-paying positions. The opposite occurred in Emery County. The decrease in the average wage for mining in Emery County is likely a result of the closure of the Deer Creek Mine in 2015. The Deer Creek Mine was the last mine in Utah with union employees, which typically have higher wages than non-union employees. The loss of all 180 jobs, combined with the higher wages of union employees, explain the significant decrease in the average wage for mining in Emery County.

Construction and Accommodation & Food Services wages are down over the same time period, with slight increases in other industry sectors.

Table 26: Carbon County Average Monthly Wages

Sector – Carbon County	Average Monthly Wage – 2015 3Q	Average Monthly Wage – 2014 3Q	Average Monthly Wage – 2013 3Q	Average Monthly Wage – 2012 3Q
Mining	$8,774	$7,151	$6,831	$6,439
Utilities	$6,510	$6,467	$6,434	$6,362
Construction	$4,277	$4,079	$4,252	$4,508

Sector – Carbon County	Average Monthly Wage – 2015 3Q	Average Monthly Wage – 2014 3Q	Average Monthly Wage – 2013 3Q	Average Monthly Wage – 2012 3Q
Finance & Insurance	$2,885	$2,731	$2,759	$2,820
Education Services	$2,216	$2,225	$2,249	$1,893
Accommodation & Food Services	$956	$957	$979	$1,030
Health Care/Social Assistance	$2,815	$2,808	$2,830	$2,673
Retail Trade	$1,985	$1,924	$1,863	$1,904

Table 27: Emery County Average Monthly Wages

Sector – Emery County	Average Monthly Wage – 2015 3Q	Average Monthly Wage – 2014 3Q	Average Monthly Wage – 2013 3Q	Average Monthly Wage – 2012 3Q
Mining	$4,964	$6,206	$6,080	$6,299
Utilities	$7,778	$7,368	$7,052	$7,158
Construction	$4,527	$4,255	$4,089	$3,982
Finance & Insurance	$2,562	$2,367	$2,788	$2,549
Education Services	$2,973	$2,802	$2,796	$1,453
Accommodation & Food Services	$1,245	$1,225	$1,103	$1,087
Health Care/Social Assistance	$1,376	$1,403	$1,388	$1,525
Retail Trade	$1,476	$1,487	$1,452	$1,442

Average monthly wages in mining and utilities are among the highest in the two counties; therefore, this may somewhat account for why educational levels are still lower than the state average, as some students are still entering the workforce directly out of high school rather than continuing their education.

Table 28: Average Monthly Wages by Industry Sector in Carbon and Emery Counties, 2014

Industry Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Mining	$5,305	$5,437	$5,690	$5,697	$6,033	$6,620	$6,586	$6,765	$6,916	$7,544
Utilities	$5,874	$6,547	$6,500	$6,579	$6,785	$7,067	$7,054	$7,038	$7,030	$7,329
Wholesale Trade	$2,746	$3,190	$3,400	$3,841	$4,239	$4,472	$5,203	$5,076	$5,656	$5,199
Construction	$3,066	$3,875	$3,747	$3,706	$3,750	$3,991	$4,052	$4,144	$4,128	$4,924
Manufacturing	$2,834	$3,146	$3,378	$3,379	$3,373	$3,542	$3,616	$3,670	$4,032	$4,292
Admin., Support, Waste Mgmt, Remediation	$1,969	$2,420	$3,132	$1,439	$3,448	$3,498	$4,181	$3,972	$3,988	$4,044
Transportation and Warehousing	$3,246	$2,951	$3,094	$3,148	$3,385	$3,205	$3,424	$3,350	$3,577	$3,458
AVERAGE	$2,675	$2,864	$2,958	$3,148	$3,213	$3,359	$3,694	$3,304	$3,283	$3,442
Public Administration	$2,558	$2,621	$2,776	$2,906	$2,929	$2,950	$2,993	$3,029	$2,982	$3,089
Professional Scientific & Technical Svc	$1,786	$1,929	$2,235	$2,621	$3,158	$4,488	$15,656	$2,658	$2,582	$2,953
Other Services (except Public Admin.)	$2,125	$2,464	$2,574	$3,129	$3,206	$3,200	$3,162	$2,702	$2,593	$2,893

Industry Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Information	$1,955	$2,035	$2,038	$2,154	$2,195	$2,372	$2,464	$2,571	$2,655	$2,733
Finance and Insurance	$1,946	$2,089	$2,123	$2,194	$2,145	$2,275	$2,434	$2,584	$2,745	$2,694
Education Services	$2,019	$2,227	$2,356	$2,449	$2,638	$2,617	$2,412	$2,412	$2,328	$2,313
Health Care and Social Assistance	$1,536	$1,657	$1,713	$1,733	$1,897	$1,899	$1,958	$2,069	$2,132	$2,186
Retail Trade	$1,273	$1,342	$1,407	$1,490	$1,591	$1,617	$1,615	$1,710	$1,628	$1,719
Accommodation and Food Services	$767	$817	$855	$871	$928	$959	$996	$1,007	$993	$1,049
Real Estate and Rental and Leasing	$660	$726	$851	$1,781	$1,401	$641	$687	$693	$794	$904
Arts, Entertainment, and Recreation	$502	$487	$521	$542	$525	$553	$560	$554	$508	$489

Mining Industry Trends

National/Global Mining Trends

Sentiment in the national and global mining markets trended downwards in 2015, continuing a pattern that has extended more than three years. Prices for raw materials have declined to levels last seen in 2008 and 2009, a period which was largely deemed as a low spot in mining history.

Several factors are driving the decline in the national and global mining markets, the most significant of which is global economic weakness associated with China. Since 2000, China has been a voracious consumer of materials, including aluminum, copper, nickel, zinc, and coal, amongst others. Robust economic growth propelled Chinese developments, while world mining producers scrambled to maintain necessary supply. In recent years, particularly in 2015, a significant decline in Chinese markets has resulted in an oversupply of materials globally, and a concurring decline in prices.

Mining experts anticipate that the low portion of this cycle could extend for a few years. Some upward pressure on prices might be seen as production has been significantly cut, thereby resulting in reduced supplies. Nonetheless, the forecast for nearly all metal and material types include depressed prices and historically low demand.

"Just as, during the super cycle, people imagined prices would go up forever, people now imagine the market will never recover. Neither extreme represents the truth. What is true, however, is that our cycle times are lengthening. That means it could take years to adjust to current market forces—but it's still a cycle."

Phillip Hopwood, Global Leader – Mining, Deloitte Touche Tohmatsu Limited

Weakness in the national and global mining sectors is also shown by the combined market values of the top ten firms. Deloitte Touche reported that at the end of 2015, these firms had a combined market value of $280 billion, which is roughly one half of the total reflected just one year prior. Revenues and commodity prices are nearing levels last seen in 2008 and 2009, but debt on balance sheets is roughly 50 percent higher. The acquisition of debt in 2015 was notable, as weakness has now extended for several years and firms have reduced cash reserves. Cash reserves for the largest mining companies will allow for continued operations in 2016, but more regional operations will undergo significant cuts in employment and costs in the upcoming year.

Mining companies are not only experiencing tumbling demand and declining grades, but a lack of available financing. Several sources indicate that financing for new or expanded operations has all but dried up, while existing lines of credit have been tightened or have become more restrictive. With the lack of financing, regional companies have begun to announce layoffs, with some market experts suggesting that significant job reductions will occur in mid-2016.

With prolonged weakness, mining companies are turning more to innovative ways to squeeze profits and mine additional resources. Mining leaders indicate a requisite need to become innovative in delivering product to the market. Furthermore, there exists a need for technological advances to more efficiently mine resources. Companies which are capable of streamlining acquisition and obtainment will weather economic weakness.

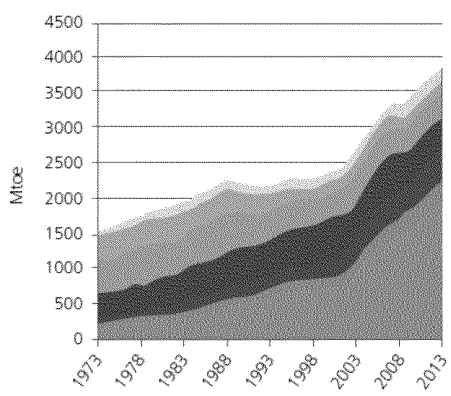
Additionally noted is the need for existing companies to better execute supply chain management policies. With tightened margins due to declining prices and increased efforts necessary to mine materials, it is imperative that getting goods to market happens in an expedited way. Numerous sources suggest the need for better rail and highway services. Environmental regulations that are being adopted in various countries (as well as within individual states in the United States) are resulting in increased scrutiny concerning distribution and distances that materials can travel.

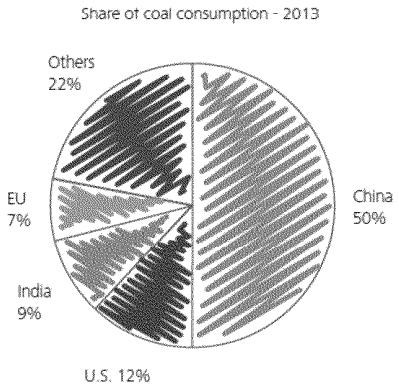
"It's interesting times in the mining industry; more interesting than many of us expected. China's economic rebalancing is causing exceptional disruption. Commodity prices are taking much longer to recover than anticipated. To my mind, this makes innovation even more imperative. Rather than being optional, being bold may be the prerequisite to survival."

Glenn Ives, Americas Mining Leader, Deloitte Canada

According to the U.S. Energy Information Administration (EIA), fossil fuels will continue to supply 80% of world energy use through 2040, while approximately 56% of electricity in 2040 will come from these sources, with coal accounting for 31% of the mix. While coal is expected to lose market share worldwide to natural gas and renewables (including wind, solar, and biomass), dropping to roughly 20% of the total global energy mix by 2040, global demand for coal is nonetheless expected to grow to nine billion tons per year by 2019, growing an average of 2.1% per year.

China is attempting to reduce its usage of coal; however, its usage is anticipated to nonetheless grow by nearly half a billion tons by 2019, despite the anticipated economic weakness. The associated graphs highlight the impact of the Chinese market on the global coal industry, as well as the rising needs of India and other Asian countries. Coal use increased significantly in roughly 2003, as developing countries enjoyed more favorable economic conditions and expanded accordingly. Some leveling-off was noted during the financial crisis years, although that trend was short-lived prior to expansion until 2013. Since that time, coal has still been heavily demanded, although year-over-year increases have become more muted.





Global coal needs face an uncertain future, as more countries are requiring a greater dependence upon renewables and natural gas. Overall, while coal demand may subside, global needs for electricity will only continue to grow.

In terms of other materials, analysts are most bullish on a global recovery for nickel (which has seen drastic price declines) in 2016, while aluminum is predicted to struggle the most of products within the metals category. Continued weakness in the Chinese market has resulted in reduced global demand for aluminum.

"Although forecasts for global energy demand are not assured, one thing is certain: there will always be a need for electricity. That means mining companies should be asking which commodities will be required across the entire power generation value chain."

Edith Alvarez, Mining Leader, Deloitte Argentina

Nickel is estimated to experience price gains in 2016 as constraints limit supply, while copper is forecast to resume some price increases by the end of 2016, with the potential of three to four percent gains. Copper miners will see further production cuts, thereby reducing an already dwindling supply. Consequently, surplus contracts will fall to less than 100,000 tons. Finally, lead is forecast for continued struggles in 2016, as well as zinc.

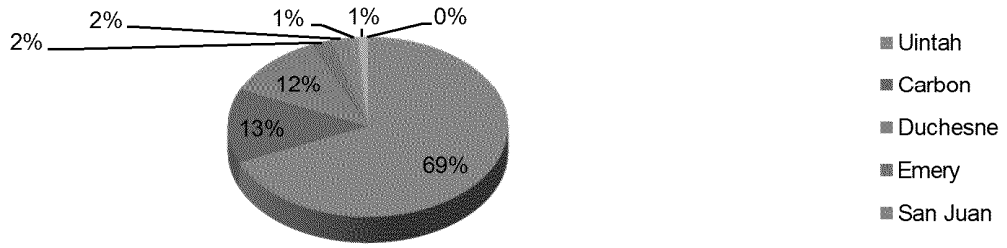
Local/Utah Mining Trends

Overall, mining conditions for Utah are relatively similar to conditions noted for global and national markets. The depressed price of materials impacts production, and concerns about bringing product to market are furthermore present. Additionally noted for Utah is the impact of political pressures that influence the ability of regional and local mining companies to expand.

According to the Department of Energy, roughly 80% of the electricity generated in Utah comes from coal (as of 2015). Approximately 17 million tons of coal are produced annually, with sales in 2014 of $570.8 million (from coal produced on Federal lands). Royalty revenues for the same period for coal were reported at $41.1 million. The State produces roughly 1.5 to 2.0% of U.S. coal, with roughly 27% of that production being used out of State.

In terms of natural gas production in Utah, Uintah County is the largest producer, followed by Carbon County which produces 13.3 percent of all natural gas statewide. Emery County produces only 2.4 percent.[8]

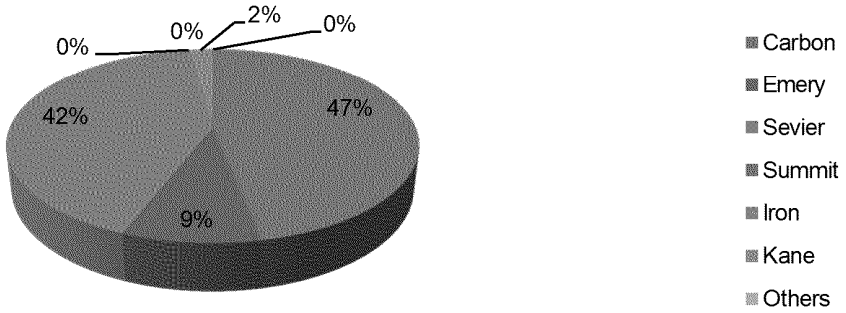
Figure 4: Natural Gas Production in Utah by County, 2014



[8] 2015 production was not available

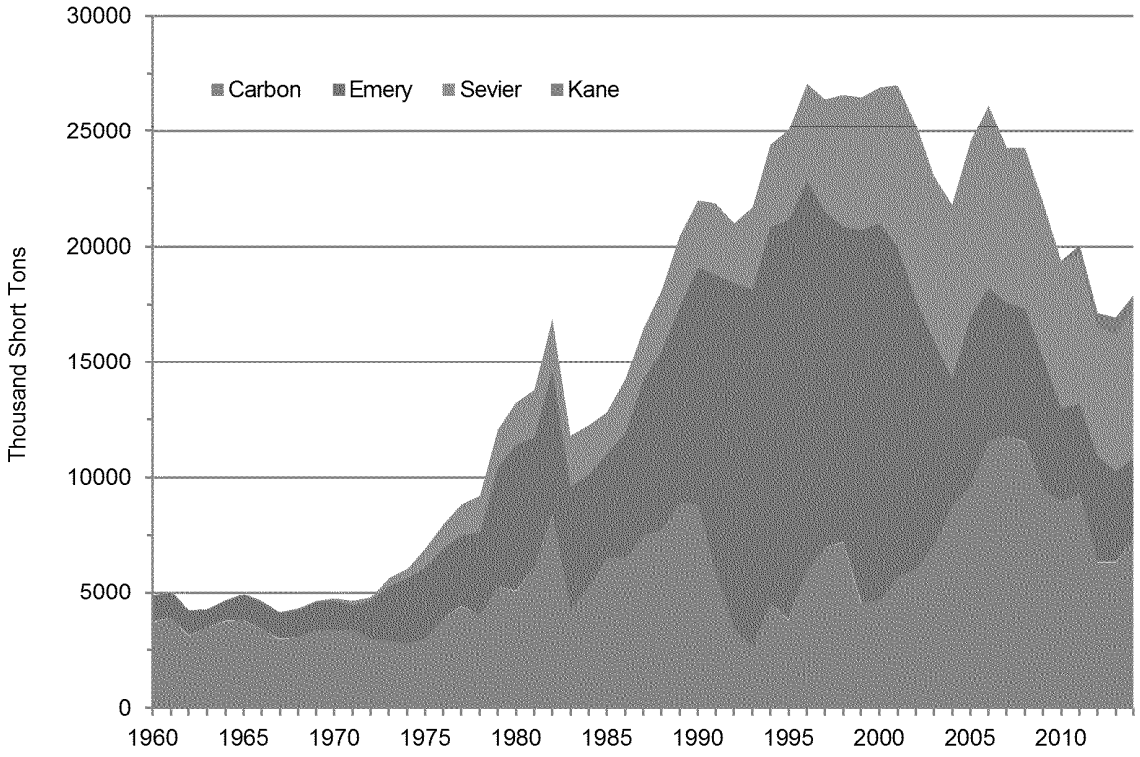
In terms of coal production statewide, Carbon County is the largest producer at 47 percent, followed by Emery County at 9 percent. Combined, the two counties account for 56 percent of all coal production in the State of Utah.

Figure 5: Coal Production in Utah by County, 2015



As noted by Figure 6, coal production in Utah is primarily contained within Carbon, Emery, Sevier, and Kane Counties. Each has followed patterns of production that largely mirror national trends, with highest production in the late nineties, followed by a few year correction, and then robust growth starting around 2003. More recent years following 2003 have shown some moderate declines in production, with all counties well below the levels produced roughly 15 to 20 years ago.

Figure 6: Coal Production in Utah by County 1960-2014 (Source: UGS/MHSA)



Coal production in Utah has decreased by 25 percent since 2010, with 2015 having the lowest production since 1986, in which 14,269 short tons were produced.[9]

Table 29: Utah Coal Production by County

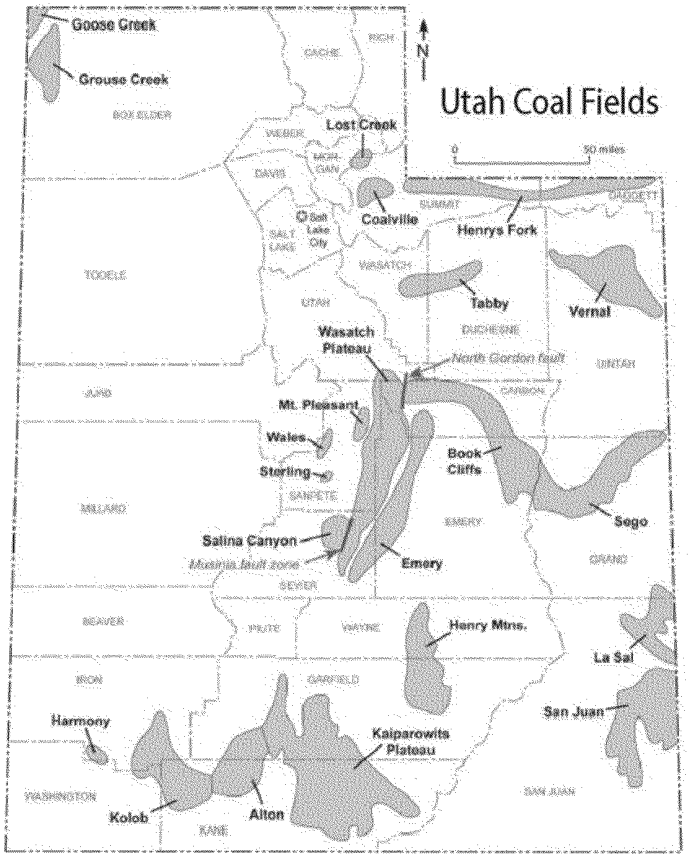
Year	Carbon	Emery	Sevier	Kane	Total
2010	8,982	4,026	6,398	0	19,406
2011	9,281	3,891	6,498	403	20,073
2012	6,331	4,603	5,651	570	17,155
2013	6,326	3,921	5,959	747	16,953
2014	7,360	3,479	6,539	555	17,933
2015	6,752	1,331	6,024	327	14,434

Prices for crude oil in Utah are below national averages, while natural gas is typically higher (see Table 30). Overall, Utah had the 10th lowest average electricity prices in the nation in 2014 (the most recent data available).

Table 30: Energy Cost Comparison

Energy Type	Utah Cost	U.S. Average Cost
Domestic Crude Oil	$36.70/barrel	$42.30/barrel
Natural Gas (City Gate)	$5.49/1,000 cu.ft.	$4.00/1,000 cu.ft.
Coal	$35.50/short ton	$37.25/short ton
Electricity - Residential	10.58 cents/kWh	12.73 cents/kWh

Utah has seven operating mines that produce coal from roughly 71 leases, covering approximately 83,000 acres, according to the Department of Energy. Current projections suggest that the existing mines have roughly 15 years of reserves at the present rate of production (and using the existing methods of mining), while additional leasing could extend the life of Central Utah coal fields by 40 to 50 years, depending on coal prices. As of 2015, Carbon County had four of the state's seven coal mines, while Emery County had two coal mines.



Notable, however, is that new coal leases are presently prohibited, with the United States government placing a moratorium on such activity until the coal leasing program is better analyzed. Consequently, companies wishing to expand are presently

[9] Source: Utah Geological Survey

required to postpone any plans of growth.

Utah energy consumption includes primarily coal and natural gas, with state projections anticipating a greater future reliance on natural gas. State leaders project a stronger reliance on renewables by 2050, with 20 to 35 percent of all usage coming from solar, wind, and biomass means (Envision Utah 2050).

Utah holds roughly 1.5 percent of the crude oil reserves for the United States (approximately 555 million barrels), while its crude oil production tripled from 2004 to 2014. Natural gas production in the State accounts for nearly 2% of U.S. output, with three of the largest 100 U.S. natural gas fields, ranked by proved reserves, found in Utah. The State consumes about half of the natural gas it produces, and generates more electricity than it consumes. Consequently, Utah is a net power supplier to other states. The largest power generating system in Utah was built for California use, and is anticipated to be fully converted to all natural gas production due to stringent California laws.

The local labor force (in Carbon and Emery Counties) has felt the impacts of weakness in the global and national mining markets. Roughly 150 mining jobs have been lost in Emery County in the past three years, while approximately 160 mining jobs have been lost in Carbon County since 2012.

Average monthly wages for mining jobs in Emery County have declined 24 percent in the past three years, as jobs at all levels have been lost due to closures and an inability to expand and continue operations (based on federal regulations in place at present). Conversely, average monthly wages for mining jobs in Carbon County have increased 31 percent since 2012. The exact reasoning for this is unknown; however, some speculate that it may be due to only lower level jobs having been lost, while management and executive positions have been maintained.

While not directly connected with Emery and Carbon Counties, the impact of Kennecott (Rio Tinto) is notable for the area. The large-scale miner intends for additional, significant layoffs in Utah in 2016 due to low copper prices and unfavorable mining conditions. It also anticipates that copper needs may not escalate until mid-2017. In early March 2016, Kennecott laid off 200 workers, resulting in a total of nearly 300 since the end of 2015. More layoffs are planned for 2016's second quarter.

Occupational and Skills Analysis

Several businesses in the two counties were contacted to understand their current and future workforce needs. The businesses contacted include the following:

- Castleview Hospital
- Utah State University – Eastern
- Nielson Construction
- Canyon Fuels Company
- Intermountain Electronics
- Joy Technologies
- Pinnacle Canyon Academy
- Savage Industries
- Sorenson Communications
- West Ridge Resources
- Castle Valley Mining
- Emery County School District
- Energy West Mining Company
- PacifiCorp
- SOS Staffing Services
- Tram Electric
- Union Pacific Railroad
- Utah Railway Company
- W. W. Clyde
- Emery Telcom
- Bodec, Inc.
- Carbon County School District
- Conoco Phillips Company
- Electrical Contractors, Inc.
- Jacobsen Contractors
- Longwall West
- Love Less Ash Company
- Swanson Industries
- Nelco Contractors
- Renegade Industrial
- Utah American Energy
- Industrial Electric
- Conductive Composites
- XTO Energy

Findings from these interviews are grouped into four categories:

- Missing Skills in the Workforce
- Available Workforce Training
- Current and Future Employment Needs, and
- Opportunities for Job Growth.

Missing Skills in the Workforce

Employers indicated that, on average, only 45 percent of applicants from the local area have the skills, training, certificates, or degrees required for the position for which they are applying. Many of the businesses indicated the applicants and employees lack soft skills, including communication (both written and verbal), initiative, and self-reliance. While some of the skills lacking, like a strong work ethic, cannot be taught in a classroom or other work setting, other skills can. Some of the skills lacking include:

"Although we have ultimately been successful, it has been difficult to hire locally because many of the applicants lack essential soft skills, primarily written and verbal communication skills."

- Communication (written and verbal)
- Computer and technology
- Technical programs (e.g., welding, machine shop, electrical, etc.)
- Management

Available Workforce Training

Because many applicants lack some of the skills required for their position, most of the businesses indicated that because they are in demand for workers, they conduct on-the-job training to train new employees the skills required for their position. Furthermore, several businesses indicated that they work in conjunction with USU Eastern to provide training, certification, and continued education for their employees. However, when asked about the Center for Workforce Development, most of the businesses indicated that they either did not know the role and purpose of the Center, or that they knew about the Center but did not have a working relationship with the Center. This may be a result of several factors:

- Businesses associate training courses with USU Eastern and not the Center for Workforce Development; and
- The individuals interviewed were not familiar with the Center, but that may not be reflective of the entire business and others more directly associated with the training programs.

Current and Future Employment Needs

Businesses in the area have a variety of current and future employment needs. Some of these needs are outlined below:

Table 31: Current Employment Needs and Requirements

Industry	Employment Needs	Required skills, training, degrees, or certifications
Education	Building Maintenance	No degree, license, or certification required (unless working with asbestos), specialized skills and experience in HVAC, electrical, plumbing, building construction, or auto maintenance preferred
Education	CTE Instructor	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Custodian	None
Education	School Administrator	Utah School Administrator/Supervisor License, Master's Degree in School Administration
Education	Special Education Teacher	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Speech and Hearing Teacher	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Teachers(Art, Geography, Math, Music, Science)	Bachelor's Degree, Teaching License, subject-specific endorsement
Education	Teaching Assistant	Associates Degree, ParaPro Assessment Test
Healthcare	Nurse	Degree in Nursing and licensure
IT	Programmer	Technical training
IT	Web Designer	Technical training
IT	Database Engineer	Technical training
Oil, Gas & Mining/Manufacturing	Apprentice Electrician	None, electrical training preferred
Oil, Gas & Mining/Manufacturing	Electrical Engineer	Degree in Electrical Engineering
Oil, Gas & Mining/Manufacturing	Journeyman Electrician	Electrician Certification
Manufacturing	Chemical Engineer	Degree in Chemical Engineering
Professional, Scientific, &	Communications Assistant (entry-level position)	Type 30 WPM, pass entry-level dictation exam

Industry	Employment Needs	Required skills, training, degrees, or certifications
Technical Services		
Utilities/Energy	Power Plant Manager	Management experience
Utilities/Energy	Utility Workers	None

Electrical
Mining companies, mining-support companies, and manufacturers indicated a need for electricians, both apprentice and journeymen, and electrical engineers. Due to the training nature of electrician apprentices, there typically needs to be one journeyman electrician for each apprentice. Apprentices don't require any previous training, though it is preferred, and journeymen must have an electrician certification. Electrical engineers must have a degree in electrical engineering.

Information Technology
Positions needed within information technology range from communications assistants (call center agents), to inside sales and programmers. Call center agents must be 18 years old and must have specific communications and computer skills. Programmers primarily need experience with JavaScript.

Education
Schools in Carbon and Emery are in need of teacher's assistants, teachers, and administrators, each of which requires a degree and licensure. Specific areas of need include elementary education, art, geography, math, music, science, special education, and speech and hearing. The school districts also have need of custodians and other building maintenance personnel. While no degree, license, or certification is required for these positions (unless working with asbestos), specialized skills and experience in HVAC, electrical, plumbing, building construction, and auto maintenance are preferred.

Other Entry-level Technical Positions
Many businesses, including manufacturers and mining support industries, indicated a constant need for entry level positions. Though having experience in technical areas, including welders and machinists, is preferred, many of the skills can be taught on the job.

Opportunities for Job Growth

As noted previously, Carbon and Emery historically have relied heavily on the coal mining industry for employment. This emphasis on coal mining has adversely affected this area as mines have closed and a moratorium has been placed on renewing coal leases, resulting in significant decreases in employment. One business interviewed indicated that, "We are not seeing the same demands as years past for heavy construction or mining equipment needs in southeastern Utah. The political climate is not advantageous, but the potential is still quite exciting." Furthermore, a population that is not only declining, but also aging, has contributed to a lack of qualified employees for local businesses. Creating a diversification of industries will provide a variety of employment opportunities for residents, which will better sustain fluctuating market conditions.

"We are not seeing the same demands as years past for heavy construction or mining equipment needs in southeastern Utah. The political climate is not advantageous, but the potential is still quite exciting."

There are several opportunities for job growth in a variety of industries that could be pursued in Carbon and Emery counties. These industries include:

- Other Mining
- Information Technology
- Manufacturing/Re-manufacturing
- Supply Chain Management, Logistics, and Delivery Systems
- Warehousing and Distribution
- Energy
- Education
- Healthcare
- Tourism and Other Non-basic industries

Other Mining

Carbon and Emery counties are known for their coal, natural gas, and oil mines; however, two other potentially high-value commodities exist at unique levels within the study area: helium and carbon dioxide. Each of these resources has been identified to be commercially relevant and potentially financially feasible to extract.

Carbon dioxide in Carbon County has been a known resource in the area since drilling for oil began around 1900. The carbon dioxide exists primarily in the Navajo Sandstone layer but is also found in other layers within the two-county region. Two man-made, $C0_2$ influenced geysers have been created by drilling activities. One is Crystal Geyser south of Green River, and the other is at Woodside, near the Price River. The reserves at Farnham Dome, as well as another known reserve near Gordon Creek in Carbon County, are approximately 99% $C0_2$. Other reserves in the two-county area are lower in purity with the balance consisting of helium and nitrogen. Helium is a valuable resource, but nitrogen can be difficult to separate. These additional reserves are located near Sunnyside, Woodside and Green River.

Commercial development of the $C0_2$ resource began in the early 1930s at Farnham dome, 3 miles east of Wellington. This resource operated a dry ice facility that ran until about 1980. After the closure of the facility, the resource was unused until the wells were re-opened in the early 2000s and a $C0_2$ plant was built near Highway 6, west of East Carbon. This facility produces high-grade $C0_2$ for the food industry as well as commercial $C0_2$ for industrial uses. The operators of the field believe there is in excess of 1 trillion cubic feet of recoverable $C0_2$ reserves in the deposit near Farnham Dome. The existing $C0_2$ facility is located adjacent to rail service and US Highway 6. A pipeline to haul CO_2 has been proposed between Wellington and the Uintah Basin to use for drilling and well stimulation projects for crude oil and natural gas.

Helium is another unique resource in the area with significant commercial potential. Two companies are currently in various stages of development of helium wells and one has drilled a successful well in Emery County. The helium resource is a world class reserve, with helium concentrations significantly higher than most underground sources. The federal government identified the resource in the early 20th century and reserved the majority of the reserves as a part of the National Helium Reserve for military purposes. As this program is phased out, the federal government still maintains control of much of the reserve and leases for the product have to be negotiated with the BLM. As Helium becomes more scarce, commercial opportunities will continue to develop. The resource in Carbon and Emery counties will be very attractive because of the shallow depth to formation as well as the high concentrations of supply.

If the helium and CO_2 mining industries continue to develop in the area, many jobs could be created in the short- and long-term. Short-term, approximately 50 positions would be needed for the construction and drilling of the facilities. Once construction has completed, approximately 12 jobs per facility would be needed for operations, most of which would be low-skilled positions (e.g., labor, technician, transportation), with 3 to 4 high-skill positions in engineering and management.

Another mining-related industry that could have potential in Carbon and Emery counties is coal conversion to clean diesel natural gas. Coal mined in Carbon and Emery counties is cleaner than many other coals, and therefore can be converted to other forms of energy. Though having sufficient water to run the facility may be an issue, local officials are optimistic that this industry will soon come to the area and create 200 jobs to complete the construction of the facility over a few years, with approximately 60 jobs once construction is completed. While many of these positions will be entry-level, there will be a significant need for chemical engineers.

Information Technology

Businesses indicate a need for more tech jobs in the local area. The Gardner Policy Institute at the University of Utah forecast a total of 6,000 new tech jobs statewide by 2025. Due to the technical nature of these positions, they will go to areas with a skilled labor force. Furthermore, the Institute estimates there are roughly 3,500 tech job openings at present, most of which are being filled in Utah County.

Accelerant is a business based in Salt Lake City which creates local jobs and partners with various businesses to train rural residents for the specific skill sets that urban employers need in technology, information, sales, marketing, and professional service sectors. Accelerant provides IT support positions for several local and national businesses, including Walmart, Dowdle Folk Art, and Tatt2Away. Accelerant focuses on training and placing individuals within one of four tiers:

Tier 1: Sales, Administrative Support, Customer Service
Tier 2: Creative and Design
Tier 3: Programming, Developer Ops, Data Science
Tier 4: Strategy, Administration, Management

During initial rollout, Accelerant anticipates a need for 50 inside sales jobs, with that number increasing to approximately 100 within the next year. Within 6 months of operations beginning in Price, Accelerant anticipates the need for 50 IT jobs, with that number also increasing over time. Accelerant estimates there are currently 300 people in Carbon County that are predisposed to IT jobs, but that there is a significant lack of jobs for these individuals. To train these individuals, Accelerant plans to work with USU Eastern to provide a 12-14 week boot camp training to train individuals in the required IT skills, primarily Java Script (including Node and Angular).

Manufacturing/Re-manufacturing

There are several manufacturing opportunities that could be pursued in Carbon and Emery counties. Composites are a growing industry in Utah and some businesses have already located in the study area. Conductive Composites, for example, is a company that creates composites coated in nickel which makes the material electrically conductive. In 2015, Carbon Composites relocated their Green River facility to Cleveland in Emery County. The facility includes two manufacturing lines, though only one is operating at this time. Conductive Composites anticipates the second line will be operational within the next few weeks, at which point both lines will be operationally 24 hours per day, 6 days per week. The increase in production will require an

additional five employees (a mixture of line operators, quality assurance, and maintenance). The facility currently employees 10 individuals (6 line operators, 1 maintenance technician, 1 quality assurance technician, 1 chemical engineer, and 1 plant manager), The facility consumes large amounts of industrial gasses, some of which thy produce while others they purchase from providers. There are opportunities for support businesses, including industrial gas providers, to relocate near the Conductive Composites facility. The relocation of support businesses would be beneficial as they also serve the mining and energy industries in the area.

The success of Conductive Composites in Emery County indicates the potential for other manufacturers to locate to the area. Other manufacturing opportunities include plastics and food manufacturing. While many businesses in the State of Utah use plastic pellets in their manufacturing processes, the State lacks a plastic pellets manufacturer. The addition of this industry would create many low- and high-skilled jobs, including chemical engineers, quality control, and management.

Supply Chain Management, Logistics, and Delivery Systems

Mining related businesses in the area have expressed concerns about changing needs in the industry and how product is delivered to market. Some employers and consultants indicate that upgrades need to be made in terms of product management, logistics, and supply change management. Furthermore, they indicate that some of southeastern Utah lacks a skilled workforce that adapts to changes in market influences. One business indicated, "We have certainly witnessed a shift in recent years for mining transportation needs (in south eastern Utah). There is an absence of technology and transit means to bring product to market in a quicker, more efficient way. Regulations are such that it is becoming less cost effective to ship coal outside of the state."

Several companies report a need for more stream-lined transportation means to bring products to market. Supply chain management and product delivery are key in an evolving and cyclical mining industry. To address these concerns, transportation engineers and supply chain managers are in need in southeastern Utah, according to several sources. New systems for delivery, as well as more efficient rail use and connections to suppliers, are requisite.

"We have certainly witnessed a shift in recent years for mining transportation needs (in southeastern Utah). There is an absence of technology and transit means to bring product to market in a quicker, more efficient way. Regulations are such that it is becoming less cost effective to ship coal out of state."

Warehousing and Distribution

Improvements to infrastructure and supply chain management could also provide opportunities for warehousing and distribution centers. Green River is a potential site for warehousing and distribution centers due to its location along I-70 and railroad access, as well as an abundance of vacant land. Price could also serve as a warehousing and distribution site. Improvements to Highway 6 have improved the access to Price; however, the railroad infrastructure in Price would need some upgrades, but repurposing the current infrastructure would cost less than having to build a new railroad infrastructure.

Energy
The Bluecastle Project is a proposed 3,000 MW nuclear generating facility to be located at Green River, in Emery County. The project has selected a site, secured water, initiated the Nuclear Regulatory Agency permitting process, initiated required environmental and economic studies and is working though issues such as transmission and long term purchase agreements for power. There is a minimum of 4 years remaining on the permitting process, so construction is not expected to begin until at least 2020.

During construction, peak employees on site could exceed 1,500. Typically, there will be a crew of 300 to 500 during the life of the construction, which is anticipated to last approximately 7 years.

The management team of Bluecastle is proposing a facility that will permanently employ between 700 and 900 employees upon completion of the facility, including support, contract and other personnel. Because of the unique nature of the positions, anticipated wages for the facility will be significantly above the county average wage. Nuclear Engineers, Electrical Engineers, and management employees will all have starting wages likely above $90,000 per year and many will be significantly above this. Based on other operating facilities, this top tier will include approximately 100 employees.

The next tier of key personnel is related to security and safety. This group will be between 150 and 200 employees and wages will be in the $70,000 to $100,000 range. Many of these employees will come from retired military and other government experience pools.

Control room operators and other "traditional" power plant staff wages will be driven by the job market. Currently, these positions start around $50,000 per year and top out around $90,000. Approximately 200 employees will fall into this group.

Basic maintenance, service, janitorial, accounting and other business services will include both employees and contractors. It will include 200 or more employees that will make between $40,000 and $60,000 per year.

It is anticipated that the employees will live, not just in Green River, but in the communities throughout the region. The communities of Price, Wellington, East Carbon, Ferron, Emery and Moab are all expected to have significant numbers of employees.

Education
Traditional teaching paths have experienced declining enrollment statewide, a trend that started in 2011. Despite having higher wages, rural communities are expected to have more teacher shortages for the next several years,[10] as many rural school districts find it difficult to attract teachers from the Wasatch Front to fill positions, or retain graduates from USU Eastern. The most significant educational needs are for elementary education, as well as fields of art, geography, mathematics, music, science, special education, and speech and hearing.

Table 32: Average Teacher Salary Comparison (Source: CACTUS (Educator Licensing) Database)

	Carbon	Emery	State
Average Teacher Salary	$45,736	$48,902	$46,689
Average Teacher Salary with Benefits	$80,580	$85,489	$76,664

[10] U.S. Office of Education

Furthermore, there is also a substantial issue in teacher retention. A 2015 report by the U.S. Department of Education reported that of teachers that began teaching in 2007-2008, 12 percent did not teach in 2008-2009, 12 percent did not teach in 2009-2010, 15 percent did not teach in 2010-2011, and 17 percent did not teach in 2011-2012.[11]

Healthcare

Many individuals have indicated that the lack of diversity in the available providers in Carbon and Emery counties, coupled with a gap between the available providers and the providers which are covered by insurance providers, causes some individuals to seek healthcare outside of the area. This leakage indicates the potential for additional healthcare jobs in the area. However, plans for a new Intermountain Healthcare hospital in Spanish Fork may diminish, but not completely meet, the need for healthcare jobs in Carbon and Emery counties. The current demand for healthcare positions in the area include certified nursing assistants, licensed practical nurses (though the industry is moving away from this position), nurses, and medical technologists.

Tourism and Other Non-basic Industries

While there is potential for non-basic industries, including tourism, service-related, and retail businesses, in the area, these businesses will likely grow as the basic industries grow.

[11] Source: U.S. Department of Education

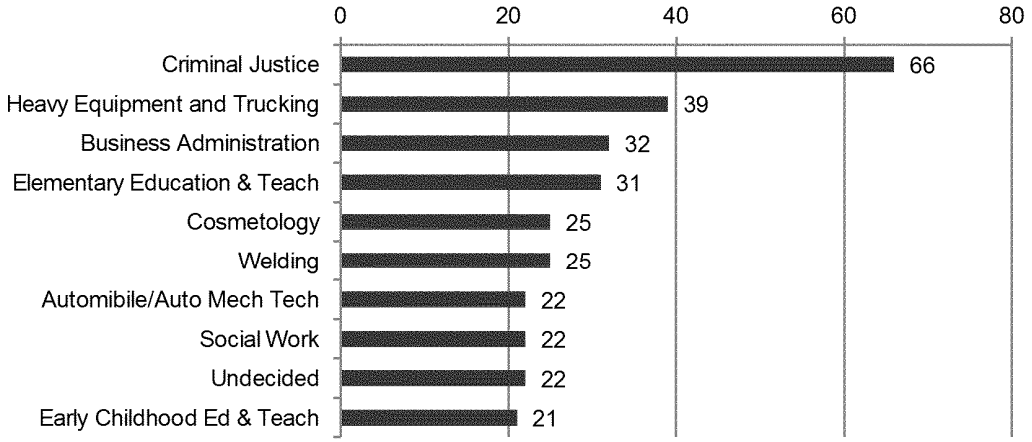
Educational and Skills Trends

There are multiple avenues for individuals to receive skills training in Carbon and Emery counties, including USU Eastern, the Center for Workforce Development, as well as through CTE programs through the local school districts and charter schools.

USU Eastern

For the 2015-2016 academic year, there are more than 1,600 students enrolled in various programs. Figure 7 shows the programs with the most enrollees between 2012 and 2015.[12] The programs with the most enrollees during this period include Criminal Justice, Heavy Equipment and Trucking, Business Administration, and Education.

Figure 7: USU Eastern - Total Program Enrollment (2015-2016)



Figures 8 and 9 show how enrollment has changed over the last 3 years, with Figure 8 displaying programs that have experienced an increase in enrollment and Figure 9 showing programs that have had a decrease in enrollment. Programs with an increase in enrollment include Education, Business Administration, and Criminal Justice, while Cosmetology, Nursing, Liberal Arts and Science, and Welding have decreased the most.[13]

[12] Only includes enrollees that have declared a major; therefore, it does not include enrollees listed under general studies, undeclared, non-degree seeking enrollees, or pre-programs. Students that are taking courses toward a major but have not declared a specific major are not included.

[13] Does not include general studies, undeclared, or non-degree seeking enrollees

Figure 8: Enrollment Increase (2012-2015)

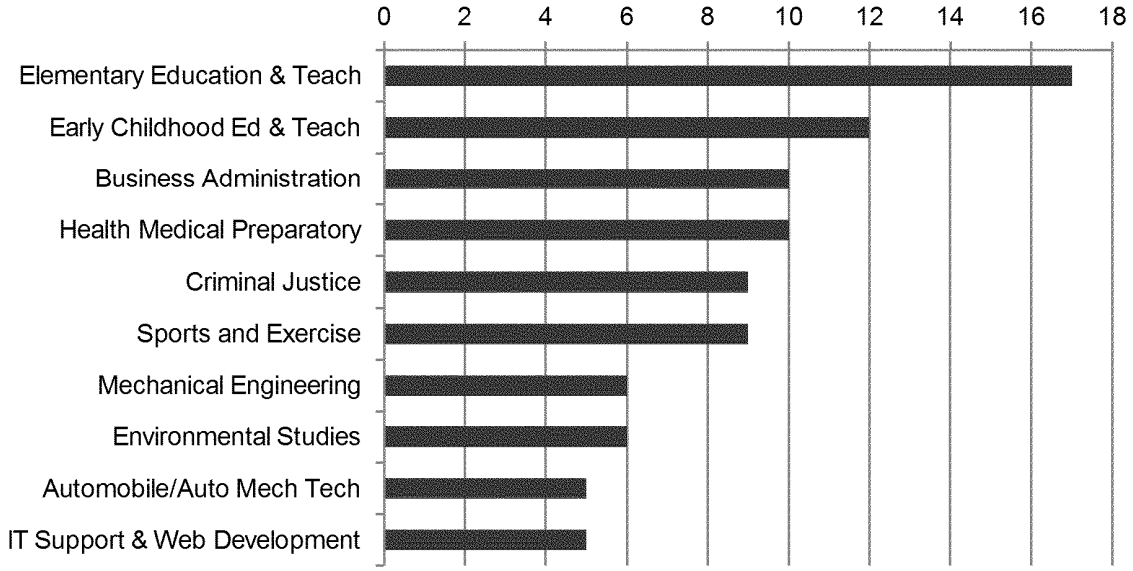


Figure 9: Enrollment Decrease (2012-2015)

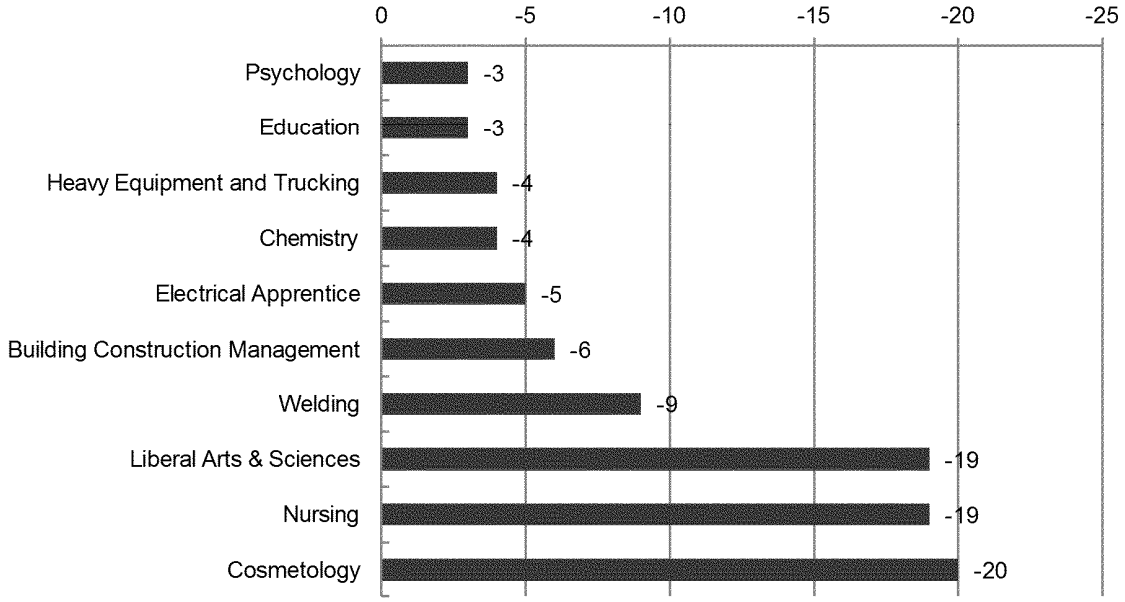


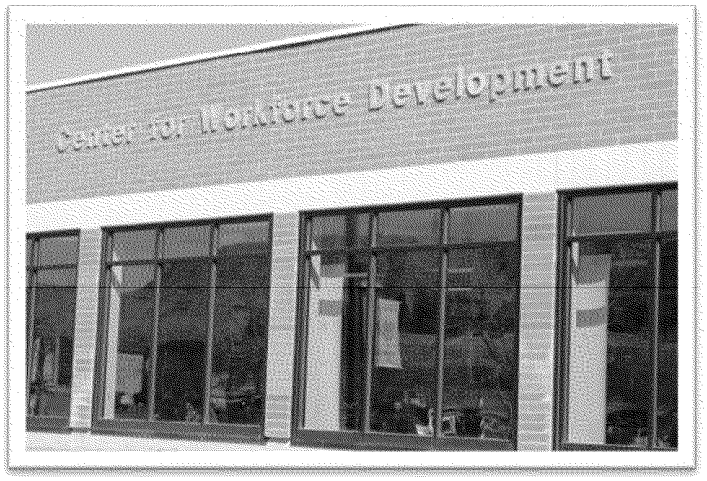
Table 33 aggregates programs based on their industry. Many of the programs for which there is an employment need in the local industry have experienced a decrease in enrollees since 2012. Education, on the other hand, has a large significant number of enrollees and has had enrollment growth since 2012. A complete list of these industries and the programs included in each industry is included in the Appendix.

Table 33: Enrollment of Industry Needs

Industry	Total Enrollees (2015-2016)	Change (2012-2015)
Construction	0	-6
Education	55	26
Electrical	4	-9
Engineering	17	7
Heavy Equipment and Trucking	60	6
IT	17	2
Machinist	5	-1
Medical	52	-2
Mining	0	0
Welding	25	-9
Grand Total	235	14

Center for Workforce Development

The Center for Workforce Development (CWD) offers a variety of courses and programs to prepare students to be successful in various careers. The intentions of students vary, including high school students obtaining CTE credit, high school graduates seeking training for a specific skill or trade, working professionals looking to upgrade their skills and enhance job security, partnerships and businesses to train employees, and individuals taking courses out of personal interest.



From 2013 to 2015, the CWD has had between 220 and 265 high school students enrolled in courses. The programs that have the greatest number of students have been Automobile (79 to 161 students), Computer Programming (45 to 74 students), and Welding (28 to 41 students).

Table 34: Center for Workforce Development High School Student Enrollment (2013-2015)

Program	2013-2014	2014-2015	2015-2016 (To Date)
Accounting	0	0	0
Automobile	161	79	88
Building Construction	16	10	6
Business Admin Support	0	0	0
Certified Nursing Assistant	2	0	0
Computer Applications	0	0	0
Computer Programming	45	74	73

Program	2013-2014	2014-2015	2015-2016 (To Date)
Drafting	0	29	9
Electrical Recertification	0	0	0
EMT	0	0	0
First Aid/CPR	0	0	0
New Miner Training	0	0	0
Mining Annual Refresher	0	0	0
MSHA Trainer	0	0	0
Welding	41	28	14
Total	265	220	190

There is a greater variety in the courses that adult students take at the CWD compared to high school students. Major programs based on the number of adult enrollees include Business Admin Support (47 to 92 students) and Computer Applications (22 to 54 students).

Furthermore, many adult students of the CWD are enrolled for training required by the Mine Safety and Health Administration (MSHA). In 2014, 239 adults, or 55 percent of all adult students, were enrolled in MSHA trainings offered by the CWD. Additionally, 48 students in 2014 were enrolled in the Electrical Recertification program.

Table 35: Center for Workforce Development Adult Enrollment (2013-2015)

Program	2013-2014	2014-2015	2015-2016 (To Date)
Accounting	2	0	1
Automobile	10	0	0
Building Construction	0	0	0
Business Admin Support	92	47	56
Certified Nursing Assistant	18	25	0
Computer Applications	54	22	4
Computer Programming	0	0	0
Drafting	0	0	0
Electrical Recertification	43	48	67
EMT	3	0	2
First Aid/CPR	73	54	0
MSHA New Miner Training	119	54	44
MSHA Mining Annual Refresher	195	174	94
MSHA Trainer	4	11	13
Welding	0	0	0
Total	613	435	281

The total enrollment by program is shown in Table 36. In 2014, 36 percent of all students were enrolled in mining training courses, 12 percent in Automobile, and 11 percent in Computer Programming.

Table 36: Center for Workforce Development Total Enrollment (2013-2015)

Program	2013-2014	2014-2015	2015-2016 (To Date)
Accounting	2	0	1
Automobile	171	79	88
Building Construction	16	10	6
Business Admin Support	92	47	56
Certified Nursing Assistant	20	25	0
Computer Applications	54	22	4
Computer Programming	45	74	73
Drafting	0	29	9
Electrical Recertification	43	48	67
EMT	3	0	2
First Aid/CPR	73	54	0
New Miner Training	119	54	44
Mining Annual Refresher	195	174	94
MSHA Trainer	0	0	13
Welding	41	28	14
Total	878	644	471

Because the intentions of students varies, with not all looking to complete certification in a field, Table 37 shows the number of students that received certifications in various programs and the certification rate of all students in each program. In 2014, 70 percent of certifications completed through the CWD were mining related, with another 14 percent for Electrical recertification.

Table 37: Center for Workforce Development Total Certifications (2014-2015)

Certification	Total Certifications 2014-2015	Percent of Certifications 2014-2015	Total Students 2014-2015	Certification Rate 2014-2015
American Red Cross First Aid/CPR	25	7%	54	46%
ASE Automotive Technician	0	0%	79	0%
Certified Nursing Assistant	24	7%	25	96%
Customer Service Specialist	0	0%	47	0%
Electrical Recertification	48	14%	48	100%
EMT	0	0%	0	NA
Microsoft Office Certification	6	2%	22	27%
MSHA New Miner Certification	54	16%	54	100%
MSHA Miner Annual Refresher Certification	174	51%	174	100%
MSHA Trainer Certification	11	3%	11	100%

Certification	Total Certifications 2014-2015	Percent of Certifications 2014-2015	Total Students 2014-2015	Certification Rate 2014-2015
Total	342	100%	514	67%

Carbon and Emery School Districts

In addition to partnering with the USU Eastern and the Center for Workforce development to provide CTE credits and training, Carbon and Emery School Districts provide additional CTE courses to provide skills training for students. As noted in the CWD enrollment statistics, students from Carbon and Emery School Districts who are enrolled in CDW courses are included in the CWD numbers.

Carbon School District

Enrollment in CTE and concurrent enrollment programs in Carbon School District increased from 2014 to 2015, without major changes in the percent of students enrolled in each program. In 2015, 23 percent of course enrollments were in technology courses (e.g., Information Technology, Exploring Technology), and 16 percent were other skilled trades (e.g., Carpentry, Construction, Engineering, Transportation and Energy, Natural Resource Sciences, Welding, and Woodwork). Overall, 830 students are enrolled in CTE courses, with a cumulative enrollment for all CTE courses of 2,217, students enrolled in CTE courses were, on average, enrolled in 2.67 CTE courses.

Table 38: Carbon School District CTE Enrollment (2014-2016)

Pathway	2014-2015	2015-2016	% of Students 2014	% of Students 2015	Change
Accounting	122	98	6%	4%	-1%
Agricultural Communication	0	10	0%	0%	0%
Animal Science	59	69	3%	3%	0%
Architectural Design 2	9	0	0%	0%	0%
Automotive	34	17	2%	1%	-1%
Barbering	36	0	2%	0%	-2%
Business	51	60	2%	3%	0%
Career Orientation & Exploration	88	0	4%	0%	-4%
Carpentry 1	18	0	1%	0%	-1%
Child Development	86	96	4%	4%	0%
Clothing and Textile 1	161	22	7%	1%	-6%
Construction Trades Foundation	22	0	1%	0%	-1%
Cosmetology	36	0	2%	0%	-2%
CTE Internships	32	74	1%	3%	2%
Economics	43	23	2%	1%	-1%
Engineering Design	29	27	1%	1%	0%
Entrepreneurship - Marketing	23	72	1%	3%	2%
Equine Science - Year	0	17	0%	1%	1%

Pathway	2014-2015	2015-2016	% of Students 2014	% of Students 2015	Change
Exercise Science / Sports Medicine	34	23	2%	1%	-1%
Exploring Technology	1	0	0%	0%	0%
FACS Exploration	1	0	0%	0%	0%
Floriculture	42	103	2%	5%	3%
Food and Nutrition	229	215	10%	10%	-1%
Health Science	47	0	2%	0%	-2%
Information Technology	402	515	18%	23%	5%
Interior Design	52	126	2%	6%	3%
Introduction to Construction Technology	26	0	1%	0%	-1%
Introduction to Transportation & Energy	1	0	0%	0%	0%
Law Enforcement	10	0	0%	0%	0%
Leadership Management Principles	0	13	0%	1%	1%
Marketing	124	193	6%	9%	3%
Natural Resource Science 1	58	76	3%	3%	1%
Network+	5	0	0%	0%	0%
Pre-engineering	19	20	1%	1%	0%
ProStart I	18	19	1%	1%	0%
Screen Printing Technology	63	54	3%	2%	0%
Technical Design 1	36	23	2%	1%	-1%
Television Broadcasting 2	31	26	1%	1%	0%
Welding Technician - Entry Level	32	25	1%	1%	0%
Woodworking	113	201	5%	9%	4%
Grand Total	2,193	2,217	100%	100%	1%

Emery School District

Although CTE enrollment in Emery County decreased between 2014 and 2015, the decreases seem to have been across the board, with very little change in percent of CTE students in each program. Courses related to technology (e.g., Computer Technology, Desktop Publishing, Digital Business Applications, and Exploring Technology) comprised 19 percent of all enrollees in 2015, and 22 percent were in other skilled trades (e.g., Cabinet Making and Millwork, Carpentry, Construction, Manufacturing, Transportation and Energy, Machining, Manufacturing, and Welding).

Emery School District reported that in 2016, 16 students found employment after high school as welders or machinists, but that in 2015 only 5 students were placed into jobs after graduation (in various industries). Furthermore, the District indicated that every year they have numerous students that participate in internship programs, primarily in the healthcare, veterinarian, and education industries.

Several changes have occurred to the CTE program at Emery School District, including one pathway (Materials & Manufacturing) which was cancelled due to the lack of qualified staff to teach the course, and the Automotive pathway which has recently been taught by an adjunct instructor. A new full-time instructor will be hired next year to teach the Automotive and Science, Technology, Engineering, and Math (STEM) classes. The District began Law Enforcement courses this year, at the request of the local Sherriff's department, and is working with USU Eastern to begin a Mechanics and Repairs pathway next year.

Table 39: Emery School District CTE Enrollment (2014-2016)

Pathway	2014-2015	2015-2016	% of Students 2014	% of Students 2015	Change
Accounting	22	26	1%	2%	1%
Adult Roles and Responsibilities	13	6	1%	0%	0%
Agricultural Communication	9	9	1%	1%	0%
Animal Science	138	108	9%	9%	0%
Architectural Design	39	17	3%	1%	-1%
Automotive	123	46	8%	4%	-4%
Business Communication	12	4	1%	0%	0%
Cabinet Making and Millwork	25	17	2%	1%	0%
Carpentry	16	13	1%	1%	0%
Child Development	23	22	1%	2%	0%
Clothing and Textile	56	70	4%	6%	2%
Computer Technology	178	134	11%	11%	-1%
Desktop Publishing	59	32	4%	3%	-1%
Digital Business Applications	8	15	1%	1%	1%
Entrepreneurship	28	10	2%	1%	-1%
Exploring Technology	63	50	4%	4%	0%
Floriculture	59	31	4%	3%	-1%
Food and Nutrition	155	125	10%	10%	0%
Interior Design	23	25	1%	2%	1%
Introduction to Construction Technology	42	23	3%	2%	-1%
Introduction to Manufacturing Technology	79	78	5%	6%	1%
Introduction to Transportation & Energy	57	45	4%	4%	0%
Keyboarding	91	109	6%	9%	3%
Law Enforcement	0	7	0%	1%	1%
Leadership Management Principles	10	-	1%	0%	-1%
Machining	20	12	1%	1%	0%
Materials & Manufacturing Processes	13	-	1%	0%	-1%

Pathway	2014-2015	2015-2016	% of Students 2014	% of Students 2015	Change
Technical Design	22	46	1%	4%	2%
Welding Technical Entry Level	43	34	3%	3%	0%
Welding Technology Advanced	58	45	4%	4%	0%
Workplace Skills	76	72	5%	6%	1%
Grand Total	1560	1,231	100%	100%	0%

Pinnacle Academy

Pinnacle Academy, a private school in Price, allows high school students to enroll in any course offered at USU Eastern or the Center for Workforce Development; therefore, students enrolled in programs through USU Eastern or the CWD are included in their enrollment numbers.

Employment Needs and Available Workforce Gap

In 2015, there were 1,889 jobs postings in Carbon and Emery counties on the Department of Workforce Services website. Of the total postings, 1,690, or 89 percent, were in Carbon County. Table 40 shows a list of all the postings by industry.[14]

Table 40: 2015 Job Postings by Industry (Source: Department of Workforce Services)

Industry	Carbon	Emery	Total
Administration and Support, Waste Management and Remedial Services	434	10	444
Retail Trade	209	37	246
Health Care and Social Assistance	210	20	230
Public Administration	164	22	186
Educational Service	120	1	121
Accommodation and Food Services	104	13	117
Transportation and Warehouse	93	13	106
Construction	51	18	69
Finances and Insurance	50	12	62
Other	38	13	51
Wholesale Trade	37	6	43
Agriculture, Forestry, Fishing and Hunting	30	9	39
Professional, Scientific and Technical Services	30	8	38
Mining	34	0	34
Other Services	28	3	31
Manufacturing	23	2	25
Real Estate, Rental and Leasing	21	0	21
Utilities	6	11	17
Information	5	1	6
Management of Companies and Enterprises	3	0	3
Total	1,690	199	1,889

Based on job titles, in 2015 there was a significant need for positions within key industries for the area. For example, there were 65 electrical-related positions in 2015, 132 construction-related positions, and 169 truck driver positions. Notably, there were only 17 IT positions posted in 2015. Despite few open positions, industry growth indicates great potential for this industry in this area.

[14] Industries are based on NAICS codes. Because businesses self-identify their NAICS code, there may by discrepancies among the industries. Furthermore, this includes all postings and does not account for multiple postings for the same position. Based on the current structure, DWS does not have the means to account for duplicate postings as businesses can repost for the same position each month.

Table 41: 2015 Job Postings by Title (Source: Department of Workforce Services)

Job Title	Carbon	Emery	Total
Education	84	3	87
Teacher	58	2	60
Education Administrator	4	1	5
Counselors	12	0	12
Teacher Assistant	10	0	10
Electrical	65	0	65
Electrician	46	0	46
Electrical Engineer	6	0	6
Other Electrical (Repair, Assemble)	13	0	13
Engineers	17	0	17
Operating Engineers	13	0	13
Civil Engineer	1	0	1
Health and Safety Engineer	1	0	1
Drafting	2	0	2
Welding	31	1	32
Construction	106	26	132
Construction Laborers	90	22	112
Construction Managers	1	0	1
Front-Line Supervisors	4	4	8
Painters, Construction, Maintenance	11	0	11
Truck Drivers	144	25	169
Heavy	128	21	149
Light	16	4	20
Industrial	14	0	14
Mechanics	18	0	18
Automotive Service Mechanics	8	0	8
Bus and Truck Mechanics	10	0	10
IT	15	2	17
Computer Support Specialists	6	1	7
Computer User Support Specialists	5	0	5
Network and Computer Systems Administrators	4	1	5
Machinist	3	0	3
Nursing	21	1	22
Registered Nurse	16	1	17
Licensed Practical Nurse	5	0	5

Table 42 compares the workforce needs (jobs posted in 2015) with the number of students enrolled in various programs (ATC and CTE) to determine what gaps, if any, exist.[15] There is a gap between the number of postings and the workforce that is being trained for most of the positions. However, more welders are being trained than welding positions that are available. Furthermore, many individuals are seeking IT training but there are few jobs to fill the supply. There is a growing workforce of individuals with IT skills that could be used to attract IT businesses to the area.

Table 42: Employment Needs and Available Workforce Gap Comparison

Job Title	2015 Job Postings	USU Eastern Enrollees	CWD Enrollees	Carbon CTE Enrollees	Emery CTE Enrollees	Difference[16]
Teacher	60	55	0	0	0	5
Electrician	46	1	0	0	0	45
Electrical Engineer	6	4	0	0	0	2
Other Engineers	17	17	0	0	0	0
Other Electronics	13	3	0	0	0	10
Welding	32	25	28	25	79	-125
Construction	132	0	10	0	23	99
Heavy Equipment & Trucking	169	60	0	0	0	109
IT	17	17	96	438[17]	50	-584
Machinist	3	5	0	0	12	-14
Nursing	22	9	0	0	0	13

[15] The difference assumes 100 percent retention in Carbon and Emery counties.
[16] Difference = 2015 Job Postings – total enrollees from each institution
[17] There are 438 students enrolled in Information Technology, with accumulative course enrollment of 581; therefore, each Information Technology student enrolled in 1.3 Information Technology courses. Overall, the average CTE student enrolled in 2.67 CTE courses.

Appendices

Appendix A: Utah Demographic Fact Sheet (Source: Kem C. Gardner Policy Institute)
Appendix B: Carbon and Emery County Economic Snapshots (Source: Zions Bank)
Appendix C: Carbon County Economic Profile, 2015 (Source: EDCUtah)
Appendix D: Southeast Utah Local Insights Newsletter – Summer 2015 (Source: Department of Workforce Services)
Appendix E: 2016 Economic Report to the Governor (Source: Utah Economic Council)
Appendix F: GOMB Employment Projections (Source: GOMB)
Appendix G: USU Eastern – Enrollment by Industry (Source: USU Eastern; ZPFI)
Appendix H: Utah College of Applied Technology – Completion Rates (Source: Utah College of Applied Technology)
Appendix I: Accelerant Flyer
Appendix J: Base Metals and Mining Industry Outlook, 2016 (Source: Mining Global)
Appendix K: Mine 2015: The Gloves are Off (Source: PWC)
Appendix L: Utah State Energy Profiles (Source: U.S. Energy Information Administration)

Exhibit B
State of Utah v. EPA, Consolidated Case Nos. 16-9541, 16-9542, 16-9543, 16-9545

Excerpts from EPA's Response to Comments for the Federal Register Notice for Air Quality State Implementation Plans; Approvals and Promulgations: Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze; Partial Approval and Partial Disapproval (Docket No. EPA-R08-OAR-2015-0463) (June 1, 2016)

Response to Comments for the Federal Register Notice for Air Quality State Implementation Plans; Approvals and Promulgations: Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze; Partial Approval and Partial Disapproval

Docket No. EPA-R08-OAR-2015-0463

June 1, 2016

*This Response to Comment Document was finalized on June 1, 2016. As shown in the "redline/strikeout" version of this document in the docket for this action, the Agency made non-substantive and formatting edits on June 9, 2016.

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List of Public Comments

Docket ID Number EPA-R08-OAR-2015-0463-xxxx	Commenter Name/Affiliation
-0031	Citizen Commenter
-0032	Anonymous Commenter
-0033	Anonymous Commenter
-0034	Anonymous Commenter
-0035	Anonymous Commenter
-0036	Anonymous Commenter
-0037	Citizen Commenter
-0038	Anonymous Commenter
-0039	Emery County Public Lands Administrator
-0040	Anonymous Commenter
-0041	Citizen Commenter
-0042	Anonymous Commenter
-0043	Citizen Commenter
-0044	Anonymous Commenter
-0045	Anonymous Commenter
-0046	Anonymous Commenter
-0047	Citizen Commenter
-0048	Citizen Commenter
-0049	Anonymous Commenter
-0050	Anonymous Commenter
-0051	Anonymous Commenter
-0052	Anonymous Commenter
-0053	Citizen Commenter
-0054	Anonymous Commenter
-0055	Citizen Commenter
-0056	Anonymous Commenter
-0057	Anonymous Commenter
-0058	Anonymous Commenter
-0059	Anonymous Commenter
-0060	Citizen Commenter
-0061	Citizen Commenter
-0062	Anonymous Commenter
-0063	Emery County Commissioner
-0064	Citizen Commenter
-0065	Citizen Commenter

-0066	Anonymous Commenter
-0067	Anonymous Commenter
-0068	Citizen Commenter
-0069	Citizen Commenter
-0070	Anonymous Commenter
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-0074	Anonymous Commenter
-0075	Citizen Commenter
-0076	Citizen Commenter
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-0094	Anonymous Commenter
-0095	Anonymous Commenter
-0096	Citizen Commenter
-0097	Citizen Commenter
-0098	Anonymous Commenter
-0099	Anonymous Commenter
-0100	Mass Mailer Sample, National Parks Conservation Association (NPCA)
-0101	Mass Mailer Sample, Sierra Club
-0102	Mass Mailer Sample, Healthy Environment Alliance of Utah (HEAL Utah)
-0103	Anonymous Commenter
-0104	Anonymous Commenter
-0105	Anonymous Commenter

-0106	Anonymous Commenter
-0107	Citizen Commenter
-0108	Anonymous Commenter
-0109	Anonymous Commenter
-0110	Anonymous Commenter
-0111	Anonymous Commenter
-0112	Public Hearing Statements
-0113	Public Hearing Statements
-0114	Sevier Citizens for Clean Air and Water (SCCAW) Hearing Statement
-0115	Anonymous Commenter
-0116	Anonymous Commenter
-0117	Anonymous Commenter
-0118	Early Mass Mailer Sample - Sierra Club
-0119	Anonymous Commenter
-0120	Anonymous Commenter
-0121	Citizen Commenter
-0122	Anonymous Commenter
-0123	Citizen Commenter
-0124	Retired National Park Service Manager
-0125	Anonymous Commenter
-0126	Anonymous Commenter
-0127	Anonymous Commenter
-0128	Citizen Commenter
-0129	Citizen Commenter (repeat of -0121)
-0130	Utah Citizens Advocating Renewable Energy (UCARE)
-0131	Citizen Commenter
-0132	Citizen Commenter
-0133	No document for this number
-0134	Anonymous Commenter
-0135	Anonymous Commenter
-0136	Utah Physicians for a Healthy Environment (UPHE)
-0137	Citizen Commenter
-0138	Citizen Commenter
-0139	Citizen Commenter
-0140	Citizen Commenter (repeat of -0139)
-0141	Citizen Commenter
-0142	Citizen Commenter
-0143	Citizen Commenter
-0144	Citizen Commenter (Sierra Club mass mailer, comment submitted via Regs.gov)

-0145	Citizen Commenter
-0146	Anonymous Commenter
-0147	Citizen Commenter
-0148	Citizen Commenter (Sierra Club mass mailer, comment submitted via Regs.gov, repeat of -0144)
-0149	Anonymous Commenter
-0150	Citizen Commenter
-0151	Anonymous Commenter
-0152	Carbon County Board of Commissioners
-0153	NPS Regional Director
-0154	National Park Service (NPS)
-0155	Edison Electric Institute
-0156	Colorado Conservation Organizations
-0157	Conservation Organizations, Vicki Stamper Report
-0158	Conservation Organizations, Dr. Gray Report
-0159	Utah Division of Public Utilities
-0160	Utah Department of Air Quality (UDAQ)
-0161	Wasatch Clean Air Coalition
-0162	PacifiCorp
-0163	Utah Associated Municipal Power Systems (UAMPS)
-0164	Citizen Commenter
-0165	Utah Mining Association (UMA)
-0166	Utah Citizens Advocating Renewable Energy (UCARE)
-0167	Conservation Organizations Cover Letter and Exhibits (Conserv Orgs)
-0168	Utility Air Regulatory Group (UARG)
-0169	PacifiCorp, corrected
-0170	Sierra Club, early comments
-0171	Citizen Commenter
-0172	Utah Physicians for Healthy Environment (UPHE) Part 1
-0173	UPHE, Part 2
-0174	Mass Mailer, Distinct Submissions, Sierra Club
-0175	Protect our Winters (POW)
-0176	Colorado Organizations
-0177	Mass Mailer, Industry
-0178	Mass Mailer, Coal Company Employees
-0179	UCARE, Second Submittal

the same. Similarly, the annual emission limit for the Dry Fork plant in Wyoming of 0.05 lb/MMBtu, compares very favorable to that set by EPA for Utah BART EGUs when taking into consider the much longer averaging period (i.e., annual vs. 30 days). That is, if the annual limit for Dry Creek were instead expressed on a 30-day averaging period, it would be necessarily higher and likely close to the 0.07 lb/MMBtu limit set by EPA.

Comment: [NPS Tech, p. 2] Of 1,222 plants, EPA Clean Air Markets (CAM) data for 2014 rank the Hunter facility #27 for NO_x at 11,595 tons. On an emission per unit of electrical output basis, Hunter ranked #188 worst for SO_2 and #197 worst for NO_x. Hunter also ranked #273 for emissions of CO2 per unit of electricity produced.

Response: Comment noted.

Comment: [NPS Tech, p. 2] Of 1,222 plants, CAM data for 2014 rank the Huntington facility #72 for NO_x at 6,864 tons. On an emission per unit of electrical output basis, Huntington ranked #233 worst for SO_2 and #235 worst for NO_x. Huntington also ranked #309 for emissions of CO2 per unit of electricity produced.

Response: Comment noted.

Comment: [Conserv Orgs, p. 18] SCR Constitutes BART for NO_x Emissions From Hunter Units 1 and 2 and Huntington Units 1 and 2 The Conservation Organizations support EPA's co-proposal finding that SCR constitutes BART for NO_x emissions from Hunter Units 1 and 2 and Huntington Units 1 and 2. Not only does EPA's five-factor BART analysis support SCR as BART—predicting some of the most significant visibility improvements at some of the lowest costs estimated across the Regional Haze Program—but the Conservation Organizations' own analyses validate EPA's.

Response: Comment noted.

5. General

a. Economic and Employment Concerns

Comment: [Carbon County, pp. 1 and 2] Carbon County is most concerned that, based on testimony from the Navajo tribe with a population of 166,826, how the loss of nearly 1,000 jobs between the plant and the mine would be too great of an impact to the tribe. Yet the loss of 1,260 direct and 1,850 indirect jobs between the mines and power plants and our supporting businesses in the Carbon/Emery County area with a combined population of 31,737 somehow does not measure up to a major economic impact to the area and our citizens? Why has no testimony been taken on the impacts to our area? How can EPA's conclusion, given the facts of this action, not be interpreted as Federal discrimination?

Response: It is not EPA's intention to endanger the economic viability of the PacifiCorp BART units or to place an undue burden on PacifiCorp's customers in making our final FIP determinations. However, neither the CAA nor the RHR provide for consideration of the affordability of controls, ratepayer impacts or potential job losses as part of a BART determination analysis. Rather, they require consideration of "the costs of compliance, the energy and non-air quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology."[560]

It is not clear which action the commenter is referring to in discussing testimony from the Navajo Nation. EPA has recently promulgated two source-specific FIPs to implement the RHR for sources on Navajo Nation – one for Four Corners Power Plant[561] and one for Navajo Generating Station.[562] The legal and policy context for those actions differed significantly from the instant case. In particular, in promulgating FIPs in Indian Country, EPA was acting in part, under the Tribal Authority Rule,[563] which provides additional flexibility not otherwise available under the CAA and RHR.[564] In addition, in undertaking the Four Corners Power Plant and Navajo Generating Station actions, EPA engaged in consultation with tribes and tribal authorities, consistent with the federal trust responsibility to Indian tribes, Executive Order 13175: Consultation and Coordination With Indian Tribal Governments, and the *EPA Policy on Consultation and Coordination with Indian Tribes* (May 5, 2011).[565] As part of that consultation, EPA undertook certain economic analyses to assess potential rate impacts to the Navajo Nation and other affected tribes.[566] No such potential impacts to tribes have been identified in the current case.

The commenter appears to misunderstand that an analysis of "non-air quality environmental impacts" must include economic effects. In fact, the plain language of the statute, as well as the RHR, makes clear that the economic effects factor is limited to non-air quality environmental impacts.[567] The BART Guidelines note that examples of such impacts would include "solid or hazardous waste generation and discharges of polluted water from a control device."[568] Additionally, the BART Guidelines do allow for (but do not require) the consideration of "significant economic disruption or unemployment" as part of "energy impacts." Specifically, the Guidelines provide that:

---

[560] CAA section 169A(g)(2), 42 U.S.C. 7491(g)(2); 40 CFR 51.308(e)(1)(ii)(A).
[561] 77 FR 51620.
[562] 79 FR 46514.
[563] 40 CFR part 49
[564] *See* 79 FR 46517 – 46518.
[565] Available at: https://www.epa.gov/sites/production/files/2013-08/documents/cons-and-coord-with-indian-tribes-policy.pdf
[566] *See*, e.g. 77 FR 51625 – 51626, 79 FR 46548-46549
[567] Id.
[568] BART Guidelines section IV.D.4.h

> * * * the energy impacts analysis may consider * * * whether a given alternative would result in significant economic disruption or unemployment. For example, where two options are equally cost effective and achieve equivalent or similar emissions reductions, one option may be preferred if the other alternative results in significant disruption or unemployment.[569]

The Guidelines also allow for consideration of "affordability" as part of the "costs of compliance" under certain circumstances:

> 1. Even if the control technology is cost effective, there may be cases where the installation of controls would affect the viability of continued plant operations.
>
> 2. There may be unusual circumstances that justify taking into consideration the conditions of the plant and the economic effects of requiring the use of a given control technology. These effects would include effects on product prices, the market share, and profitability of the source. Where there are such unusual circumstances that are judged to affect plant operations, you may take into consideration the conditions of the plant and the economic effects of requiring the use of a control technology. Where these effects are judged to have a severe impact on plant operations you may consider them in the selection process, but you may wish to provide an economic analysis that demonstrates, in sufficient detail for public review, the specific economic effects, parameters, and reasoning.[570]

Thus, only under "unusual circumstances" where a potential control option is expected to have a "severe impact on plant operations" or "result in significant economic disruption or unemployment" can we consider economic effects as part of a BART determination. In this case, we lack evidence to support the assertions that our proposed FIP would result in significant rate increases, jeopardize the plant's operations, or result in any other economic effects. In the absence of such evidence, commenter's assertions regarding job losses are speculative, and we cannot consider them as part of our BART determination.

Comment: **[Carbon County, p. 2]** We see this proposed rule as a way to control lands around Monuments, National Parks Wilderness areas or any area deemed necessary by the EPA or the governing Administration with the purpose of reducing the productivity of goods or resources which devalues the area creating catastrophic economic impacts to area residents and the local government.

Response: The commenter has made an unsubstantiated claim regarding implementation of the regional haze program. In accordance with section 169A of the CAA, EPA, in consultation with

[569] Id. section IV.E.2.
[570] Id. section IV.E.3.

Comment: [Docket ID-0165] The Utah Mining Association (UMA) is a 101-year old, 120-member, non-profit, non-partisan trade association representing the interests of the mining industry in Utah. UMA members are actively involved in exploration and mining operations on public and private lands throughout the state. Our diverse membership includes every facet of the mining industry, including geology, exploration, mining, engineering, power generation, equipment manufacturing, legal and technical services, and sales of equipment and supplies. As significant energy ratepayers, our members are directly affected by the EPA's proposal.

Response: Comment noted.

Comment: [Transcript pp. 119-120] One commenter noted that the proposed FIP will require Rocky Mountain Power to spend nearly 700 million dollars. Rocky Mountain Power has a customer base of approximately 83,000 households. The FIP, if implemented, will cost each of these households $8,434. This hurts every citizen of that system, especially the low and fixed income families. The FIP would provide less than one deciview improvement on average which is not noticeable to the human eye. The federal government would be forcing the rate payers of Utah to pay a great cost for something that they cannot even see.

Response: First, we disagree that our FIP will require Rocky Mountain Power to spend $700 million dollars. EPA's revised estimate of the total capital costs for the FIP is $517 million dollars. Second, EPA's evaluation of capital and annual expenses associated with implementation of the FIP shows such expenses to be justified by the degree of improvement in visibility in relationship to the cost of implementation. We note that for electric utilities, while EPA has not customarily analyzed or considered ratepayer impacts in BART determinations,[576] it is readily apparent that the household cost impacts suggested by the commenter are significantly overstated. Based on other economic analyses we have reviewed,[577] residential customers are more likely to experience rate increases in the range of 5-10% due to installation of SCR controls required by the FIP. While these projected rate increases are not trivial, they are comparable to average historical rate increases for Rocky Mountain Power (aka PacifiCorp), Utah, and U.S. ratepayers.[578]

---

[576] Exceptions include EPA's Regional Haze FIP for Hawaii, where we analyzed potential rate impacts due to the unique energy situation in Hawaii, (77 FR 61478, 61488 (Oct. 9, 2012));, EPA's BART FIP for Four Corners Power Plant, where we examined potential rate impacts as part of tribal consultation, (77 FR 51620, 51625-51626 (Aug. 24, 2012));, and EPA's BART FIP for Apache Generating Station to understand the rate impacts on Arizona Electric Power Cooperative as a small entity, (77FR 72512 (Dec. 5, 2012)).

[577] Apache Plant: Report on SCR Incremental Cost Assessment, November 9, 2012 [original EPA docket ID EPA-R09-OAR-2012-0021-0211 and also included in the docket for this action] and The Cost of Clean Air, Effects of Air Pollution Controls on Electric Rates in North Dakota and Minnesota, Paul Chernick, November 7, 2011 [original EPA docket ID EPA-R08-OAR-2010-0406-0213, Attachment 5 and also included in the docket for this action.]

[578] Energy Information Administration (EIA) State Historical Tables for 2014, Released: February 19, 2015. Average Price by State by Provider, 1990-2014. http://www.eia.gov/electricity/data.cfm#sales, last accessed June 1, 2016.

To: Schwab, Justin[schwab.justin@epa.gov]
From: Greenglass, Nora
Sent: Wed 5/24/2017 1:01:10 PM
Subject: RE: More UT regional haze
2006 RHR Amendments (BART Alt) FR.pdf
2005 BART Guidelines FR.pdf
DENVER-#560948-v1-As-filed_Utah_Stay_Opposition.pdf
DENVER-#560950-v1-As-filed_Utah_Stay_Opp_Exhibits.pdf
Ariz. ex rel. Darwin v. United States EPA__2016 U.S. App. LEXIS 3196.pdf

Okay, attached are the 2005 BART Guidelines, 2006 BART Alternatives Rule, Arizona ex rel Darwin, our stay opp, and the exhibits we filed with our stay opp.

-----Original Message-----
From: Schwab, Justin
Sent: Tuesday, May 23, 2017 9:18 PM
To: Greenglass, Nora <Greenglass.Nora@epa.gov>
Subject: Re: More UT regional haze

Ok I lied. One more: then Bart guidelines, at 70 FR 39104.

I really hope that'll be all I ask you for. For now. Thank you for pulling all of this for me.

Sent from my iPhone

> On May 23, 2017, at 9:14 PM, Schwab, Justin <schwab.justin@epa.gov> wrote:
>
> And, hopefully finally, please resend our motion in opposition to stay.
>
> Sent from my iPhone
>
>> On May 23, 2017, at 9:07 PM, Schwab, Justin <schwab.justin@epa.gov> wrote:
>>
>> If I don't already have it (if I do please resend):
>>
>> - 2006 Bart alternatives rule (71 FR 60612)
>> - Arizona ex rel Darwin v EPA, 815 F3d 519 (9th Cir. 2016)
>>
>> Thank you!
>>
>> Sent from my iPhone

To: Schwab, Justin[schwab.justin@epa.gov]; Zenick, Elliott[Zenick.Elliott@epa.gov]; Srinivasan, Gautam[Srinivasan.Gautam@epa.gov]
From: Greenglass, Nora
Sent: Fri 5/19/2017 7:13:19 PM
Subject: Utah reconsideration petitions
Deseret Power Petition for Reconsideration cr - 2(1).pdf
PC Request Recon + Admin Stay.s.pdf
UAMPS Request Reconsideration + Administrative Stay.pdf
RHR Amendments Proposal.pdf
3 Petitions for Reconsideration of Utah Regional Haze Final Rule.docx

The three Utah regional haze reconsideration petitions are attached; we received petitions from PacifiCorp, Deseret, and Utah Municipal Power Systems. Utah submitted a petition for an administrative stay, but not a reconsideration petition.

The attached Word document pulls together bullets on these reconsideration petitions from a couple of different briefing papers. I'm also including a PDF of the proposed RHR Revisions, which PacifiCorp's petition references.

Nora Greenglass

Office of General Counsel

U.S. Environmental Protection Agency

202-564-3095 (office)

Ex. 6 - Personal Privacy (cell)

DESERET POWER
ELECTRIC COOPERATIVE

10714 South Jordan Gateway
South Jordan, Utah 84095
(801) 619-6500 Fax: (801) 6196599

September 6, 2016

Via E-Mail and Certified U.S. Mail

The Honorable Gina McCarthy
Administrator, U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
(McCarthy.Gina@epa.gov)

Shawn McGrath
Region 8 Administrator
U.S. Environmental Protection Agency
1595 Wynkoop Street
Denver, Colorado 80202
(r8eisc@epa.gov)

Re: Request for Reconsideration and Request for Administrative Stay of EPA's Final Rule: "Approval, Disapproval and Promulgation of Air Quality Implementation Plans; Partial Approval and Partial Disapproval of Air Quality Implementation Plans and Federal Implementation Plan; Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze; Final Rule." Docket ID No. EPA-R08-OAR-2015-0463

Dear Administrators McCarthy and McGrath:

Deseret Power Generation & Transmission Corporation ("Deseret Power") respectfully requests that the U.S. Environmental Protection Agency ("EPA" or "Agency") reconsider and grant an immediate administrative stay of the compliance deadline and toll the effective date of certain requirements in the Agency's final rule cited above. 81 Fed. Reg. 43,894 (July 5, 2016) ("Final Rule"). Deseret Power understands that PacifiCorp Energy submitted a comprehensive Petition for Reconsideration on September 2, 2016 ("PacifiCorp Petition"), and Deseret Power incorporates by reference the PacifiCorp Petition into this petition and has attached it hereto as Exhibit A. In this petition, Deseret Power specifically highlights the unique impact the EPA's Federal Implementation Plan for Regional Haze for Utah ("FIP" or "BART NOx FIP") would have on Deseret Power's operation and ability to supply power to its electricity cooperative customers.

Deseret Power is a 25% minority interest owner of the Hunter 2 Unit in Emery County, Utah. As noted in the PacifiCorp Petition on page 2, the FIP requires the owners of the Hunter 2 plant to begin expenditures of millions of dollars to meet the FIP requirements by 2021. The FIP requires these significant capital investments based the Agency's premise that the FIP Best Available Retrofit Technology ("BART") requirements (namely the requirement to install selective catalytic reduction ("SCR") systems at the Hunter 2 facility) will result in greater visibility improvements than the State of Utah's BART Alternative.

For reasons set forth in detail in the PacifiCorp Petition, the EPA's Final Rule is legally flawed and PacifiCorp, along with other petitioners like Deseret Power, are likely to succeed on the merits of claims challenging the legality of the Final Rule. Deseret Power does not intend to rehash those arguments in its petition, but incorporates such arguments here. Moreover, a stay should be granted because both PacifiCorp and Deseret Power will be irreparably harmed by the imposition of the FIP[1], the public interests favor a stay, and no significant harm from a stay will result for either EPA or the public. In its petition, Deseret Power will supplement PacifiCorp's already sound arguments supporting both a stay and EPA reconsideration with additional arguments specific to Deseret Power and its unique status as an electric cooperative.

Deseret Power's supplemental arguments are two-fold. First, with respect to the request for reconsideration, Deseret Power agrees with PacifiCorp that the Regional Haze Rule, 40 C.F.R. § 51.308(d)(1)(i)(B), requires implementation of BART controls before the compliance deadline of the first reasonable progress period, which is July 31, 2018—but the Final Rule calls for implementation of BART controls by 2021—a departure from the clear meaning of the rule. This was the specific holding of the 5th Circuit in *Texas v. EPA*, No. 16-60118, 2016 WL 3878180 (5th Cir. July 15, 2016), a decision released after the Final Rule. This new information plus the unique nature of Deseret Power's inability to raise capital for SCR installation by 2021 or by 2018 makes EPA's FIP untenable. Accordingly, EPA should reconsider the Final Rule in light of this new Fifth Circuit ruling.

Second, with respect to the request for stay, Deseret Power is not similarly able to pass along the costs of compliance with the BART NOx FIP (i.e. installation of SCR) to its customers like PacifiCorp is able to do. This makes the irreparable injury requirement for imposition of a stay particularly strong in Deseret Power's favor.

Like PacifiCorp, Deseret Power requests that EPA grant an immediate stay of the BART NOx FIP and to reconsider its rejection of the Utah RH SIP and BART Alternative.

[1] As noted in PacifiCorp's Petition, Deseret Power and Utah Associated Municipal Power Systems, and Utah Municipal Power Agency are co-owners of, and receive a portion of, the electrical output from certain affected units at the Hunter 2 plant. All of these entities are substantially impacted by the Final Rule.

I. The EPA Should Reconsider the Final Rule Because New Law Rejecting Similar EPA Action Has Been Released Since Promulgation of the Final Rule.

The CAA requires the Administrator of EPA to convene a reconsideration proceeding if "it was impracticable to raise [an] objection" to a final EPA action within the time for public comment or if "the grounds for such objection arose after the period for public comment (but within the time specified for judicial review)" and such objection is "of central relevance to the outcome of the rule." 42 U.S.C. § 7607(d)(7)(B). The CAA further provides that "documents which become available after the proposed rule has been published and which the Administrator deems are of central relevance to the rulemaking shall be placed in the docket as soon as possible after their availability." 42 U.S.C. §7607(d)(4)(B)(i).

On July 15, 2016, the Fifth Circuit rejected EPA's attempt to impose BART controls with an implementation time frame longer than the 10-year reasonable progress planning window, which ends on July 31, 2018. *Texas v. EPA*, No. 16-60118, 2016 WL 3878180, at *34 (5th Cir. July 15, 2016). This decision was released just ten days after the Agency released the Final Rule in this case. The Fifth Circuit decided that where EPA imposes a FIP,

> it stands in the position of the state with all the same requirements and powers the state had in initially drafting its SIP. Here, the state implementation plans under review only cover the period up to 2018. Yet EPA's federal implementation plan requires power plants in Texas to meet reasonable progress goals by installing scrubbers in 2019 and 2021. Petitioners persuasively argue that this exceeds the power granted by the Regional Haze Rule.

Like the state of Texas, the State of Utah submitted its SIP with the BART Alternative, which could be completed within the 10-year reasonable progress window ending in 2018 and demonstrated that the BART Alternative would achieve all reasonable progress goals by that date. *See* Progress Report for Utah's State Implementation Plan for Regional Haze at F-11, Table 2.1 (May 18, 2015). The EPA is, therefore, only authorized by the Regional Haze Implementation Rule to stand in the shoes of the state and impose a BART control strategy that can be completed within the compliance window—by 2018. *See* 40 C.F.R. § 51.308(d)(1)(i)(B). And yet, EPA, in the Final Rule, imposes BART controls to be implemented by 2021 in clear contravention of the rule and contrary to the Fifth Circuit's holding in *Texas v. EPA*. Final Rule at 43,924. In light of this recent circuit court decision, EPA should reconsider the Final Rule because a major premise of the Final Rule was specifically rejected by the Fifth Circuit. Such a precedent is certainly of "central relevance" to the outcome of the rule.

EPA's violation of its own rule is particularly troubling for Deseret Power. Due to its unique structure and troubled debt workout agreements, which govern Deseret Power's ability to make capital investments, Deseret Power may be precluded from issuing new debt instruments to raise the capital necessary to install SCR at Hunter 2. Deseret Power is uniquely challenged to

raise the necessary capital, regardless whether the SCR were to be installed either within the 2018 reasonable progress window or the improperly imposed 2021 deadline under the FIP. EPA's inability to follow its own rule creates a scenario where controls were selected by EPA without permitting the State of Utah to first evaluate, analyze, and take action to determine the necessary constraints of time, costs of compliance during the next 10 year reasonable progress window, or the ability of each impacted utility for implementation of EPA's top-down mandate. Reconsideration is warranted here.

II. Under the Ruling of *Texas v. EPA*, and EPA's own Regional Haze Guidance, EPA Must Defer to and Refrain From Interfering In the State of Utah's Congressionally Delegated Prerogative to First Consider and Develop Reasonable Progress Requirements and Corresponding BART Determinations for the Second 10 Year Reasonable Progress Period.

As noted in the Court's Decision in *Texas v. EPA,* "When it promulgated the Regional Haze Rule, EPA elected to bind states to a ten-year revision period. 40 C.F.R. § 51.308(f). When EPA steps into the shoes of a state to develop a federal implementation plan, that period is binding on EPA as it was on the state. *See* 77 Fed. Reg. at 40,164 ("At the point EPA becomes obligated to promulgate a FIP, EPA steps into the State's shoes, and must meet the same requirements. . . .")." *Id.* p.7n.7

The Regional Haze Rule requires **states** to "consider . . . the emission reduction measures needed to achieve [the reasonable progress goal] *for the period covered by the implementation plan*," 40 C.F.R. § 51.308(d)(1)(i)(B), (d)(3) (emphasis added). The State of Utah has not yet been given the opportunity, nor has it taken the necessary steps to collect, analyze, propose, and gather comment on the four defined factors required to be considered under the Clean Air Act for the next 10 year period.

In adopting its FIP, EPA "jumps over" the statutory, procedural, and constitutional due process afforded not only to the State of Utah, but to Deseret Power, as one of the utilities that will be impacted directly by the plan(s), costs, and objectives to be established for the next 10-year Reasonable Progress Period. Congress unequivocally delegated to the State, not to EPA, the prerogative and the responsibility to first determine and establish those objectives that will be pursued as part of a Regional Haze plan for the following period.

Instead, EPA's FIP requires Deseret Power, as co-owner of the Hunter 2 Unit, to bear costs of installing expensive control technology on its unit, without any benefit whatsoever of a State-developed process. The State of Utah has neither refused nor failed to undertake and complete the process toward developing such a plan for the next 10 year period.[2] The EPA FIP

[2] EPA has proposed to revise the Regional Haze Guidance to remove language tying controls to the "period covered by the implementation plan," but its proposed revision would do nothing to alter the State's prerogative to first consider, for whatever period is under consideration, the

is, in this regard, completely devoid of considerations such as the contribution of other potential source(s) of pollution to be taken into account in achieving the Reasonable Progress goals for the next 10 year period (or whatever the period may be which will follow the initial 10 year Period ended 2018). Likewise, EPA's FIP deprives Deseret Power its right to participate in the State of Utah's process of considering possible alternative compliance approaches under a "holistic," and "alternative" scheme, as that right is afforded to the State under the Clean Air Act. EPA must defer to Utah and allow the State, not EPA, to first establish goals to be achieved during the next Reasonable progress period. Those objectives, as established by the State, not EPA, must be honored so long as the State establishes goals that comply with the Act. *See* 42 U.S.C. § 7410(k)(3) (EPA "shall approve" a state implementation plan that satisfies the requirements of the Act); *Luminant*, 675 F.3d at 921.

EPA's complete lack of deference to the state in forcing measures designed to address air visibility conditions and effects during the next 10 year reasonable progress period "inverts the agency's "ministerial function" in this system of "cooperative federalism." *Texas v. EPA, p.31, quoting Luminant*, 675 F.3d at 921.

III. Deseret Power Will Suffer Unique and Immediate Irreparable Harm if the Final Rule is Not Stayed.

EPA should stay implementation of the BART NOx FIP requirements because there are numerous legal and technical flaws in the Final Rule. Because the FIP is dependent upon EPA's decision to reject the BART Alternative, EPA should stay the entire Final Rule.

The legal standard for an administrative stay is even broader than the standard for a judicial stay. The Administrative Procedures Act grants EPA authority to stay the BART NOx FIP's requirements when "justice so requires . . . pending judicial review." 5 U.S.C. § 705. Despite this broad authority to grant stays, agencies often apply the more specific criteria governing preliminary injunction requests when determining whether a stay should be granted. *See Affinity Healthcare Servs. v. Sebelius*, 720 F. Supp. 2d 12, 15 (D.D.C. 2010) ("Motions to stay agency action pursuant to [5 U.S.C. § 705] are reviewed under the same standards used to evaluate requests for interim injunctive relief."). "A plaintiff seeking a preliminary injunction must establish that he is likely to succeed on the merits, that he is likely to suffer irreparable harm in the absence of preliminary relief, that the balance of equities tips in his favor, and that an injunction is in the public interest." *Winter v. NRDC*, 555 U.S. 7, 20 (2008); *see also RoDa Drilling Co. v. Siegal*, 552 F.3d 1203, 1208 (10th Cir. 2009) (same).

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objectives to be met and the factors to be weighed in developing an overall plan for achieving those objectives. EPA simply has not afforded the state of Utah its Congressionally mandated right to first undertake this consideration; EPA instead simply usurps the State's role entirely with respect to any period following the initial 10 year Reasonable Progress Period established at the time Utah promulgated its proposed SIP.

PacifiCorp has provided, in the PacifiCorp Petition, an extensive analysis of why petitioners, like PacifiCorp and Deseret Power, are likely to succeed on the merits of claims that the Final Rule is illegal and should be rejected. These arguments will not be re-asserted here, but are incorporated by reference.

PacifiCorp has identified for EPA the enormous, unnecessary, and unreasonable impacts that compliance with the FIP mandate would pass through in the form of increased electricity rates to ratepayers. Those rates and ratepayers also include rural residents and small businesses located in areas of the State and in tribal areas where the rural electric cooperatives which Deseret Power serves provide electricity.

Deseret Power, however, will suffer unique irreparable harm that is different and in addition to the ill effects that PacifiCorp and others will feel. EPA should evaluate these impacts specific to Deseret Power as this level of irreparable harm is easily sufficient alone to warrant the grant of an administrative stay.

III.A. The FIP Requirement for Hunter Unit 2 Threatens Deseret Power's Financial Condition and Poses an Intolerable Risk of Forfeiture of Deseret Power's Rights Under the Terms of a Debt Forbearance Arrangement With Its Creditors.

Since the late 1990's, Deseret Power has operated under the terms of a long-term debt forbearance arrangement with its creditors. The forbearance arrangement was necessitated by market forces in the late 1980's and early 1990's which made it impossible for Deseret Power to recover fully its costs of constructing the utility plant and equipment it operates. One major source of this financial distress was the long-term indebtedness secured by Deseret Power's interest in the Hunter 2 Unit – debt that Deseret Power has not been able to service or pay. With the prevailing conditions in place at that time, Deseret Power found itself unable to make payment under the debt as payments fell as due under the loan(s) secured by Deseret Power's ownership interest in Hunter 2.

Deseret Power's creditors have agreed to forbear from collecting the full amount of unpaid indebtedness for the Hunter 2 Unit mortgage, on the condition that Deseret Power fully comply with certain specified terms of the long-term debt restructuring and forbearance agreement. One key element of that agreement requires that Deseret Power covenant not to incur any new long-term indebtedness while the existing creditors continue to forbear from exercising remedies to collect on the full unpaid Hunter 2 and other delinquent debt owed to them.

Should the FIP be allowed to remain in place and on the current time schedule, Deseret Power's share of capital costs for the required additions at Hunter 2 would surpass its available cash reserves. As currently projected, Deseret Power would not be able to pay for the capital improvement of SCR at Hunter 2 prior to 2026. After 2026, a significant portion of the pre-existing debt is scheduled to be forgiven – subject to Deseret Power's adherence to the particular

terms spelled out in the forbearance arrangement. In short, Deseret Power could not pay for its portion of SCR at Hunter 2 as set forth in the FIP without seeking new, substantial long term debt.

Incurring such an amount of new debt prior to 2026, without a new consensual arrangement with its existing creditors, could virtually ensure a violation of the forbearance terms. Should such a violation result in the waiver or termination of creditors' forbearance obligations under the agreement, Deseret Power would find itself hopelessly unable to make payment on nearly $2 Billion in pre-existing debt – far in excess of its ability to satisfy.[3] The obvious result would almost certainly lead to a bankruptcy of Deseret Power. A bankruptcy filing is one of the most severe forms of irreparable harm one can suffer and clearly satisfies this element of imposing a stay. *See, e.g., Doran v. Salem Inn, Inc.*, 422 U.S. 922, 932 (1975) (Where a party "would suffer a substantial loss of business and perhaps even bankruptcy…[c]ertainly the latter type of injury sufficiently meets the standards for granting interim relief, for otherwise a favorable final judgment might well be useless."). The threat of such a bankruptcy is real for Deseret Power, should the requirement of the FIP be allowed to remain in place.

Alternatively, Deseret Power could attempt, with only uncertain assurance of success, to seek a voluntary accommodation from its creditors effectively equating to a major restructuring of all of Deseret Power's long term indebtedness. In any such arrangement, Deseret Power would expect to be required to make significant, harsh, and irreparable concessions to the creditors.

Deseret Power could not conceivably raise its rates to its tariff customers (those customers served under ordinary residential/commercial rate tariffs by Deseret Power's distribution cooperative members) in time, or in an amount sufficient to pay off the full amount of debt which would come due and payable should the existing creditors no longer be required to forbear from collecting unpaid debt.[4]

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[3] Deseret Power has available a sizeable sum of payment credit that could be applied to satisfy scheduled restructured payments under the long term forbearance; although the amount of such credit could be applied to scheduled restructured debt payment, it is already projected that Deseret Power will likely need the full amount of available payment credit to permit its compliance with operational demands including costs of compliance with the anticipated Clean Power Plan for controlling carbon dioxide emissions from Deseret Power's existing generating sources.

[4] For illustrative purposes, the entire remaining principal payments that will be paid by Deseret Power under the heavily reduced minimum payment requirements of the forbearance arrangement will not likely exceed approximately $182 million, plus interest recognized on such payments. By comparison, the unpaid outstanding balance of delinquent indebtedness that would become due and payable, should a default by Deseret Power result in terminating

III.B. Absent an Immediate Stay of the FIP, Deseret Power Risks Immediate Creditor Remedies Associated With a Potential Projected Future Cash Shortfall.

Even if Deseret Power could avoid an eventual bankruptcy triggered by the sizeable capital costs of SCR at Hunter 2 under the FIP, the terms of the existing forbearance will result in immediate restrictions on Deseret Power's rates and operations, unless the FIP is stayed.

Deseret Power is a cooperative that does not have any source of equity investment capital except through rates and charges assessed to its members for electricity that it sells and delivers. Contrary to EPA's simplistic assertion in the Final Rule, Deseret Power simply does not have the ability to raise customer rates to generate capital for financing the sizeable cost to install SCR at Hunter 2.

The SCR for Hunter 2 will cost approximately $145 million, and of that, Desert Power will be responsible for contributing approximately $40 million. Not only is Deseret Power unable to generate capital costs by increasing rates of its customers, it is limited in its ability to incur new indebtedness of such a magnitude, at least while the existing forbearance arrangement remains.[5]

Even short of an eventual threatened bankruptcy filing, the very existence of the FIP, without immediate administrative or judicial stay, brings with it irreparable damage for Deseret Power. Under the forbearance arrangement, prior to November 15 of each year, Deseret Power must provide revised forward projections to its creditors of anticipated cash flows (or deficits) through approximately 2025. This revised cash flow projection, which Deseret Power will be

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creditor's forbearance obligation, could surpass $2 Billion by the time the FIP would require installation of equipment at Hunter 2. Annual interest accrual alone on such an amount would nearly equal the total gross revenue generated by Deseret Power in a given year, without deducting any costs (labor, fuel, materials, etc.) associated with generating such revenue. Simply put, such an amount would be legally, practically, and economically impossible to recover through Deseret Power's electric rates and charges to its members and/or other customers.

[5] Deseret Power could, if necessary, undertake new additional indebtedness for large projects such as an installation of SCR at Hunter 2, if the installation were scheduled beyond early 2026—the current anticipated date for completion of a mandatory series of minimum debt payments under the terms of the forbearance. Provided nothing occurs to delay or prevent completing these payments and otherwise complying with debt covenants under the agreement, Deseret Power would once again find itself free to raise new funding for large capital improvements through new debt issued after the satisfaction of those requirements.

required to submit later this year, would result in *immediate restrictions on Deseret Power's use of available cash flow*, should it reflect a future projected cash flow deficit of sufficient magnitude that calls into question its ability to make scheduled minimum debt service payments consistent with the terms of the agreement.

Among the remedies Deseret Power's creditor will immediately acquire, upon such a projected cash flow shortfall, Deseret Power's annual operating budgets, rebate programs to its Members, capital rotation payments to member cooperatives, and other similar payments must immediately cease or be approved on a case-by-case basis by the unpaid creditors. These creditor remedies will become active *immediately* once Deseret Power delivers updated long term cash flow projections that show Deseret Power's inability to meet cash requirements through 2025 as those are projected to come due.

Deseret Power uses available "free" cash flow for a number of vital and important organizational purposes. In addition, submitting Deseret Power's operating budgets to creditor approval places Deseret Power and its elected Governing Board in an untenable, irreparable position of risking long term economic growth and planning for the utility, in order to acquiesce to the short-term, narrow focus of dissatisfied creditors.

Among the very immediate ramifications that could flow from Deseret Power delivering such a revised cash flow projection:

- Deseret Power relies on making cash rebates to its six rural electric cooperative members to equalize and stabilize rate effects among the six rural organizations. Should the creditors place these cash rebates on hold, the result will be to greatly increase all of the rates paid by these rural electric cooperatives and passed through to rates charged for electricity served to rural homes and communities. Some members in portions of Wyoming and elsewhere would see much more dramatic, unplanned, and sudden increases in rates than other areas, because the FERC-approved rebates serve to levelize and equalize rates among the Deseret Power distribution members.

- Deseret Power would be precluded from funding Energy Efficiency Improvement programs – investment programs designed to increase efficient use of electricity, thereby optimizing the amounts paid by ultimate electricity consumers.

- Deseret Power would be forced to re-evaluate labor costs and compensation levels, in order to satisfy creditor demands in seeking approval of annual operating budgets.

- Deseret Power would be precluded from making cash payments to member distribution cooperatives to rotate capital margins (cash paid in excess of operating costs) accumulated during past years. Deseret Power normally retires

accrued patronage capital credits to its members on a regular basis. Creditors would most certainly prohibit such payments, at least through 2025.

- Other major maintenance projects at Deseret Power's plants (including approval for projects at the jointly owned Hunter 2 Unit), together with capital improvement funding for the coal mining operations of Deseret Power's wholly owned subsidiary would be severely restricted or curtailed for the coming years through 2025.

Absent an administrative or judicial stay of the FIP, *even if the FIP is ultimately modified or judicially invalidated,* Deseret Power will have been damaged *beginning this year.* Even if the FIP is eventually modified by EPA and/or invalidated by Court action, Deseret Power will suffer the damage of the foregoing effects for as long as the ongoing consideration of the FIP continues. Under the terms of the forbearance arrangement with its creditors, much of these damages will never be recovered, even if Deseret Power, PacifiCorp, and the State of Utah ultimately prevail on the merits.

But for a stay of the FIP, Deseret Power will be put to an intolerable Hobson's choice—it will be forced to undertake one of the following three intolerable courses of action, effective immediately:

(i) either report and project that it will need to incur additional long-term indebtedness to finance the Hunter 2 SCR installation costs (thereby likely triggering a negotiation with its existing creditor to accommodate such new additional debt); or

(ii) begin immediately to restructure its rates for electricity sold, its operational plans and levels of dispatch for its existing generation resources, as well as expenditures to reflect an "emergency" or "survival" budget, in order to generate increased net operational cash flows sufficient to pay the costs associated with SCR installation at Hunter 2 before the end of 2021 without the need for new indebtedness; or

(iii) project a major future cash flow deficit to accommodate the unavoidable cash outlays that would accompany SCR installation.[6] The latter would seriously

[6] Given the relatively short time period remaining before the 2021 compliance deadline for all BART eligible units under the FIP, attempting to devise a 5 year plan that could work around the projected cash flow shortfall from SCR installation at Hunter 2 would be painful, if it is even possible. It would require dramatic and immediate changes in Deseret Power's planned operations beginning immediately to take actions such as: dramatically reducing costs (with dramatic negative long term ramifications for the Company), raising member rates in

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> threaten to trigger immediate aggressive creditor rights which in turn would bear heavy negative impacts on Deseret Power's ability to continue to conduct its business affairs in the manner it currently does.

Even should Deseret Power prevail in its petition for relief, it will begin immediately to incur irreparable harm unless the FIP is stayed pending full reconsideration and/or adjudication.

For this reason, and the significant number of additional reasons set forth in the PacifiCorp Petition, the Agency should grant an administrative stay of the Final Rule. The Agency should also reconsider the Final Rule in light of the new information presented in this petition and the PacifiCorp Petition.

Sincerely,

/S/

David F. Crabtree
Vice President and General Counsel
Deseret Power Electric Cooperative
10714 South Jordan Gateway
South Jordan, Utah 84095

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anticipation of the coming cash deficit (raising negative consequences on small businesses and tribal interests throughout the economically disadvantaged areas served by Deseret Power's cooperative members and curtailing long-term revenue growth for Deseret Power and its member systems), adjust rebate programs and/or curtail investments planned in energy efficiency programs, etc. In addition, Deseret Power could conceivably be challenged before FERC in an attempt to successfully build a cash reserve in advance of the SCR installation through anticipatory rate adjustments.

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State of Utah et al. v. U.S. EPA et al., (consolidated)
Nos. 16-9541, 16-9542, 16-9543, 16-9545

UTAH ASSOCIATED MUNICIPAL POWER SYSTEMS'

MOTION FOR STAY

EXHIBIT B

UAMPS' Request for Reconsideration and Request for Administrative Stay of EPA's Final Rule: "Approval, Disapproval and Promulgation of Air Quality Implementation Plans; Partial Approval and Partial Disapproval of Air Quality Implementation Plans and Federal Implementation Plan; Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze; Final Rule," Docket ID No. EPA-R08-OAR-2015-0463 (September 2, 2016).

UAMPS
Utah Associated Municipal Power Systems

SMARTENERGY

September 2, 2016

Via E-Mail and Federal Express

The Honorable Gina McCarthy
Administrator, U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
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McCarthy.Gina@epa.gov

Shawn McGrath
Region 8 Administrator
U.S. Environmental Protection Agency
1595 Wynkoop Street
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r8eisc@epa.gov

Attn: Docket ID No. EPA-R08-OAR-2015-0463

Re: Request for Reconsideration and Request for Administrative Stay of EPA's Final Rule: "Approval, Disapproval and Promulgation of Air Quality Implementation Plans; Partial Approval and Partial Disapproval of Air Quality Implementation Plans and Federal Implementation Plan; Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze; Final Rule."

Dear Administrators McCarthy and McGrath:

Utah Associated Municipal Power Systems ("UAMPS") respectfully requests that the U.S. Environmental Protection Agency ("EPA") reconsider and grant an immediate administrative stay of the compliance deadline and toll the effective date of certain requirements in the EPA's final rule cited above, published at 81 Fed. Reg. 43,894 (July 5, 2016), ("Final Rule"). Specifically, UAMPS requests EPA reconsider and administratively stay the best available retrofit technology ("BART") requirements related to nitrogen oxide (NO_x) emission control equipment ("BART NOx FIP") at the Hunter power plant Unit 2 ("Hunter Unit 2") and other affected units. UAMPS also requests EPA reconsider its disapproval of Utah's regional haze state implementation plan.

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UAMPS
Utah Associated Municipal Power Systems

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UAMPS

UAMPS is a political subdivision of the State of Utah whose membership consists of 45 municipal and other community-owned electric utilities located in Utah, Nevada, New Mexico, Idaho, Wyoming, California, and Oregon. Most UAMPS members own and operate a local electric utility system that provides integrated retail electric service to residential, commercial, and industrial customers. UAMPS partners with its members to ensure that electricity is affordable and reliable.

UAMPS currently manages 17 separate projects that provide power supply, transmission, and other services to participating members. One of these projects is UAMPS part ownership in Hunter Unit 2. In addition to owning interests in or directly operating power plants and other sources of electrical power, UAMPS and its members regularly purchase power off the grid, and are, therefore, sensitive to market and regulatory forces that impact electricity affordability and reliability.

UAMPS submitted comments in the above referenced Docket on March 14, 2016 to the EPA's proposed rule, entitled "Approval Disapproval and Promulgation of State Implementation Plans; State of Utah; Regional Haze Rule Requirements for Mandatory Class I Areas," published at 81 Fed. Reg. 2004 (January 26, 2016), ("Proposed Rule").

UAMPS Interest in the Hunter Unit 2

The Hunter 2 Unit is a 430 MW coal-fired electric generating unit located in Emery County that is jointly owned by PacifiCorp, UAMPS and Deseret Generation & Transmission Co-operative and operated by PacifiCorp in conjunction with two other coal-fired units with a combined generating capacity of approximately 1472 MW.

UAMPS owns an undivided 14.582% ownership interest in Hunter Unit 2, which represents approximately 63 MW of generating capacity for UAMPS and its participating Members. Annually, this represents approximately 552,246 MWh hours. Twenty-three UAMPS Members participate in the Hunter Unit 2 project. These members consist of small municipalities and other community-owned public electric utilities. These participating members are all small, serving an average of 4,247 customers, and have populations less than 50,000.

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UAMPS Joins PacifiCorp's Arguments in Support of Reconsideration and Stay

PacificCorp also submitted a Request for Reconsideration and Request for Administrative Stay of EPA's Final Rule on September 2, 2016 ("PacificCorp's Request"), a copy of which is attached hereto as Attachment A. UAMPS supports PacificCorp's Request.

For purposes of this Request and to the extent consistent with UAMPS' partial ownership interest in Hunter Unit 2, UAMPS hereby adopts and incorporates as though fully set forth herein, the arguments set forth in PacificCorp's Request in support of reconsideration and stay of the Final Rule.

Additionally, UAMPS states, consistent with its partial ownership interest in Hunter Unit 2, if the requested stay is not granted UAMPS will be subject to substantial costs for the selective catalytic reduction ("SCR") system required under the BART NOx FIP for Hunter Unit 2—expenditures that would be wholly unnecessary if UAMPS' legal challenges to the BART NOx FIP are successful. Because these legal challenges are based on sound legal principles and are likely to succeed on the merits, and because a stay is in the public interest and necessary to prevent irreparable harm to UAMPS, its members and customers, EPA should grant UAMPS' stay request. In contrast, no significant harm will result to either EPA or the public from a stay of the Final Rule – particularly because many of the emission reductions and resulting visibility improvements contemplated under the Final Rule already are in place as required by the Utah SIP, and the Final Rule does not require further emission reductions until 2021.

As set forth in PacifiCorp's Request, PacificCorp and UAMPS are likely to succeed on the merits because the BART NO_x FIP is contrary to applicable law. EPA improperly rejected the State of Utah's regional haze state implementation plan ("Utah RH SIP"). EPA failed to conduct an adequate statutory five-factor BART analysis to justify SCR for the Utah BART Units. EPA has taken contradictory positions regarding the results of the BART analysis it did conduct. EPA's analysis and BART NOx FIP disregard the Congressional mandate that states have the primary role in designing regional haze programs and undermine the State of Utah's goal of improving visibility at a reasonable and responsible pace without causing unnecessary economic distress from higher electricity rates. EPA's rejection of the Utah RH SIP and imposition of the BART NOx FIP are also inconsistent with EPA's BART determinations in other states.

UAMPS thus joins PacificCorp's Request and requests EPA to grant an immediate stay of the BART NOx FIP and to reconsider its rejection of the Utah RH SIP and BART Alternative.

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Sincerely,

Mason Baker
Chief Legal Officer & General Counsel
Utah Associated Municipal Power Systems

Enclosure: Attachment A—PacifiCorp's Request

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To: Schwab, Justin[schwab.justin@epa.gov]
From: Greenglass, Nora
Sent: Mon 6/5/2017 4:21:53 PM
Subject: RE: Utah RH RTC
EPA-R08-OAR-2015-0463-0208 (3).pdf

RTC is attached.

-----Original Message-----
From: Schwab, Justin
Sent: Monday, June 05, 2017 11:58 AM
To: Greenglass, Nora <Greenglass.Nora@epa.gov>
Subject: Utah RH RTC

If there's a PDF of the response to comments, may I please have it?

Sent from my iPhone

Response to Comments for the Federal Register Notice for Air Quality State Implementation Plans; Approvals and Promulgations: Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze; Partial Approval and Partial Disapproval

Docket No. EPA-R08-OAR-2015-0463

June 1, 2016

*This Response to Comment Document was finalized on June 1, 2016. As shown in the "redline/strikeout" version of this document in the docket for this action, the Agency made non-substantive and formatting edits on June 9, 2016.

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List of Public Comments

Docket ID Number EPA-R08-OAR-2015-0463-xxxx	Commenter Name/Affiliation
-0031	Citizen Commenter
-0032	Anonymous Commenter
-0033	Anonymous Commenter
-0034	Anonymous Commenter
-0035	Anonymous Commenter
-0036	Anonymous Commenter
-0037	Citizen Commenter
-0038	Anonymous Commenter
-0039	Emery County Public Lands Administrator
-0040	Anonymous Commenter
-0041	Citizen Commenter
-0042	Anonymous Commenter
-0043	Citizen Commenter
-0044	Anonymous Commenter
-0045	Anonymous Commenter
-0046	Anonymous Commenter
-0047	Citizen Commenter
-0048	Citizen Commenter
-0049	Anonymous Commenter
-0050	Anonymous Commenter
-0051	Anonymous Commenter
-0052	Anonymous Commenter
-0053	Citizen Commenter
-0054	Anonymous Commenter
-0055	Citizen Commenter
-0056	Anonymous Commenter
-0057	Anonymous Commenter
-0058	Anonymous Commenter
-0059	Anonymous Commenter
-0060	Citizen Commenter
-0061	Citizen Commenter
-0062	Anonymous Commenter
-0063	Emery County Commissioner
-0064	Citizen Commenter
-0065	Citizen Commenter

-0066	Anonymous Commenter
-0067	Anonymous Commenter
-0068	Citizen Commenter
-0069	Citizen Commenter
-0070	Anonymous Commenter
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-0075	Citizen Commenter
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-0095	Anonymous Commenter
-0096	Citizen Commenter
-0097	Citizen Commenter
-0098	Anonymous Commenter
-0099	Anonymous Commenter
-0100	Mass Mailer Sample, National Parks Conservation Association (NPCA)
-0101	Mass Mailer Sample, Sierra Club
-0102	Mass Mailer Sample, Healthy Environment Alliance of Utah (HEAL Utah)
-0103	Anonymous Commenter
-0104	Anonymous Commenter
-0105	Anonymous Commenter

-0106	Anonymous Commenter
-0107	Citizen Commenter
-0108	Anonymous Commenter
-0109	Anonymous Commenter
-0110	Anonymous Commenter
-0111	Anonymous Commenter
-0112	Public Hearing Statements
-0113	Public Hearing Statements
-0114	Sevier Citizens for Clean Air and Water (SCCAW) Hearing Statement
-0115	Anonymous Commenter
-0116	Anonymous Commenter
-0117	Anonymous Commenter
-0118	Early Mass Mailer Sample - Sierra Club
-0119	Anonymous Commenter
-0120	Anonymous Commenter
-0121	Citizen Commenter
-0122	Anonymous Commenter
-0123	Citizen Commenter
-0124	Retired National Park Service Manager
-0125	Anonymous Commenter
-0126	Anonymous Commenter
-0127	Anonymous Commenter
-0128	Citizen Commenter
-0129	Citizen Commenter (repeat of -0121)
-0130	Utah Citizens Advocating Renewable Energy (UCARE)
-0131	Citizen Commenter
-0132	Citizen Commenter
-0133	No document for this number
-0134	Anonymous Commenter
-0135	Anonymous Commenter
-0136	Utah Physicians for a Healthy Environment (UPHE)
-0137	Citizen Commenter
-0138	Citizen Commenter
-0139	Citizen Commenter
-0140	Citizen Commenter (repeat of -0139)
-0141	Citizen Commenter
-0142	Citizen Commenter
-0143	Citizen Commenter
-0144	Citizen Commenter (Sierra Club mass mailer, comment submitted via Regs.gov)

-0145	Citizen Commenter
-0146	Anonymous Commenter
-0147	Citizen Commenter
-0148	Citizen Commenter (Sierra Club mass mailer, comment submitted via Regs.gov, repeat of -0144)
-0149	Anonymous Commenter
-0150	Citizen Commenter
-0151	Anonymous Commenter
-0152	Carbon County Board of Commissioners
-0153	NPS Regional Director
-0154	National Park Service (NPS)
-0155	Edison Electric Institute
-0156	Colorado Conservation Organizations
-0157	Conservation Organizations, Vicki Stamper Report
-0158	Conservation Organizations, Dr. Gray Report
-0159	Utah Division of Public Utilities
-0160	Utah Department of Air Quality (UDAQ)
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-0163	Utah Associated Municipal Power Systems (UAMPS)
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-0166	Utah Citizens Advocating Renewable Energy (UCARE)
-0167	Conservation Organizations Cover Letter and Exhibits (Conserv Orgs)
-0168	Utility Air Regulatory Group (UARG)
-0169	PacifiCorp, corrected
-0170	Sierra Club, early comments
-0171	Citizen Commenter
-0172	Utah Physicians for Healthy Environment (UPHE) Part 1
-0173	UPHE, Part 2
-0174	Mass Mailer, Distinct Submissions, Sierra Club
-0175	Protect our Winters (POW)
-0176	Colorado Organizations
-0177	Mass Mailer, Industry
-0178	Mass Mailer, Coal Company Employees
-0179	UCARE, Second Submittal

Notes: *This response-to-comment (RTC) document contains EPA's responses to comments received by the close of the public comment period for this action, March 14, 2016.*[1] *Above is the index of the comments that we received within the comment period. The page numbers referenced for each comment refer to the original page number in the comment documents (these are presented in either pdf or document page formatting). In most cases, the footnotes and text of the comments are presented verbatim from the original comment document (including typographical errors, figure numbering, etc.). In some cases, EPA has paraphrased the comments.*

1. Legal Issues

a. EPA Authority and State Discretion

Comment: [UDAQ, pp. 5-6] Utah urges EPA to approve its BART [best available retrofit technology] Alternative because it meets all of the current requirements of the CAA [Clean Air Act] and the RHR [Regional Haze Rule] found at 40 CFR 51.300 through 309. EPA is obligated to approve a SIP [State Implementation Plan] that meets all of the applicable requirements of the CAA. See 42 U.S.C. § 7410(k)(3) (emphasis added) ("In the case of any submittal on which the Administrator is required to act under paragraph (2), the Administrator shall approve such submittal as a whole if it meets all of the applicable requirements of this chapter."). Section 308 grants the states full discretion as to whether to adopt the BART alternative. In the current proposed rule, EPA also acknowledges a state's discretion in approving alternative measures:

> Finally, in . . . responding to concerns regarding "impermissibly vague" language in § 51.308(e)(3) that would allow a State to "appr ove alternative measure that are less protective than BART," we explained that " [t]he State's discretion in this area is subject to the condition that it must be reasonably exercised and that its decision be supported by adequate documentation of its analyses."

81 Fed. Reg. at 2012 (quoting 71 Fed. Reg. 60,612-01, 60,621 (Oct. 13, 2006). Therefore, the alternative measure is within the state's discretion, as long as it is adequately supported.

Response: The response to this comment is provided in the FRN.

Comment: [UDAQ, pp. 5-6 and UDAQ, pp. 5, 6, 8] Utah brings to EPA's attention that EPA mistakenly imposes additional inapplicable requirements in its evaluation of Utah's RH SIP.

Greater reasonable progress under Section 308(e)(2)can be demonstrated using either one of the two methods: (1) "greater emission reductions"than under BART (Section 308(e)(3)); or (2) the "weight-of-evidence test," consisting of anumber of requirements that the state weighs

[1] We received two additional sets of comments after the close of the public comment period, dated May 16, 2016 and May 19, 2016, approximately 13 and 10 business days, respectively, before the final action was taken, and approximately 46 and 49 business days, respectively, after the close of the comment period. Because we received these comments after the close of the comment period, we did not rely on them in taking our final action and do not respond to them here. *See St. Marys Cement Inc. v. U.S. EPA*, 782 F.3d 280, 286-87 (6th Cir. 2015).

to conclude which option achieves greater reasonable progress (Section 308(e)(2)). *See* 40 C.F.R. § 51.308(e)(2) and (3). The state has discretion to choose one method over the other. *See WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 935-37 (10th Cir. 2014). The Tenth Circuit characterized the former approach as "quantitative" and the latter as "qualitative," ultimately ruling that EPA can properly rely on qualitative factors in applying the "weight-of-evidence test." *See id.* at 934-35 (EPA's choice of qualitative standard was "permissible under the EPA's interpretation of its regulations.").

Utah submitted its BART Alternative under Section 308(e)(2), purposefully electing to make its determination that the alternative program achieves greater reasonable progress under the "weight-of-evidence" test. EPA analyzed Utah's BART Alternative in both co-proposals under the Section 308(e)(3) "greater emissions reductions test" in addition to the "weight-of-evidence" analysis. See 81 Fed. Reg. at 2021, 2028. EPA proposed that Utah's BART Alternative does not result in greater emission reductions because "the total NO_x [nitrogen oxides] emission are greater under the BART Alternative than the BART Benchmark," even though "in the aggregate there are fewer SO_2 [sulfur dioxide] and PM_{10} [particulate matter with an aerodynamic diameter of less than 10 micrometers] emissions for the BART Alternative . . . ." *Id.* at 2028. EPA erroneously imposed Section 308(e)(3) requirements on Utah's BART Alternative in addition to the Section 308(e)(2) weight-of-evidence test. EPA must withdraw its analysis of Utah's BART Alternative under the greater emissions reductions test because, as Utah clearly explained, the state never intended its data to satisfy this test.

Response: The response to this comment is provided in the FRN.

Comment: [UDAQ-HT, p. 21] The precedent established by imposition of a [Federal Implementation Plan] FIP after the controls required in the SIP were installed would prove injurious to current and future SIP development process. Based on this action, no SIP-affected source would ever begin design or installation of any SIP-required control measure until after the SIP is fully approved by EPA.

Response: As explained elsewhere, our partial disapproval is consistent with the CAA, the Regional Haze Rule (RHR), and relevant case law. States take the lead in developing SIPs, which EPA then reviews to determine whether they meets the applicable requirements. Therefore, if a source elects to install controls prior to EPA's approval, they do so at their own risk, knowing full well that EPA's review of the SIP is not limited to a ministerial review of the State's decisions, and that if EPA determines the SIP does not meet the requirements, the CAA grants EPA authority to impose a Federal plan to fill the gaps.

Furthermore, as we explained elsewhere, we reasonably considered the combustion controls installed pursuant to the State's BART determinations. For one, consistent with the BART Guidelines, we did not require replacement of or upgrade to those controls. Our ultimate BART determination, selective catalytic reduction with low-NO_x burners and separated overfire air (SCR + LNB/SOFA), uses SCR in tandem with the existing LNB/SOFA. Thus, even accepting the commenter's premise (which we do not) that a hypothetical injury of the type asserted by the commenter is relevant, no such injury exists here.

Comment: [EE, p. 5] Utah proposed SIP revisions that included an alternative measure to BART for regional haze in accordance with 40 C.F.R. 51.308(e)(2), which will be referred to as the BART Alternative. That section of the regulation makes clear that it is fully within a state's discretion whether to adopt a BART Alternative: "A State may opt to implement or require participation in another alternative measure rather than require sources subject to BART to install, operate, and maintain BART."

Response: We agree in part with this comment. As explained elsewhere, we agree that the regional haze regulations provide states with the *option* to adopt alternative BART measures in lieu of BART; however, that is not the only requirement and the state's discretion to adopt an alternative program in lieu of BART is subject to the condition that it be reasonably exercised and adequately supported.

Comment: [PacifiCorp, p. 60] PacifiCorp requested EPA incorporate by reference its prior December 22, 2014 comment letter addressed to the State of Utah into PacifiCorp's current March 14, 2016 comments to EPA *[corrected version of the 2014 letter submitted to EPA is undated]*. These prior comments include the overarching comment that Utah properly established an "other alternative measure" for NO_x instead of establishing NO_x BART for each of the Units. PacifiCorp provided the following supporting information:

40 C.F.R. 51.308(e)(2) allows a state to implement an "other alternative measure" ("Alternative Measure") in lieu of BART so long as the Alternative Measure meets certain regulatory requirements and can be demonstrated to "achieve greater reasonable progress than would be achieved through the installation and operation of BART." Greater reasonable progress can be demonstrated using one of two methods: (i) "greater emission reductions" than under BART (40 C.F.R. §51.308(e)(3)); or (ii) "based on the clear weight-of-evidence" (40 C.F.R. §51.308(e)(2)(E)). As the U.S. Circuit Court of Appeals for the 10th Circuit recently observed, the state is free to choose one method or the other. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 935-37 (10th Cir. 2014). The court characterized the former approach as a "quantitative" and the later as "qualitative," and specifically sanctioned the use of qualitative factors under the clear weight-of-evidence.

In the SIP Revision, Utah properly demonstrated compliance with each of the identified regulatory requirements for establishing an "other alternative measure" as explained below [*we have located PacifiCorp's significant 2014 comments on each aspect of the better-than-BART demonstration to the appropriate section below for each element*]. In the process, Utah also demonstrated greater reasonable progress by applying the qualitative (i.e., clear weight-of-evidence) approach.

Response: We agree in part and disagree in part with this comment. We agree that EPA's Regional Haze regulations provide for two methods to demonstrate that a BART Alternative meets the regulatory requirements, and that Utah selected to "qualitative" approach. We do not agree that Utah's demonstration showed that its Alternative achieves greater reasonable progress, as is discussed elsewhere in this document and the FRN.

Comment: [PacifiCorp, transcript p. 25] The proposed FIP is not legally sustainable. The state of Utah completed a rigorous public process to develop its regional haze SIP in accordance with EPA's rules. Given the flexibility provided under those rules for states to develop and implement their own Regional Haze programs, the very fact that EPA developed an analyses and rationale that supports Utah's SIP is reason enough to accept it as written.

Response: The response to this comment is provided in the FRN.

Comment: [Carbon County, p. 2] We strongly believe that the best and most accurate data to make determinations from is that which is done locally by UDAQ. This agency is well sourced and funded to make determinations and set guidelines based on that data. EPA has stated that its actions are based on the data monitored, collected, and interpreted by the UDAQ. In recent years many of EPA's actions have been found to be driven more by the political expediency. We strongly feel decisions affecting the health, safety and welfare of our citizens is better left to those who are closer and more affected. Given the data and information on the ground, Carbon County is quite sure that the State is better equipped to monitor, regulate and adjudicate the impacts to air quality in Utah.

Response: We disagree with this comment. As explained elsewhere in this document and the FRN, we cannot approve the portions of the State's regional haze submittal that do not meet the CAA and RHR requirements. When, as here, such requirements are not met, the CAA requires EPA to promulgate a FIP to address these requirements, and we are doing so in today's action.

Comment: [PacifiCorp, pp. 5, 56] EPA is not empowered under the CAA to require compliance with both the SIP Proposal and the FIP Proposal. As a practical matter, that is precisely what EPA proposes to do to the extent it approves the FIP Proposal. This is because PacifiCorp already has implemented the SIP Proposal as required by Utah law. If EPA were to select the FIP Proposal, it would do so knowing[2] that PacifiCorp would be required to implement both the SIP Proposal and the FIP Proposal. Nothing in CAA or regional haze rules allows EPA to require such a result when the Proposed Action itself states that EPA it "intends to finalize only one proposal." See 81 FR at 2006.

For all of the reasons stated above, EPA should approve the Utah SIP as stated in the SIP Proposal, and should reject the FIP Proposal. What EPA cannot do, and indeed is not empowered under the CAA to require, is compliance with both the SIP Proposal and the FIP Proposal.

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[2] EPA is well aware that the Utah SIP, as it has been implemented over time, became binding state law in regard to the Utah BART Units and ultimately the other units covered by the BART Alternative. This makes it particularly egregious that, even though EPA knew that PacifiCorp was required to expend hundreds of millions of dollars to fully implement the BART Alternative under state law, EPA said nothing about its intention to issue a competing co-proposal until after PacifiCorp had completed all of the emission reductions required under the Utah SIP. See EPA letter to Utah Division of Air Quality dated May 1, 2015 commenting on the then-proposed Utah SIP including the BART Alternative). This secretive approach by EPA also caught the Utah Division of Air Quality off guard as explained in their oral comments during the January 26, 2016 hearing: "Throughout the SIP development process, we worked as regulatory partners, closely and extensively with EPA staff to ensure that Utah's Alternative to BART SIP revision met all the requirements of the Clean Air Act and was approvable by EPA. The EPA should approve the option that Utah developed while in close consultation with EPA and not the option that Utah was not even aware was being prepared or under consideration until it was proposed in the Federal Register."

Response: The response to this comment is provided in the FRN.

Comment: [PacifiCorp, p. 5] EPA has not provided adequate justification to conduct a new BART analysis for NO_x while simultaneously proposing to conclude that the Utah SIP meets applicable regional haze requirements.

Response: We disagree with this comment. The FRN for today's action and EPA's co-proposal provide the rationale for disapproving portions of the State's SIP. EPA's disapproved earlier Utah's NO_x and PM_{10} BART determinations in December 2012, 77 FR 73455 (Dec. 12, 2012), which triggered the "FIP clock" requirement under CAA Section 110(c) for EPA to promulgate a FIP within two-years, unless the state submitted and EPA approved a SIP submittal within the two year period. The "FIP clock" has already expired for the portions of the Utah Regional Haze Plan that EPA disapproved and EPA was not able to approve the NO_x BART Alternative the State submitted in June 2015. We are thus required to promulgate a FIP for any disapproved potions of the SIP; this action fulfills this duty.

Comment: Several commenters at the public hearing expressed the opinion that since air pollution does not adhere to state boundaries, EPA should be involved in the state of Utah and elsewhere to help put improved technologies in place and reduce emissions.

Response: We appreciate the commenters' support of our finalization of the co-proposal to disapprove the SIP and issue the FIP. We take no position on the other statements in this comment

Comment: [Docket ID -0161] Utah's DAQ & AQB deserve deference. Utah has complied with the 70 recommendations of the Grand Canyon Visibility Transport Commission [GCVTC], including submitting a 309 SIP in 2003, 5 years before agencies complying with 308 provisions. Utah has submitted all the required sulfur dioxide Milestone and Backstop Trading Program reports, has revised the program frequently to accommodate litigation and various members leaving the program. All reports & updates have been submitted in a timely fashion, following final action by Utah's AQB after notice and public comment. This was at very considerable investment in staff time, study by AQB members and meaningful contributions by the public.

Under the provisions of Utah's 309 SIP, additional pollution controls were applied to several units at Hunter & Huntington which reduced PM, SO_2 and NO_x. We reached our 2018 SO_2 reduction target years early, in 2010, and SO_2 has continued to decline. This extensive & extended comment & hearing schedule has served to increase polarization in our state and divert attention from creating solutions to our air quality problems that are effective & politically palatable.

If one is working for attainable solutions, litigation & over-long delay of decisions is not useful. Please approve Utah's June 4 & Oct 20 2015 submissions.

Response: We take no position on the commenter's historical synopsis. For the reasons explained elsewhere, we disagree with the commenter's suggestion that we should defer to the State and approve the SIP submissions.

Comment: [UARG, p. 5] To the extent EPA makes significant changes to its proposed actions, EPA should issue a new proposed rule before taking final action on regional haze requirements for the Hunter and Huntington plants.

Response: EPA is not proposing significant changes to our co-proposed action and therefore we are taking final action today.

Comment: [UARG, pp. 19-20] Utah reasonably concluded, based on the weight of the evidence before it and the results of the majority of the metrics it assessed, that the BART Alternative outperforms the BART Benchmark. Utah has discretion to weigh this evidence itself, Utah did so appropriately and in a rational way, and EPA cannot second-guess the state's reasoned analysis.

Response: For the reasons explained elsewhere in this RTC document and the FRN, we disagree with the commenter's suggestion that all the State's conclusions were reasonable and that EPA lacks authority to evaluate the State's analysis. As we explain elsewhere, we have the duty to ensure that regional haze SIP submittals meet the requirements of the Act and the RHR.

Comment: [Transcript pp. 53-54] Several commenters noted that EPA has overstepped its authority in proposing a FIP that was not fully reviewed or even provided to the state air quality division. Further the commenters think, as a result, that the FIP is not legally sustainable. One commenter noted that this was going to further the efforts of the congressional oversight committee to continually look at defunding part of the EPA.

Response: As explained elsewhere, we disagree with the commenters suggestions that we do not have authority to promulgate a FIP. Additionally, the proposed FIP was included in the co-proposal notice and the State had an opportunity to review and provide comments, which they did. We take no position with regard to future efforts.

Comment: [UARG, pp. 17-18] EPA also evaluates Utah's assessment of the adequacy of its BART Alternative's emission reductions when the Agency reviews the state's weight-of-evidence assessment in the section of the Proposed Rule that describes the proposed disapproval of the BART Alternative. 81 Fed. Reg. at 2028-32. As discussed above, despite EPA's statement that the weight-of-evidence approach is the appropriate approach to use for evaluating a BART alternative that produces greater emission reductions than a BART benchmark with respect to some pollutants but fewer reductions with respect to other pollutants, EPA begins its discussion of Utah's weight-of-evidence analysis by stating that

> visibility modeling is the most appropriate method to assess the overall improvements in visibility impacts from control scenarios where reductions of multiple pollutants are considered, except where every visibility impairing pollutant is reduced by a greater amount under the alternative.

Id. at 2029 (footnote omitted). Although visibility dispersion modeling can be required under 40 C.F.R. § 51.308(e)(3) if the distribution of emissions would differ significantly under an alternative as compared to BART, the weight-of-evidence approach *may* involve such modeling

but is never *required* to – irrespective of whether (and to what extent) the distribution of emissions differs. 40 C.F.R. § 51.308(e)(2)(i), (e)(2)(i)(E).

But in this part of the Proposed Rule, EPA goes even further in improperly rejecting Utah's analyses and substituting its own judgments for those of the state than it does in the proposed approval section of the Proposed Rule, which, as described above, also is flawed by EPA's improper rejection or discounting of certain state decisions. EPA notes that Utah determined that all of the metrics it evaluated, except the 98th percentile dv impacts, support a determination that the BART Alternative is better than BART. 81 Fed. Reg. at 2029. In its proposed disapproval, however, EPA fails to grant any deference to Utah's reasonable determinations and improperly discounts *all* of the metrics that Utah determined support the BART Alternative.

Response: The response to this comment is provided in the FRN.

Comment: [UARG, p. 19] Moreover, EPA's proposed disapproval of the BART Alternative under the weight-of-evidence test does not give appropriate deference to Utah's assignment of weight to the timing of emission reductions, which EPA acknowledges occur much earlier under the BART Alternative than under the BART Benchmark. *Id.* EPA likewise fails to account fully for the importance of SO_2 emissions in influencing visibility conditions in the Class I areas affected by emissions from the facilities subject to the BART Alternative, and the importance of park-visitation seasonality, energy and non-air quality benefits, and costs. *See id.* at 2031. For the reasons described above, EPA has no basis for rejecting or discounting these considerations.

Response: The response to this comment is provided in the FRN and elsewhere in this RTC document.

b. Compliance with Section 307(d)

Comment: [UARG, p. 22] Judging from this language in the Proposed Rule, the nature and scope of potential changes to the BART Alternative that EPA suggests it may consider promulgating in this rulemaking are unclear and undefined. Utah developed the BART Alternative with input from the owner and operator of the facilities that are subject to the Alternative. Any significant changes to the BART Alternative could upset carefully balanced decisions underlying the Alternative that Utah adopted and submitted to EPA. For that reason, and to satisfy requirements of reasoned decision-making and section 307(d) of the Act, should EPA decide to make, and to incorporate into a FIP, significant changes to Utah's BART Alternative, the Agency should first issue a new proposed rule or a supplemental notice of proposed rulemaking and allow for, consider, and respond to public comments on any revised proposed BART Alternative.

Response: The commenter suggests that if EPA were to incorporate into a FIP significant changes to Utah's BART Alternative, EPA should first provide for public notice of those changes. EPA's final action includes partially approving and partially disapproving the Utah SIP, and then promulgating a FIP to fill the disapproval gaps. Our final FIP does not incorporate changes to Utah's BART Alternative, but is rather based on source-specific BART determinations for the State's four subject-to-BART sources. EPA's proposed FIP was based on

the same BART determinations; therefore, there was no need to issue a new proposed rule or a supplemental notice of proposed rulemaking to satisfy CAA section 307(d).

c. Compliance with Section 169A(d)

Comment: [NPS, p. 4] UDAQ did not provide the Federal Land Managers an opportunity to consult on the revision nor provide notice of availability for public comment as required by regulation. We are now relying on EPA to act to protect visibility in these iconic national parks.

Response: The EPA disagrees that UDAQ did not provide notice of availability for public comment as required by regulation. On September 23, 2014, UDAQ sent preliminary draft SIP documents via email to the Forest Service and National Parks Service notifying them of the public hearing on December 1, 2014; and therefore the FLMs received 68 days' notice in compliance with 40 CFR §51.308(i)(2), which requires the FLMs to receive at least 60 days' notice. Copies of the email correspondence documenting this effort are included in the rule docket.

Additionally, we are aware that the State did not provide notice to the FLMs of the State's proposed enforceable commitment SIP. However, as explained elsewhere, we are not taking final action on the enforceable commitment SIP so we do not address this comment with respect to that submittal.

Comment: [NPS Tech, p. 41] UDAQ failed to provide the 60-days (prior to the 12/1/2014 public hearing) required for us to evaluate critical information provided on 11/25/2014 and, as a result, NPS was unable to complete and make public its assessment of impairment of visibility in the mandatory Class I Federal areas affected by the proposal. EPA is incorrect in asserting that, "The State provided the opportunity for the FLMs to review the preliminary draft SIP documents via email approximately 68 days prior to the public hearing that was held on a December 1, 2014." While we were provided some of the draft SIP documents on 9/23/2014, we did not receive the critical "additional CALPUFF modeling to supplement the modeling completed by PacifiCorp in 2012. A summary of the results and the modeling protocol have been posted as part of the technical support documentation for the proposal…" until six days before the public hearing. Partial consultation via incomplete information does not fulfill UDAQ's obligation to provide the "Assessment of impairment of visibility in any mandatory Class I Federal area…" required by the regulation.

EPA notes that, "The October 2015 Utah RH SIP was provided for public comment August 15 through September 14, 2015, and we are not aware of any prior FLM consultation on this SIP. The FLMs did not submit comments during this public comment period." NPS did not submit comments because we were not notified until we received an email from EPA on 9/6/2015 advising that. "There is another public comment period which closes on 9/14/15..." UDAQ's failure to provide notice to the FLM of the August 15 through September 14, 2015 public comment period is another example of its failure to meet its consultation requirements.

Response: The EPA partially agrees and disagrees with the commenter regarding the Utah Division of Air Quality did not providing notice to the FLMs of the public hearing on December

1, 2014. On September 23, 2014, UDAQ sent preliminary draft SIP documents via email to the Forest Service and National Parks Service notifying them of the public hearing on December 1, 2014; and therefore the FLMs received 68 days' notice in compliance with 40 CFR §51.308(i)(2). However, we acknowledge that not all of the information that the State relied on in proposing the rule was made available to the FLM and NPS. Copies of the email correspondence documenting this effort are included in the rule docket. The EPA agrees with the commenter that the UDAQ did not provide the Federal Land Managers (FLMs) notice of the August 15, 2015 through September 14, 2015 comment period, because we did not find any documentation in the SIP submittal that the FLMs received notice of this particular comment period.

Comment: [NPS-TC, p. 1] UDAQ did not comply with the procedural requirements of the Regional Haze Rule (RHR) with respect to provision of sufficient notification and information to the Federal Land Manager (FLM) prior to the December 1, 2014 public hearing, and the August 15 through September 14, 2015 public comment period.

Response: The EPA agrees in part and disagrees in part with the commenter. The EPA agrees with the commenter that the Utah Division of Air Quality did not provide the Federal Land Managers (FLMs) notice of the August 15, 2015 through September 14, 2015 comment period, because we did not find any documentation in the SIP submittal that the FLMs received notice of this particular comment period. The EPA partially agrees and disagrees with the commenter regarding the Utah Division of Air Quality did not providing notice to the FLMs of the public hearing on December 1, 2014. On September 23, 2014, UDAQ sent preliminary draft SIP documents via email to the Forest Service and National Parks Service notifying them of the public hearing on December 1, 2014; and therefore the FLMs received 68 days' notice in compliance with 40 CFR §51.308(i)(2). However, we acknowledge that not all of the information that the State relied on in proposing the rule was made available to the FLM and NPS.

d. Public Hearing

Comment: [Transcript pp. 125-126] One commenter discussed what they claimed was a deficient process that the Utah Municipal Power Agency uses to inform residents about changes. There are thousands of energy users in the Utah Valley who buy power through UMPA and have virtually no say in how that money is spent or the kind of policy decisions that are made. Public outreach does not happen. There were only two attendees at the January 26th hearing from Provo and the commenter requested an additional hearing be held in Provo especially for the UMPA power users.

Response: The CAA and EPA regulations do not require EPA to specifically consider the notice provided by the UMPA to its customers as part of its evaluation of a state's SIP. Therefore, the EPA does not address whether more hearings are necessary. There is no issue presented in this comment that affects the EPA's assessment of the rulemaking.

4 Comments: [Docket ID -0107], [Docket ID -0045], [Docket ID -0099] & [Transcript p. 79] Several commenters expressed concern over the accommodations provided at the public hearing.

They on the large number of attendees, and how this made it difficult for them to make their comments, as well as to hear those who were commenting. Commenters noted that many attendees were intimidated by the size of the hearing and by some of the other attendees, and suggest that many of these attendees left the hearing without commenting on the issues. There is concern that these departures may have led to an imbalance in opinions presented. Some commenters noted that some of the attendees at the hearing were not being cordial with the others and unkind to those who expressed different opinions. Several commenters made requests for an additional hearings, with some being located closer to the affected Class I areas at locations that can accommodate a larger number of attendees.

Response: The response to this comment is provided in the FRN.

2 Comments: [Transcript pp. 29-30] Several commenters asserted that the public hearing was held in Salt Lake City with the ulterior motive of trying to make people believe that the haze in the city is the result of the Hunter and Huntington power plants. Some commenters suggested that this caused several of the hearing attendees to attribute the haze in Salt Lake City to the power plants at issue in this proposal. The commenters noted that the power plants do not cause the haze in the Salt Lake City metropolitan area.

Response: The EPA agrees in part and disagrees in part with the commenters. The EPA's purpose in making the public hearing arrangements was to give interested persons an opportunity to comment on the proposed SIPs, which include a BART alternative, and the proposed FIP which would require the installation of BART controls at the Hunter and Huntington power plants. In the end, the purpose of the hearing was achieved, and those who stayed and wished to comment were able to do so. In the notice of proposed rulemaking, 81 FR 2004, EPA makes it clear that the purpose of this rulemaking is to reduce haze and visibility impairment at Class I areas near the plants, specifically stating that emissions from the two plants "contribute to visibility impairment at nine Class I areas including Grand Canyon, Arches, Bryce Canyon and Zion National Parks." While some of the hearing attendees suggested the haze in Salt Lake City was from the power plants at issue, the EPA made no suggestions in either the proposed notice or at the hearing that the haze in Salt Lake City was caused by those power plants. The Salt Lake City library was chosen as the public hearing site for the reasons explained in the FRN.

Comment: [Docket ID -0046] I arrived at the Salt Lake City, UT, meeting at 2:30 PM today. It was very apparent that the fossil fuel industry had stacked the meeting with employees of many types, including extractors of fuels, mostly coal. They were provided with industry signage promulgating lies about the benefits of fossil fuels, some of which clearly indicated fossil fuel use is "good for the planet" and "good for people". Included also was signage indicating beneficial products found in our homes derived from fossil fuels. The speaker we overheard in a very crowed area, mostly filled with industry people, were that Utah has done a good job in keeping the air clean, and that there was no confidence in the EPA proposed rules.

It became obvious, and not surprising for Utah mentality, that the meeting this afternoon was "stacked" in favor of the fossil fuel industries. The signage displayed was provided by the industries involved here in Utah. They were standardized, and carried by many people, as well as strategically place for all to see.

I seriously doubt that any speaker voicing concerns to the contrary of the industry will be well received considering many in attendance were miners with their families.

Response: Comment noted.

e. RHR and BART Guidelines

Comment: [UDAQ, p. 17] EPA's proposal to partially approve and partially disapprove Utah's RH SIP revisions is based on an analysis that accounts for current conditions. This results in inaccurate cost effectiveness estimates for the installation of BART controls. Utah's RH SIP was originally submitted in 2003, as required by Section 309 at that time, leading to the reductions of emissions and installation of controls between 2003 and 2008 that should also be considered. This is the standard Utah was under and it should not be penalized for complying with Section 309 and achieving early reductions that have provided visibility benefits for the last decade.

Response: EPA evaluated the emission reductions available under the State's NO_x BART Alternative in a manner consistent with the Regional Haze Rule's requirements. As explained elsewhere in responding to similar concerns on "existing controls", we disagree with the commenter that we have not taken existing controls into consideration.

Comment: [UAMPS, p. 2] UAMPS contends EPA's proposed partial disapproval of the revised SIP and issuance of a FIP is arbitrary, capricious, and contrary to the Clean Air Act ("CAA") and applicable regulations and guidelines under the federal regional haze program.

Response: As explained elsewhere, our partial disapproval is consistent with the CAA, the Regional Haze Rule, and relevant case law.

f. Reasonableness Standard

Comment: [PacifiCorp, pp. 2, 6, 9] EPA arbitrarily and capriciously applies two inappropriate standards to the Utah SIP Proposal. In an attempt to replace Utah's determination with its own, EPA imposes a "Reasonableness Standard" without concluding the Utah SIP Proposal contains data or methodological flaws – the limited circumstances under which courts have upheld use of this standard – and also imposes a "Complexity of Evaluation" standard which finds no support in the CAA or applicable regulations.

Inapplicable Regional Haze Requirements. EPA is prohibited from imposing additional requirements upon its approval/disapproval of a SIP that do not qualify as "applicable requirements."

EPA is not correct in its attempt in the Proposed Action to impose additional requirements on its evaluation of the BART Alternative and Utah SIP that are different than that Applicable BART Alternative Requirements.

1. Reasonableness Standard –EPA asserts that Utah "has several options for making the greater reasonable progress determination [and it] elected to use two separate approaches."[3] See 81 FR at 2006. EPA further states that it will evaluate both of those approaches in deciding whether to approve the Utah SIP. EPA then makes the blanket assertion that "the State's discretion in this area is subject to the condition that it must be reasonably exercised and that its decisions be supported by adequate documentation of its analysis." ("Reasonableness Standard.") See 81 FR at 2006. Although the use of words like "reasonable" and "adequate" have common sense appeal in the abstract, EPA may not apply this standard in a way that allows EPA to discard the state's discretion and instead impose EPA's own will. (See generally Paragraphs (2) and (3) of PacifiCorp's written comments dated August 26, 2013 as submitted in EPA Docket ID No. EPA-R08-OAR-2012-0026 and identified in that docket as ID. No. EPA-R08-OAR-2012-0026-0149; a portion of these comments is attached hereto as Attachment 2.)

In addition, the present circumstances regarding the SIP Proposal are far different than those circumstances in which courts have upheld EPA's use of a similar Reasonableness Standard in other regional haze settings. For example, in North Dakota v. EPA, 730 F.3d 750, 760 (8th Cir. 2013), the court allowed EPA's use of the Reasonableness Standard under those circumstances where the state's BART determination contained "data flaws that led to an overestimated costs of compliance." Also, Oklahoma v. EPA, 723 F. 3d 1201, 1212 (10th Cir. 2013) reached a similar conclusion based on "methodological flaws."

In the case of the SIP Proposal, however, EPA proposes to approve the BART Alternative based on compliance with the Applicable BART Alternative Requirements[4] and without also concluding that the BART Alternative contains "data flaws" or "methodological flaws." Therefore, the factual bases for allowing EPA to apply a Reasonableness Standard do not exist in regard to the BART Alternative and EPA should not attempt to apply such a standard here – particularly as a basis for rejecting the BART Alternative.[5]

2. Complexity of Evaluation Standard - EPA also is wrong in its attempt to count among applicable requirements the unsupported conclusion that the "complexity of our evaluation" somehow necessitates EPA soliciting comments not only on the SIP Proposal, but also on the competing FIP Proposal. See 81 FR 2006.[6] Even taking at face value the assertion that analyzing

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[3] As explained below, EPA is simply wrong in concluding that Utah used two separate approaches to demonstrate greater reasonable progress. Therefore, EPA's stated basis for imposing the Reasonableness Standard does not support EPA's effort to do so.

[4] *See* generally 81 FR 2021–2026 (Jan. 14, 2016).

[5] This is not to say that EPA lacks any role in reviewing and approving the Utah SIP. Indeed, the latest court to weigh in on EPA's review authority makes clear that "Congress intended that EPA, not the states alone, ultimately ensure that state determinations as to regional haze comply with the [Clean Air] Act…." Arizona ex rel. Darwin v. EPA, No. 13-70366, slip op. at 19-20 (9th Cir. Feb. 4, 2016). Although PacifiCorp agrees that EPA has a role to play in making sure the Utah SIP complies with the CAA and applicable requirements, it also notes that EPA must do so in a way that does not undermine the role of states like Utah to which "Section 169A [of the CAA] gives…substantial responsibility in determining appropriate BART [and BART Alternative] controls." The court goes on to make clear that "EPA may not disapprove reasonable state determinations that comply with the relevant statutory and regulatory requirements." *Id.* at 22. Such is the case with the Utah SIP.

[6] EPA attempts to further support this contrived "complexity" requirement by repeatedly stating that such a requirement exists, as if repetition alone somehow can bring an imaginary requirement into existence (i.e., "In light

the Utah SIP is "complicated", that alone does not require EPA to evaluate the Utah SIP differently than any other regional haze SIP, nor does it justify EPA in presenting dueling co-proposals.[7] In other words, EPA has simply conjured up this new "complexity" requirement[8] out of thin air in an attempt to support its offering of the competing FIP Proposal. EPA is acting arbitrarily and without legal authority by seeking comment on the FIP Proposal based on what EPA calls the "complexity of our evaluation" and for this reason EPA should withdraw the FIP Proposal and approve the SIP Proposal as proposed.

Response: The response to this comment is provided in the FRN.

g. Compliance with 40 CFR 51.308

Comment: [UDAQ-HT, p. 22] The EPA's proposal to partially disapprove the Regional Haze SIP is based on an analysis that accounts for conditions as they are currently. This is inconsistent with the Regional Haze Rule which requires all options to be evaluated from the beginning of the current planning period. This is the standard that was required for Utah. We request EPA adhere to the same standard.

Response: EPA evaluated the emission reductions available under the State's NO_x BART Alternative in a manner consistent with the Regional Haze Rule's requirements. To the extent that the commenter is concerned with our treatment of the LNB/SOFA that were installed pursuant to the State's NO_x BART determinations, as explained elsewhere in responding to similar concerns on "existing controls", we disagree with the commenter that we have not taken existing controls into consideration.

Comment: [UDAQ, p. 24] EPA's FIP proposal is unnecessary because EPA already found Utah is making the required "reasonable progress." The goal of the RH program is to make "reasonable progress" towards the statute's national visibility goal. Accordingly, EPA promulgated regulations "to assure . . . reasonable progress toward meeting" the national visibility goal, § 7491(b)(2), and mandated that EPA's regulations contain "such emission limits,

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of the variety of metrics Utah used, this is a complicated analysis…;" "The complexity of our evaluation leads us to propose and solicit comments on two conclusions and two courses of action…;" "Given the complexities in evaluating these co-proposals, EPA wants to ensure that our final decision is based on the best and most currently available data and information, and is taken with the fullest possible consideration of public input.") See 81 FR at 2006.

[7] The Tenth Circuit Court of Appeals, which considered whether EPA's approval of a BART Alternative for SO2 emissions was appropriate, did not conclude that EPA's analysis of the alternative program was, by its nature, more complicated than a BART analysis. See generally WildEarth Guardians v. EPA, 770 F.3d 919 (10th Cir. 2014).

[8] EPA further attempts to justify its rationale for considering the FIP Proposal by asserting, as explained in footnote 3, the need to "ensure that our final decision is based on the best and most currently available data and information, and is taken with the fullest possible consideration of public input." EPA already is charged with ensuring that any final decision is based on the best current data and information available. See Final Rule, Regional Haze Regulations; Revisions to Provisions Governing Alternative Source-Specific BART Determinations, 71 Fed. Reg. 60612, 60622 (Oct. 13, 2006); see also, 5 U.S.C. § 706(2). EPA already is required to make a decision based on the fullest possible consideration of public input. See 5 U.S.C. §553(c). Re-stating these fundamental principles does not allow EPA to bootstrap itself into also considering a competing coproposal (the FIP Proposal) when the SIP Proposal already meets all Applicable BART Alternative Requirements as EPA itself has proposed to conclude. Arizona ex rel. Darwin v. EPA, No. 13-70366, slip op. at 22 (9th Cir. Feb. 4, 2016) (stating that "EPA may not second-guess reasoned, legally compliant state decisions.") (internal citations and quotations omitted).

schedules of compliance and other measures as may be necessary" to assure such progress towards meeting that goal, "including" a requirement that states make BART determinations. Id. (emphasis added). As EPA has stated, "BART is one component of long term strategies to make reasonable progress." Regional Haze Regulations and Guidelines, 70 Fed. Reg. at 39,137.

Because BART's purpose is to make reasonable progress, EPA adopted regulations exempting states from making BART determinations if they can show that other measures for large stationary sources will achieve greater reasonable progress. 40 C.F.R. § 51.308(e)(2) (2012). EPA defended those regulations in court by arguing that BART is one of a number of "emission limits, schedules of compliance and other measures" that "must" be included in a SIP "'as may be necessary to make reasonable progress toward national visibility goals.'" *Ctr. for Energy and Econ. Dev. v. EPA*, 398 F.3d 653, 659-60 (D.C. Cir. 2005) (confirming BART is but one measure for achieving "reasonable progress"); *Cent. Arizona Water Conservation Dist. v. EPA*, 990 F.2d 1531, 1534 (9th Cir. 1993) (same). If an alternative can better achieve those goals, EPA has stated that BART would not be "necessary to make reasonable progress." *Id.* The court agreed with EPA's analysis, although it overturned EPA on other grounds. *Id.* As the court said, "the focus of the Clean Air Act was to achieve 'actual progress and improvement in visibility,' 42 U.S.C. § 7492(b), not to anoint BART the mandatory vehicle of choice." *Id.* at 660.

As EPA recognizes, in some circumstances no BART controls may be necessary to make reasonable progress. It follows that in other circumstances, depending on a state's reasonable-progress goals and expected non-BART emission reductions, BART controls of varying stringency may be necessary. Consistent with this goal, EPA has approved Utah's "reasonable progress" determination for its RH SIP in its entirety. *See* "Approval, Disapproval and Promulgation of State Implementation Plans; State of Utah; Regional Haze Rule Requirements for Mandatory Class I Areas Under 40 CFR 51.309," published at 77 Fed. Reg. 74,355, 74,367-68 (Dec. 14, 2012). EPA found that "the State met all reasonable progress requirements for the Class I areas," including by implication any required NO_x BART limits. In fact, EPA stated that Utah's 2008 RH SIP, including BART controls identified in that 2008 RH SIP, would result in "a significant decrease in stationary source NO_x and SO_2 emissions." *Id.* EPA further found that the NO_x BART controls adopted by Utah for the Hunter and Huntington EGUs at issue would decrease NO_x emissions by "6,200 tons [annually] between 2002 and 2018." *Id.* Therefore, EPA acknowledged that Utah's NO_x BART limits and controls are all that are required to achieve "reasonable progress," and no further NO_x BART requirements should be imposed by EPA through its FIP Proposal.

Response: The response to this comment is provided in the FRN.

Comment: [PacifiCorp p. 52] EPA's FIP Proposal is Unnecessary Because EPA Already Found Utah is Making the Required "Reasonable Progress": States and EPA do not make BART determinations in a vacuum but within a framework carefully crafted to make "reasonable progress" towards the statute's national visibility goal. As part of that framework, Congress directed EPA to promulgate regulations "to assure . . . reasonable progress toward meeting" the national visibility goal, § 7491(b)(2), and mandated that EPA's regulations contain "such emission limits, schedules of compliance and other measures as may be necessary" to assure such progress towards meeting that goal, "including" a requirement that states make BART

determinations. Id. (emphasis added). As EPA has stated, "BART is one component of long term strategies to make reasonable progress." Regional Haze Regulations and Guidelines, 70 FR at 39137.

Indeed, precisely because BART's purpose is to make reasonable progress, EPA adopted regulations exempting states from making BART determinations at all if they can show that other measures for large stationary sources, such as a cap- and-trade program, will achieve greater reasonable progress. 40 C.F.R. § 51.308(e)(2) (2012). EPA defended those regulations in court by arguing that BART is one of a number of "emission limits, schedules of compliance and other measures" that "must" be included in a SIP "'as may be necessary to make reasonable progress toward national visibility goals.'" Ctr. for Energy and Econ. Dev. v. EPA, 398 F.3d 653, 659-60 (D.C. Cir. 2005) (confirming BART is but one measure for achieving "reasonable progress"); Cent. Arizona Water Conservation Dist. v. EPA, 990 F.2d 1531, 1534 (9th Cir. 1993) (same). According to EPA, if other measures better achieved those goals, then BART would not be "necessary to make reasonable progress." Id. The court agreed with EPA's analysis, although it overturned EPA on other grounds. Id. As the court said, "the focus of the Clean Air Act was to achieve 'actual progress and improvement in visibility,' 42 U.S.C. § 7492(b), not to anoint BART the mandatory vehicle of choice." Id. at 660.

Thus, EPA cannot validly judge a state's BART determination outside of its reasonable progress context. Owasso Indep. Sch. Dist. No. I-011 v. Falvo, 534 U.S. 426, 434 (2002) ("'the words of a statute must be read in their context and with a view to their place in the overall statutory scheme.'"). As EPA recognizes, in some circumstances, no BART controls may be necessary to make reasonable progress. It follows that in other circumstances, depending on a state's reasonable- progress goals and expected non-BART emission reductions, BART controls of varying stringency may be necessary.

Here, EPA already has approved Utah's "reasonable progress" determination for its RH SIP in its entirety. See "Approval, Disapproval and Promulgation of State Implementation Plans; State of Utah; Regional Haze Rule Requirements for Mandatory Class I Areas Under 40 CFR 51.309," published at 77 FR 74355, 74367-68 (Dec. 14, 2012). EPA found that "the State met all reasonable progress requirements for the Class I areas," including by implication any required NO_x BART limits. Id. In fact, EPA stated that Utah's 2008 RH SIP, including BART controls identified in that 2008 RH SIP, would result in "a significant decrease in stationary source NO_x and SO_2 emissions." Id. EPA further found that the NO_x BART controls adopted by Utah for the Hunter and Huntington EGUs at issue would decrease NO_x emissions by "6,200 tons [annually] between 2002 and 2018." Id. Therefore, EPA acknowledged that Utah's NO_x BART limits and controls are all that are required to achieve "reasonable progress," and no further NO_x BART requirements should be imposed by EPA through its FIP Proposal.

Response: The response to this comment is provided in the FRN.

Comment: Utah did not make a BART "determination" for NO_x at the BART-subject units of Units 1 and 2 of the Hunter Power Plant and Units 1 and 2 of the Huntington Power Plant. Utah evaluated the five-factor BART analyses submitted by PacifiCorp in June 2012 and updated by PacifiCorp in 2014 and stated that it "agreed that [selective catalytic reduction] + low NO_x

burners with overfire air with an annual emission rate of 0.05 lb/MMBtu was the most stringent technology available to reduced NO_x emissions" from the BART-subject units in Utah. The state indicated that this combination of selective catalytic reduction (SCR) plus low NO_x burners and overfire air can be used as a "stringent benchmark" for comparison with their BART alternative, but Utah also stated that the technology is very expensive to install on the Utah BART-subject units and "would require careful consideration through a case-by-case 5-factor analysis before determining if it was cost effective." Accordingly, Utah has not met the requirement of 40 C.F.R. §51.308(e)(2)(i)(C) to make a BART determination for Hunter Units 1 and 2 and Huntington Units 1 and 2. This is a required element of any BART alternative. In its concurrent proposal, EPA proposed to find that SCR plus low NO_x burners and overfire air meeting an annual NO_x emission rate of 0.05 lb/MMBtu constitutes NO_x BART for Hunter Units 1 and 2 and Huntington Units 1 and 2, but EPA did not appear to rely on its proposed NO_x BART determination to address this required element for approval of any BART alternative.[9]

Response: We take no position on the commenter's historical synopsis. Because the combination of controls selected as the BART Benchmark are the most stringent NO_x controls available, it was not necessary for Utah to complete each step in the BART analysis.[10]

Comment: [Conserv Orgs, p. 36] The modeling [submitted by the commenters] demonstrates that Utah's BART Alternative not only fails to achieve "greater reasonable progress" than BART, but also that the Alternative would cause visibility to ***decline*** in violation of 40 C.F.R. § 51.308(e)(3)(i).

Response: As the commenters explain in making this comment, the modeling they refer to in this comment is the modeling they submitted, which they suggest they conducted to correct erroneous modeling assumptions upon which Utah relied to reflect realistic future emissions from the Carbon Plant if it were to continue operating. As explained elsewhere in this document, we do not agree that Utah's modeling assumptions were erroneous. We take no position in this action on whether Utah should have taken credit for emission reductions at Carbon starting from a point at which emissions exceeded those in 2002, and do not rely on this consideration for our disapproval of the State's BART Alternative.

Comment: [Conserv Orgs, p. 39] Utah's BART Alternative Does Not Achieve Greater Reasonable Progress Based on the "Clear Weight-of-evidence" Utah's Regional Haze SIP also must be rejected under 40 C.F.R. § 51.308(e)(2)(i)(E) because it does not achieve "greater reasonable progress" based on the "clear weight-of-evidence."[11]

At the outset, Utah's proposed reliance on the "clear weight-of-evidence" test is improper. In promulgating regulations allowing for the test, 40 C.F.R. § 51.308(e)(2)(i)(E), offered the following example of when the test might be appropriate: "(1) The alternative program achieves

[9] EPA instead stated "the State compared the Utah BART alternative to a BART Benchmark that included the most stringent NO_x BART controls, SCR plus new LNBs and SOFA, at the four BART units." 81 Fed. Reg. 2015 (Jan. 14, 2016). (FN15 in document).
[10] See 70 FR 39104, 39165 (July 6, 2005).
[11] 40 CFR § 51.308(e)(2)(i)(E).

emissions reductions that are within the range believed achievable from source-by-source BART at affected sources, (2) the program imposes a firm cap on emissions that represents meaningful reductions from current levels and, in contrast to BART, would prevent emissions growth from new sources, and (3) the State is unable to perform a sufficiently robust assessment of the programs using the two pronged visibility test due to technical or data limitations."[12] None of those conditions is met here. Most importantly, Utah's BART Alternative does not drive any meaningful reductions from "current levels" and does not prevent emissions growth from new sources, and Utah is not hindered by any technical or data limitations preventing a sufficiently robust visibility assessment. EPA further noted that "a weight-of-evidence comparison may be warranted" "when there is confidence that the difference in visibility impacts between BART and the alternative scenarios are expected to be large enough."[13] Here, as EPA correctly observed, even Utah's flawed modeling demonstrated the superiority of BART using the most relevant visibility metric and only minimal benefits of the BART Alternative and compared with BART using other metrics.

Response: The response to this comment is provided in the FRN.

Comment: [Conserv Orgs, p. 40] In particular, EPA discusses Utah's reliance on the purported improvement in the number of days with significant visibility impairment under the BART Alternative, annual average visibility impacts, and 90th percentile impacts. All are improper.

Response: The response to this comment is provided in the FRN and in this RTC document.

Comment: [UARG, p. 14] In the Proposed Rule, EPA describes this section 51.308(e)(3) test but then speaks confusingly about how, in EPA's view, the test applies – or does not apply – when BART and a BART alternative would result in a different balance of pollutants, such as where the BART alternative results in fewer tons of NO_x emission reductions than BART but more tons of SO_2 and PM_{10} emission reductions, as is the case with the Utah BART Alternative. EPA asserts that in those circumstances, "it is not appropriate to use the 'greater emission reductions' test" and that states should instead use the 40 C.F.R. § 51.308(e)(2)(i)(E) weight-of evidence approach. 81 Fed. Reg. at 2028. Shortly thereafter, however, EPA says instead that in such circumstances, EPA gives greatest weight to modeling-based analyses of visibility impacts. *Id.* It is not clear or consistent for EPA to say that the weight-of-evidence approach should be used if instead EPA believes dispersion modeling under section 51.308(e)(3) is the proper analytical technique.

Response: We have responded to these comments in the FRN.

h. Legal Analysis

Comment: [Conserv Orgs, p. 10] Utah initially proposed a hearing before the Utah Air Quality Board in January 2015 for consideration of its BART determinations. Utah delayed that hearing

[12] Final Rule, Revisions to Provisions Governing Alternative to Source-Specific Best Available Retrofit Technology (BART) Determinations, 71 Fed. Reg. 60,612, 60,621 (Oct. 13, 2006).
[13] *Id.* at 60,622.

until February 2015. Thus, Utah failed to even seek adoption of its SIP, let alone submit it to EPA, within the 2-year statutory deadline.

Response: The EPA disagrees in part with the commenter. The commenter appears to be referring to the deadline in Section 110(c)(1) of the CAA, which requires that once EPA finds that a state has failed to make a required SIP submission (as EPA did here, 77 FR 73455 (Dec. 14, 2012)), EPA is required to promulgate a FIP within two years, unless the state submits a SIP and EPA approves it within the two year period. While the State's SIPs were submitted on June 4, 2015 and October 20, 2015, which was during the period when we were "working towards meeting our legal obligations that have resulted from our January 2013 partial disapproval action for Utah's May 2011 regional haze SIP", [14] EPA nevertheless evaluated them in this rulemaking. Also, the link provided in this comment is broken, and therefore the EPA cannot evaluate the state's decision to delay the hearing from January 2015, to February 2015. Ultimately, this comment does not provide an issue that affects the EPA's final action.

Comment: [Conserv Orgs, p. 10] Utah also failed to comply with regulatory requirements for public comment. Utah initially promised that the public would receive at least a 60-day comment period.[15] The Conservation Organizations began communicating with Utah's Division of Air Quality (UDAQ) in August 2014 to attempt to obtain visibility modeling files on which Utah intended to rely for its regional haze SIP. At that time, Utah indicated its intent to perform independent visibility modeling to support its regional haze SIP and agreed to provide to the Conservation Organizations the modeling files Utah had received from PacifiCorp. When we received such files from Utah in September 2014, output files with CALPUFF modeling results for all affected Class I areas were omitted. After repeated attempts to obtain such output files, Utah finally indicated that it never received them from PacifiCorp and, apparently, did not intend to request them. Thus, neither UDAQ nor the public were able to critique, verify, or replicate PacifiCorp's visibility modeling. When Utah formally released its draft proposed SIP on October 1, 2014 its BART determinations relied exclusively on PacifiCorp's modeling for a single Class I area.[16] At that time, Utah indicated that the state still intended to perform modeling that would support these BART determinations already made.

Response: The commenter is correct that Utah did not have PacifiCorp's modeling files and was not able to provide such files for public review during its October 2014 public comment period on its proposed *source-specific* NO_x and PM BART SIP. Subsequently, in April 2015, Utah sought public comment on another proposed SIP vision that included the NO_x BART Alternative. Utah conducted its own modeling for the April 2015 proposed SIP including its proposed BART Alternative, BART Benchmark and baseline scenarios for the impacted nine Class I areas. The original PacifiCorp modeling files became irrelevant at that point. It is our understanding that all of Utah's modeling files for the proposed BART Alternative SIP were

[14] Letter from Carl Daly to Bryce Bird, at 1. This letter is dated April 30, 2015, and not May 1, 2015 as referenced in the comment.
[15] *See* Exhibit 11 hereto, p. 15 (UDAQ Regional Haze SIP PowerPoint Presentation dated June 6, 2012).
[16] As is the case in Utah, pollution plumes from BART sources often affect visibility at numerous Class I areas. Therefore, as will be discussed further in this comment letter, it is imperative that the cumulative visibility benefits of various air pollution controls be assessed rather than the benefits from a single Class 1 area.

available upon request during its April 2015 public comment period. Furthermore, EPA conducted our own modeling for the FIP.

Comment: [Conserv Orgs, p. 17] In lieu of approving a non-compliant SIP, EPA must promulgate a FIP to fill the void left by Utah's deficient state proposal.

Response: We appreciate the commenters' support of our finalization of the co-proposal to disapprove the SIP and issue the FIP.

Comment: [UCARE, p. 2] UCARE members request that the FIP for Utah address any disproportionately high and adverse human health, economic, and environmental impacts on minority and low-income communities in Utah. This may be accomplished consistent with federal Executive Order 12898, which establishes environmental justice policy. One tool that might be used to assess societal impacts of haze generation sources, especially as they relate to EGU-generated pollution, is the EPA's Societal Cost Test that includes consideration of costs and benefits such as health impacts. The EPA should solicit public comments on what the range of societal impacts unique to Utah ought to include.

Response: The response to this comment is provided in the FRN.

Comment: [UDAQ, p. 3, FN3] EPA was compelled to act on the 2008 RH SIP under the terms of the consent decree resulting from a lawsuit filed by WildEarth Guardians. See 77 Fed. Reg. 74,355-02, at 74,357 (EPA acknowledging the obligation to take final action on Utah's RH SIP by October 31, 2012 under the terms of the consent decree with WildEarth Guardians).

Response: This is a synopsis of the history and EPA takes noposition on this summary.

Comment: [UDAQ, p. 3] Under the CAA, EPA had to determine whether the 2008 RH SIP submission was complete by March 9, 2009. See 42 U.S.C. § 7410(k)(1)(B). EPA took no action and also failed to reach a final determination by March 9, 2010. Id. §7410(k)(2). In the meantime, and despite EPA's continued inaction, Utah submitted a supplement to the 2008 RH SIP to further clarify Utah's BART determinations.

Response: This is a synopsis of the history and EPA takes noposition on this summary.

i. BART Alternative

Comment: [EE, p. 5] EPA's proposal describes the Utah SIP as "an alternative to BART" and demonstrates support for BART Alternatives in general by stating "the idea of a BART alternative…is a reasonable one, and one that EPA supports where consistent with the CAA and [regional haze requirements]." 81 *Fed. Reg.* at 2006. EPA also states that it "supports the use of a weight-of evidence determination as an alternative to the methodology set forth in section 51.308(e)(3)." *Id.* at 2024. Accordingly, because Utah's SIP revisions rely on a BART Alternative and weight of the evidence approach, it is consistent with EPA's regional haze regulations.

Response: We agree with this comment, however, in this instance, the WOE does not clearly demonstrate that the alternative would achieve greater reasonable progress.
Comment: [EE, p. 8] There is no reason for EPA not to finalize its proposal to approve the SIP. The sole question is whether the Utah SIP's BART Alternative meets the applicable BART Alternative requirements. Given EPA's own analysis, it clearly does. Consistent with EPA's regional haze regulations, as long as the BART Alternative complies with applicable requirements, EPA should accept this approach in lieu of a BART determination contained in the co-proposed FIP.

Response: As explained elsewhere, EPA disagrees with this comment.

Comment: [Conserv Orgs, p. 18] Utah's BART Alternative is arbitrary and capricious because it relies on legally and factually erroneous assumptions.

Response: As explained elsewhere in detail, EPA agrees in part with these comments.

Comment: [Conserv Orgs, p. 18] Utah's BART Alternative also fails to demonstrate by the universally accepted metric that it "will achieve greater reasonable progress than would have resulted from the installation and operation of BART at all sources subject to BART in the State and covered by the alternative program."[17]
Response: EPA agrees with this comment.

Comment: [UPHE, p. 6] It would seem basic that for a regulatory action by the State of Utah to qualify as an "alternative program" to requiring PacifiCorp to install BART NO_x controls on its covered plants, that the action would have to provide PacifiCorp with an incentive to do something that it would not otherwise do. There is no evidence that this basic prerequisite to defining a regulatory action as an "alternative program" has been met here. The Carbon complex was already at the end of its economically useful life, and there was no realistic prospect that its life could be meaningfully prolonged in view of the series of required retrofits that were in the regulatory pipeline.

The nearest that Utah comes to showing that its "alternative program" actually incentivizes PacifiCorp to do something that it wouldn't otherwise do, is to assert that after PacifiCorp closed the Carbon plant, and made the needed reconfigurations of its transmission network, Utah's SIP obligated PacifiCorp not to put the Carbon plant back in service.^ [Cite the EPA Notice]. This is not a meaningful quid pro quo for releasing PacifiCorp from the obligation that it would otherwise have to install BART NO_x controls on its units subject to BART.

Response: We disagree with most of these comments, first, there is nothing in the regulations that requires a BART Alternative provide an incentive for a BART source to do something that it would not otherwise do. Second, we take no position on the statement that the Carbon complex was at the end of its economically useful life, and there is nothing in the regulations that require us to consider that information. Finally, we address statements regarding reconfigurations of the transmission network and other comments on capacity and emission shifting the FRN.

[17] *Id.* § 51.308(e)(2)(i).

Comment: [NPS Tech, pp. 38-40] We have seen several BART Alternatives accepted by states and/or EPA. The BART Alternatives listed below all conformed to the Preamble discussion to the 2006 rule (p. 60620):
In the case of ***programs designed solely to satisfy BART requirements***, which ***may arguably be limited to BART sources only***, the approach set forth in the final rule provides the opportunity for an individual source not to be regulated by a trading program. [emphasis added]

We request that EPA explain what it means by use of the term "may arguably be limited to BART sources only." If the UDAQ BART Alternative, which is designed "solely to satisfy BART requirements," is, indeed, "limited to BART sources only," then Hunter Unit 3 and Carbon cannot be included. This would drastically change the results of the "better than BART" analyses.

The following alternatives are limited to emissions from units that are subject to BART and within the facility fence line:

- The Four Corners Power Plant (Navajo Nation) shut down three coal-fired EGUs in exchange for delayed installation of SCR on two remaining EGUs.
- The Navajo Generating Station will effectively shut down one coal-fired EGU in exchange for delayed reductions at the two remaining coal-fired EGUs.
- The Boardman Power Plant (OR) will shut down its coal-fired EGU by 2020 in exchange for less stringent interim SO_2 and NO_x controls.
- The Centralia Power Plant (WA) will shut down one coal-fired EGU in 2020 in exchange for delaying shut down of the second EGU to 2025.
- Alcoa agreed to limit sulfur content of its petroleum coke at its Intalco (WA) primary aluminum smelter.
- Under the Apache BART Alternative, one BART EGU would be converted from a primarily coal-fired unit to a unit that combusts pipeline-quality natural gas, while a second BART EGU would remain as a coal-fired unit and would be retrofitted with Selective Non-Catalytic Reduction.

We have also seen BART Alternatives that stay within the fence line of an affected facility but include emission units and/or pollutants not subject to BART, and are based on CALPUFF modeling:

- Tesoro Refinery (WA) traded SO_2 reductions in lieu of NO_x reductions.
- Georgia Pacific (WI) traded SO_2 and NO_x reductions among BART and non-BART boilers at its Green Bay (WI) Kraft pulp mill.[18] WI incorporated provisions of EPA's Economic Incentive Program.

[18] Under the state BART rule, s NR 433.06, Wis. Adm. Code, sources may trade emissions in complying with BART requirements. In using a trading approach, a facility is not allowed to trade with other facilities and must account for other sources at the facility serving the same function - thus avoiding load shifting. The rule also requires that any trading program fulfill two criteria: first, an additional 10% reduction beyond the BART requirement for the pollutant being offset with emissions trading. Second, any trading of emissions must result in visibility improvement equivalent to BART emission requirements plus the 10% additional reduction. (FN58 in NPS document).

The 1999 Regional Haze Rule provides that, "…States may elect to adopt alternative measures, such as a regional emissions trading program…" and this provided the basis for the WRAP trading program for SO_2, in which UT is a participant. And, the preamble to the 2006 Alternative BART rule (pp. 60619-20) provides examples of trading programs [emphasis added]:

- …trading programs generally include all sources within a ***source category*** in a trading region…
- States in the WRAP designed their program to apply to ***all stationary sources*** with actual emissions of 100 tons per year or more, regardless of the type of source or the age of the facility.
-

CAIR/CSAPR, Colorado,[19,20] Maryland, Massachusetts and North Carolina went beyond the fence line to use emission trading programs to satisfy BART reductions. These are examples of "…a trading program or other similar alternative program has been designed primarily to meet a Federal or State requirement other than BART…"[21]

Response: The response to this comment is provided in the FRN.

Comment: [NPS Tech, p. 40] The UDAQ BART Alternative is unique in that it is not a pre-existing state program (like CO, MA, MD and NC) and goes beyond the fence line of the BART-eligible Hunter and Huntington facilities to include a facility (Carbon Power Plant) not eligible for BART and a pollutant (SO_2) already covered under a separate BART trading program.[22] For these reasons, it is our understanding that the UDAQ approach is more similar to the trading programs previously cited than the BART Alternatives listed above. To conform to the intent of the 1999 Regional Haze Rule, it seems the UT trading program should include all significant sources within a ***source category*** (EGUs) in a trading region (UT).

Response: As discussed in the FRN, we agree the Utah BART Alternative is unique, however, as also discussed in the FRN we disagree that the trading provisions of the RHR apply.

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[19] "…the State's BART alternative program was designed to meet requirements other than BART." ENVIRONMENTAL PROTECTION AGENCY, 40 CFR Part 52, [E PA–R08–OAR–2011–0770, FRL–9650–7], Approval and Promulgation of Implementation Plans; State of Colorado; Regional Haze State Implementation Plan, ACTION: Proposed rule. March 26, 2012 (FN 59 in NPS document).

[20] "In 2010, the Colorado General Assembly adopted legislation authorizing the Air Quality Control Commission and the Public Utilities Commission to develop a comprehensive plan for coal-fired electric generating units in the state that would address not only regional haze but also potential new ozone standards and mercury standards, as well as other requirements that, in the State's view, could apply to coal-fired electric generation units in the foreseeable future. The State desired to address these issues in a coordinated way in order to achieve the most cost-effective strategy that accounted for not only current, but other imminent regulatory requirements." ENVIRONMENTAL PROTECTION AGENCY, 40 CFR Part 52, [E PA–R08–OAR–2011–0770, FRL–9734–8], Approval and Promulgation of Implementation Plans; State of Colorado; Regional Haze State Implementation Plan. ACTION: Final rule. December 31, 2012 (FN60 in NPS document).

[21] ENVIRONMENTAL PROTECTION AGENCY, Revisions to Provisions Governing Alternative to Source-Specific Best Available Retrofit Technology (BART) Determinations, Final rule. October 13, 2006 (FN61 in NPS document).

[22] 40 CFR 51.309.

Comment: [UPHE, p. 53] Utah's DAQ has amended its regional haze SIP to label the status quo as "an alternative plan" to applying the Best Available Retrofit Technology to NO_x emissions from PacifiCorp's central Utah generating units that are subject to BART. This is an abdication of its responsibility under the EPA's regional haze rules to require the installation of BART technology unless there is an alternative that is superior to BART. The status quo is clearly not that. Compared to the status quo, applying BART would reduce NO_x emissions by 87%, removing over 14,000 tons of NO_x from Utah's skies.

DAQ declines to take this opportunity to achieve much-needed reductions in the smog that enshrouds Utah's world-renowned Big 5 national parks three-quarters of the time, and which severely degrades their cultural and economic value to the State of Utah. DAQ's explains that it is doing this to avoid the cost that BART technology would impose on PacifiCorp and, by implication, Utah rate payers. That annual cost, however, is a relatively small (3.7%) compared to Rocky Mountain Power's annual revenues. This annual cost ($77 million) is almost certainly exceeded by the annual benefits in increased labor productivity and reduced health costs of $68 million when they are combined with the increase in commercial value of Utah's world-famous national parks and wilderness areas (worth $750 million annually) as vastly-reduced NO_x pollution clears the air over these scenic vistas. To this commercial benefit, the EPA should add the cultural benefit of affording Utah's residents all across the State the increased enjoyment of their immediate surroundings beneath a bluer sky.

Had DAQ done a comprehensive cost/benefit analysis of this kind, it likely would do what regulators in surrounding states have done—order PacifiCorp to apply the best available retrofit technology to remove unnecessary NO_x emissions from the air in those states. UPHE urges DAQ to join those states in requiring PacifiCorp to apply the Best Available Retrofit Technology to the NO_x emissions of its central Utah power plants.

Response: As explained in section 1.j.i, total capital costs, annualized or otherwise, is not a relevant consideration under the BART Benchmark, Alternative, or FIP. However, we acknowledge that the cost comments support our final action.

We disagree that additional consideration of the cultural benefit of improved air quality is necessary, as visibility considerations already play a key role in making control determinations pursuant to the five-factor BART analysis. We also disagree that cost/benefit analyses that attempt to monetize the value of visibility and other benefits and compare their value to the cost of compliance are appropriate in the regional haze context. The CAA and RHR specify the five factors states and EPA must consider in making BART determinations, and the BART Guidelines provide that the appropriate metric concerning cost is cost effectiveness as measured by dollars per ton of emissions reduced. 40 CFR Pt. 51, App. Y, IV. D.4.

Comment: [UARG, p. 10] The CAA itself does not establish any test for evaluating BART alternatives. The courts of appeals, however, have explained that the basis for EPA's authority to approve BART alternatives is that such alternatives are grounded in the CAA's reasonable progress provisions. *See, e.g., Utility Air Regulatory Grp. v. EPA*, 471 F.3d 1333, 1340-41 (D.C. Cir. 2006); *Ctr. For Energy & Econ. Dev. v. EPA*, 398 F.3d 653, 659-60 (D.C. Cir. 2005); *Cent. Az. Water Conservation Dist. v. EPA*, 990 F.2d 1531, 1543 (9th Cir. 1993). A state, therefore,

may reasonably exercise its discretion under the BART rules and the weight-of-evidence test to consider a broad array of factors that are germane to determining reasonable progress requirements when it evaluates a BART alternative. The factors Utah considered are not precluded by the reasonable progress criteria listed in the CAA and the regional haze rule[23] or by any other provision of the Act or the rule.

Response: We adopted regulations in 1999 allowing states to adopt alternative measures in lieu of BART to provide flexibility in achieving reasonable progress. In explaining the rationale for our decision to do this, we noted that the regulations would still ensure that, "at a minimum, the degree of visibility impairment attributable to BART sources is addressed by the States during the first long-term strategy." [24] We further noted that to take advantage of this flexibility, the burden is on the State to demonstrate that the alternative measure achieves greater reasonable progress.[25] We later revised our regulations to adopt a specific test that states may use to demonstrate that an alternative measure provides better visibility conditions based on air quality modeling.[26] We then subsequently revised our regulations again to add a general test for states to demonstrate that an alternative achieves greater reasonable progress than BART based on the clear weight-of-evidence.[27] In response to comments that such a test was vague, we stated that "[t]he State's discretion in this area is subject to the condition it must be reasonably exercised and that its decisions be supported by adequate documentation of its analyses."[28]

We carefully evaluated the factors considered by Utah and have explained in the FRN why certain of the factors chosen by Utah are not appropriate for assessing whether its BART Alternative will achieve greater visibility benefits than would BART. As explained in the FRN, EPA from the beginning has been clear that the test is whether an alternative measure will provide for greater visibility improvement. We thus determined that two of the factors the State considered were not relevant to the weight-of-evidence analysis because they do not relate to visibility impacts under the BART Benchmark or Alternative. We considered the remaining factors, all of which relate to visibility impacts. We are not basing our disapproval on an argument that those remaining factors are not appropriate, for example, because they are precluded by the reasonable progress factors listed in the CAA and the RHR but rather on our evaluation that the factors considered by Utah do not show based on the clear weight-of-evidence that the alternative would provide for greater visibility improvement.

Comment: [UARG, p. 11] A recent decision of the U.S. Court of Appeals for the Tenth Circuit provides further support for Utah's BART Alternative determination. In *WildEarth Guardians v. EPA*, the court determined that, in approving states' BART alternative, it was proper for EPA to take various qualitative factors into account – including that the BART alternative at issue there applied to non-BART as well as BART sources and encouraged achievement of emission reductions earlier than under BART – when the Agency reviewed BART alternatives in SIPs

[23] Those factors are: the costs of compliance; the time necessary for compliance; the energy and non-air quality environmental impacts of compliance; and the remaining useful life of existing sources that contribute to visibility impairment. CAA § 169A(g)(1); 40 CFR §51.308(d)(1)(i)(A).
[24] 64 FR 35714, 35741 (July 1, 1999).
[25] *See* id.
[26] 70 FR 39104 (July 6, 2005).
[27] 71 FR. 60612 (Oct. 13, 2006).
[28] 71 FR at 60621 (Oct. 13, 2006).

applying the weight-of-evidence test. 770 F.3d 919, 933-38 (10th Cir. 2014). Utah cited those same factors in support of its BART alternative here, and the other factors Utah invoked are also easily within the compass of the weight-of-evidence test. Such an approach is, moreover, consistent with language in the BART alternative rules that EPA cites in the current rulemaking, which state that weight-of-evidence determinations "'attempt to make use of *all available information and data which can inform a decision* while recognizing the relative strengths and weaknesses of that information in arriving at the soundest decision possible.'" 81 Fed. Reg. at 2011-12 (quoting 71 Fed. Reg. 60,612, 60,622 (Oct. 13, 2006) (emphasis added)).

Response: We agree that a BART alternative may include non-BART sources and that the timing of emission reductions can be considered in the evaluation of whether the Alternative provides for greater reasonable progress than the BART Benchmark. However, as explained elsewhere in this document, we disagree that all the factors Utah included in its weight-of-evidence evaluation are appropriate to consider.

Comment: [UARG, pp. 14-16] Even more confusing, in the next paragraph of the preamble to the Proposed Rule, EPA states that Utah "appears to satisfy the first part of the test under 40 CFR 51.308(e)(3) (the distribution of emissions may not be substantially different than under BART) since the Hunter, Huntington and Carbon plants are all located within close proximity of each other in central Utah." *Id.* Under the plain meaning of the BART rules, therefore, no dispersion modeling is necessary and a simple showing of greater emission reductions under the BART Alternative should suffice. EPA asserts, however, that it has "not looked at a total emissions profile that combines emissions of multiple pollutants to determine whether a BART benchmark or a BART alternative is 'better,' except where every visibility impairing pollutant is reduced by a greater amount under the BART alternative." *Id.* (footnote omitted).

EPA does not assert, however, that it *could not* examine such a "total emissions profile"; much less does EPA explain why such a review would not be possible. EPA also does not explain why Utah's approach to reviewing total emission changes was inadequate, unlawful, or unapprovable – if indeed EPA believes it was inadequate, unlawful, or unapprovable. Here, Utah evaluated the emission reductions for each pollutant and noted the additional reductions in SO_2 and PM_{10} emissions that are attributable to the BART Alternative. *See id.* at 2016. Utah acknowledged that the BART Alternative would achieve fewer NO_x reductions than the Benchmark would, but emphasized the crucial fact that SO_2 emissions contribute more to visibility impairment.

Significantly, the BART Alternative achieves 8,005 more tpy of SO_2 emission reductions than the Benchmark, while the Benchmark achieves only 5,721 more tpy of NO_x emission reductions. *Id.* Further, Utah noted that the BART Alternative achieves greater combined emission reductions than the Benchmark. *Id.* EPA – which does not dispute or question Utah's numbers – provides no reasoned basis for rejecting or disregarding the state's analysis. Because the state's analysis is reasonable, moreover, EPA does not provide a sufficient justification for its proposed decision to interpret the first prong of 40 C.F.R. § 51.308(e)(3) to apply only "when the BART alternative 'achieves greater emission reductions than each of the individual BART determinations' for each of the pollutants, 'as well as in the aggregate.'" *Id.* At 2028 (footnotes omitted).

Response: We have responded to these comments elsewhere.

j. Evaluation of the Weight-of-Evidence

Comment: [EE, pp. 1-2] For the reasons discussed in our attached comments, EE urges EPA to approve Utah's state implementation plan (SIP) in its entirety and reject the federal implementation plan portion of the proposal. EPA regulations allow states to undertake a BART Alternative and to use a weight-of-evidence approach when crafting regional haze SIPs, which supports approval as proposed of the Utah SIP. Moreover, EPA undervalues the large sulfur dioxide emission reductions and their substantial and superior visibility improvements, and improperly downplays the cost difference between the BART Alternative included in the SIP and the FIP. Finally, the BART Alternative is more likely to result in future reasonable progress than the co-proposed FIP. In summary, EPA has proposed to approve the SIP and should do so.

Response:
As explained in section 1.j.i, the total capital cost of controls is not a relevant consideration.

Comment: [PacifiCorp, p. 26] Evaluation of Weight-of-evidence [SIP Proposal] As explained above, the weight-of-evidence analysis is not the exclusive province of EPA. Rather, in considering whether to approve the SIP Proposal, EPA should give great weight and deference to what evidence Utah selected, how Utah elected to weigh that evidence in evaluating the BART Alternative, and to Utah's conclusions. In other words, it is not EPA's role to apply this test *de novo* as EPA attempts to do here. Because EPA already has properly proposed to find that Utah correctly followed the Applicable BART Alternative Requirements, properly weighed the evidence and available metrics and reached a logical and rationale conclusion, EPA's role should be limited to explaining the foregoing and approving the Utah SIP. This is particularly true given EPA's statement that "it is preferable that the regional haze program be implemented through state plans." See 81 FR at 2006.

PacifiCorp agrees with EPA that the following evidence should carry the most weight: (i) the BART Alternative produces 8,005 fewer tpy of SO_2 emissions and 2,856 fewer tpy of combined emissions than the BART Benchmark (see 81 FR at 2024); (ii) the BART Alternative produces 48 fewer days of impact above 1.0 dv, and 145 days of impact above 0.05 dv (*Id.*)[29]; (iii) the IMPROVE monitoring networks shows that a reduction in SO_2 emissions (in this case 8,005 tpy) "provides visibility benefits throughout the year" as compared to NO_x emission reductions which don't, that "sulfate is the largest contributor to visibility impairment at affected Class I areas," and that the BART Alternative provides for the greatest SO_2 reductions (in this case 8,005 tpy more than the BART Benchmark)(*Id.*); and (iv) the BART Alternative produces a far earlier start to emission reductions through earlier installation of emission controls (compared to the BART Benchmark), beginning in 2007 and continuing on through August 2015. (*Id.*) In short, as compared to the BART Benchmark, the above evidence alone (which EPA agrees should carry significant weight) demonstrates that the BART Alternative – as compared to the BART

[29] Elsewhere in the Proposed Action EPA uses 18 fewer days above the 1.0 dv threshold and 175 fewer days above the 0.5 dv threshold. See 81 FR at 2022, 2029. It is not clear why EPA uses different data here, but the fact is that all of the cited data supports both giving great weight to this metric and EPA's overall conclusion to approve the BART Alternative.

Benchmark – produces greater reasonable progress in the form or greater SO_2 and overall emission reductions, more overall days of improved visibility, better visibility benefits throughout the year, and a significantly earlier start to emission reductions. EPA correctly proposes to conclude that the weight of this evidence produces greater reasonable progress and requires approval of the BART Alternative.

In addition, for the reasons explained above and summarized below, EPA should apply additional weight (or in the case of cost, non-air quality environmental and energy impacts, any weight) to the following evidence (or metrics). By doing so, EPA will conclude even more forcefully that it should approve the Utah SIP.

Response: We address these comments in the FRN and elsewhere in this document.

Comment: [Conserv Orgs, p. 18] Thus, it is clear that Utah bears the heavy burden of proving that its alternative satisfies the "clear weight-of-evidence" test.

Response: This comment is a characterization of the CAA and regulatory requirements, and we have addressed the specific concerns about the State's SIP elsewhere.

Comment: [Conserv Orgs, p. 49] Under the "clear weight-of-evidence" test, it would be improper to reward Utah's laggardly approach to regional haze compliance by crediting the BART Alternative as achieving earlier emissions reductions.

Response: We disagree, and think that in some instances it is appropriate to consider the timing of emission reductions from Hunter and Huntington that occurred between 2006 and 2011 in its weight-of-evidence analysis. As explained above, we consider it appropriate to take into account the timing of these reductions in assessing the BART Alternative.

i. Comparing Costs of BART and the BART Alternative

Comment: [PacifiCorp, p. 2] EPA arbitrarily refuses to consider the dramatic cost difference between the two coproposals. EPA has made clear that the BART Alternative program is intended to achieve greater visibility progress in the most cost-effective manner. The Utah SIP does just that. EPA, however, refused to consider the cost savings associated with the Utah SIP proposal. This not only violates the foundational premise of its own BART alternative rule, but it also violates one of the fundamental tenets of reasonable regulation.

Response: This comment is addressed elsewhere in Section 1.j.i.

Comment: [PacifiCorp, p. 22] *Cost* [SIP Proposal] – EPA's decision that "it is not material to our action whether we agree or disagree with Utah's conclusion that the BART Alternative would have a lower cost impact to PacifiCorp than the BART Benchmark" borders on regulatory absurdity.[30] See 81 FR at 2024. As EPA itself acknowledges, the cost of the BART Benchmark is

[30] This is particularly true because, after announcing that the significantly lower cost of the BART Alternative is not material to its final action, EPA ultimately states that "we do agree" with Utah that the BART Alternative will cost

at $400 million more than the cost of the BART Alternative (and PacifiCorp contends the cost is in excess of $700 million more). If the cost difference between EPA's competing co-proposals is not material and worthy of EPA's consideration in taking final action, then what cost information possibly could be?

EPA's proposal not to consider cost in evaluating the BART Alternative, however, fails for several reasons. First, EPA itself introduced cost as a foundational component of any BART Alternative analysis. In EPA's final Revisions to Provisions Governing Alternative to Source-Specific BART Determinations at 71 FR 60612 (October 13, 2006), EPA lays out the foundation for any state to consider a BART Alternative:

"The EPA continues to support State efforts to develop trading programs and other alternative strategies to fulfill the goals of the CAA. We believe such strategies have the potential to achieve greater progress towards the national visibility goals than more traditional approaches to regulation, **and to do so in the most cost-effective manner practicable**." 71 FR at 60614. (Emphasis added.)

In other words, in promulgating the BART Alternative rules, EPA recognized that the basis for considering a BART Alternative is twofold: (i) to achieve greater progress towards visibility goals; and (ii) to do so "**in the most cost-effective manner**." EPA cannot pass a rule based on the foundational premise of cost-effectiveness, and then apply that rule with active disregard of the very cost-effectiveness foundation upon which the rule is based.[31] In fact, considering the cost difference of the BART Alternative is consistent with the judicial philosophy which underpinned the U.S. Supreme Court's recent decision in Michigan v. EPA, 135 S.Ct. 2699 (2015). There, the court considered whether it was reasonable for EPA to refuse to consider cost in regard to regulating hazardous air pollutant from power plants. The court noted that:

"Agencies have long treated cost as a centrally relevant factor when deciding whether to regulate. Consideration of cost reflects the understanding that reasonable regulation ordinarily requires paying attention to the advantages and the disadvantages of agency decisions. It also reflects the reality that 'too much wasteful expenditure devoted to one problem may well mean considerably fewer resources available to deal effectively with other (perhaps more serious) problems.'" Id. at 2707.

Even the dissent in the Michigan v. EPA case agrees on this point: "I agree with the majority—let there be no doubt about this—that EPA's power plant regulation would be unreasonable if '[t]he Agency gave cost no thought *at all*.'" Id. at 2714. As a result, all nine justices of the U.S.

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more than $700 million less than the BART Benchmark. See 81 FR at 2024. Such inconsistent reasoning does not support EPA's refusal to consider the cost difference in its BART Alternative analysis.

[31] EPA acknowledged this principle in arguing to the court in favor of considering "the full structure and function" of the 309 program, which in essence is a BART Alternative: "Petitioners' contention that EPA impermissibly approved the backstop trading program ignores the full structure and function of the 309 program and improperly seeks to narrow the scope of EPA's discretion and this Court's review." See EPA's Primary Brief at page 15 (September 13, 2013), a portion of which is attached as Attachment 4. Likewise, EPA should consider the cost impact of the BART Alternative (including the cost difference as compared to the BART Benchmark) in order to consider "the full structure and function" of the Applicable BART Alternative Rules as described in the preamble to those rules.

Supreme Court sent a clear signal that EPA must consider cost in making agency decisions to achieve emission reduction benefits (including visibility improvement). Likewise, EPA should consider the cost difference between the BART Alternative and the BART Benchmark as part of the weight-of-evidence analysis instead of actively disregarding that cost difference as EPA has proposed to do.

EPA already has before it as part of this rulemaking docket the very cost saving benefits information it should consider in approving the BART Alternative. These costs savings are material and significant by any stretch of the imagination. EPA's refusal to formally consider the cost information is akin to the position it took in Michigan v. EPA where the court clearly and forcefully ruled that EPA could not "ignore cost." EPA should give up its attempt to do that very thing here.

Second, the CAA requirements and applicable regional haze rules have as one of their foundational components the consideration of cost. See CAA at §7491(g)(1) and (2). Also, see 40 CFR 51.308(d)(1) which states that a core requirement of a regional haze SIP is the inclusion of reasonable progress goals under which "(i)… the State must: (A) consider the costs of compliance"). It is irrational to require the consideration of cost in setting BART and reasonable progress goals, but then assert it is not even a remote consideration when evaluating a BART Alternative. Cost consideration is so fundamental to the fabric of the regional haze statutes and rules that EPA should have little trouble concluding that it must consider those costs in evaluating the BART Alternative (particularly as compared to the FIP Proposal).

Third, EPA's own interpretation of the Weight-of-evidence standard is expansive. It includes "all available information and data."[32] All means ***all***. EPA should not now add restrictions to its expansive interpretation in order to prejudicially exclude consideration of material cost impacts and cost differences. In fact, EPA's brief in the SO_2 Backstop Trading case explains that the preamble to the applicable regional haze rule allows "all available information and data" to be considered as part of the "weight-of-evidence" analysis. EPA SO_2 Backstop Trading brief at 36, 38, citing to 71 FR at 60621, 60631. Also in its brief, EPA specifically mentioned "lower compliance costs" as "'policy considerations' which EPA may properly assess under the 'clear weight of the evidence' standard when comparing BART to a BART alternative." EPA SO_2 Backstop Trading brief at 42.

Fourth, EPA is wrong to exclude consideration of costs to the extent EPA claims the BART Alternative requirements do not require cost consideration. The Proposed Action offers "two co-proposals" from which "EPA intends to finalize only one proposal." See 81 FR at 2006. The very nature of offering two co-proposals from which to select one is to compare and contrast between

[32] In evaluating the Weight-of-evidence standard, the U.S. Court of Appeals for the 10th Circuit agreed and stated that EPA itself concluded that the examples EPA listed in the BART Alternative rule described above are "not exhaustive and that the determination should be based on 'all available information and data which can information a decision….'" WildEarth Guardians v. E.P.A., 770 F.3d 919, 935 (10th Cir. 2014).

them.[33] EPA clearly considers cost to be important in proposing the FIP Proposal.[34] The nature of the Proposed Action as "two co-proposals" requires EPA to consider cost in regard to the SIP Alternative as well, particularly for the purpose of comparing the co-proposals against each other. Also, because EPA relies on non-cost portions of the BART Guidelines in evaluating a BART Alternative, then it also should rely on the BART Guidelines as justification for considering the cost savings of the BART Alternative.

Finally, Utah considered the cost impact of the BART Alternative to be important enough to respond to comments about cost as follows as part of the Utah SIP rulemaking process:

"PacifiCorp noted in their comments on the proposed SIP revision that the Alternative Measure not only produces greater reasonable progress, including lower emissions and improved visibility, but it does so at a significant capital cost savings to PacifiCorp and its customers as compared to the most stringent NO_x technology and limits. While DAQ has not officially determined the cost of installing SCR on the four units, it is clear that it would be a significant cost. On the other hand, the Carbon Plant has already been closed due to the high cost of complying with the MATS rule. The costs to Utah rate payers (and those in other states served by PacifiCorp) to replace the power generated by the Carbon Plant have already occurred; there will be no additional cost to achieve the co-benefit of visibility improvement. ***In other words, the Alternative Measure achieves better visibility improvements than would be achieved by requiring SCR as BART at the four EGUs, and at a significantly lower cost. This presents a classic "win/win" scenario – the Alternative Measure results in greater reasonable progress and that greater reasonable progress is achieved at a much lower price compared to SCR.*** Cost is one of the factors listed in section 169A(g)(2) that should be considered when determining BART." (Emphasis added.) Utah SIP; Staff Review; May 13, 2016 p. 27.

EPA likewise should consider the cost impact and differences in at least a similar manner when evaluating the BART Alternative.

As with the timing, IMPROVE and Energy/Non-Air Quality metrics discussed above, EPA does not attempt to criticize this cost metric in regard to its FIP Proposal. See 81 FR at 2031. This alone is additional evidence that the cost metric should carry great weight in EPA's weight-of-evidence analysis in support of the BART Alternative and that this metric in no way supports the BART Benchmark.

Response: EPA disagrees that the difference in total capital cost between the BART Alternative and BART Benchmark is relevant in the context of a weight-of-evidence analysis. EPA further disagrees that considering the difference in total capital cost between the BART Alternative and BART FIP is relevant or consistent with the CAA and RHR.

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[33] As explained above, PacifiCorp maintains that EPA is bound to approve the SIP Alternative and is prohibited from even considering the FIP Alternative. Because EPA proposes to consider both, however, PacifiCorp's comments regarding EPA comparing and contrasting the SIP Alternative with the FIP Alternative are applicable.
[34] See 81 FR at 2024: "We do agree" with "Utah's conclusion that the BART Alternative would have a lower cost impact to PacifiCorp than the BART Benchmark…." Also, see Proposed Action at Section VI.D.1.a (Costs of Compliance).

The commenter first states that EPA has ignored costs when comparing the BART Alternative and BART Benchmark. EPA disagrees with this comment. EPA did consider cost when evaluating the State's BART Alternative and did so in a manner consistent with the CAA and RHR—by ensuring that the cost of compliance of both the Alternative and Benchmark were reasonable before proceeding to weigh the two scenarios based on their respective visibility benefits. EPA disagrees with the commenter that the additional metric offered by the State—the difference in total capital cost between the Alternative and Benchmark—is a relevant factor under the weight-of-evidence analysis.

The CAA and RHR clearly instruct that the cost of complying with BART requirements be considered alongside and balanced against "the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology." 42 U.S.C. 7491(g)(2). Consideration of the cost of BART controls cannot be divorced from consideration of their visibility benefits. As we elaborated in the BART Guidelines:

> In the cost analysis, you should take care not to focus on incomplete results or partial calculations. For example, large capital costs would not preclude selection of a control measure if large emissions reductions are projected. In such a case, low or reasonable cost effectiveness numbers may validate the option as an appropriate BART alternative irrespective of the large capital costs. Similarly, projects with relatively low capital costs may not be cost effective if there are few emissions reduced.
> 40 CFR Pt. 51, App. Y IV.D.4.g.

Just as the total capital cost of controls does not generally provide meaningful information in choosing between control measures under a BART analysis, it is not relevant when comparing the BART Benchmark to a state's BART Alternative. An estimate of total capital cost provides no relevant information regarding whether that cost is reasonable given the associated visibility benefits. The BART Guidelines emphasize that cost effectiveness is the relevant cost consideration, and define that term as annualized control costs compared to tons of pollutant emissions removed. 40 CFR Pt. 51, App. Y, IV.D.4.b.

The cost effectiveness of both control scenarios is inherent in choosing the representative controls for the BART Benchmark and Alternative. The BART Benchmark determination is based in part of the reasonableness of the cost of compliance, and it is logical to assume that the cost effectiveness of the BART Alternative is also reasonable, otherwise a state would not propose to adopt it. Thus, cost effectiveness is properly considered in the context of selecting controls for the BART Benchmark and Alternative.

However, the RHR provides no role for further consideration of cost in comparing the two scenarios in a weight-of-evidence analysis. The provision of the RHR laying out thee requirements for BART Alternatives contains no mention of cost. *See* 40 CFR 51.308(e)(2). Rather, the purpose of the weight-of-evidence analysis is to determine if the Alternative achieves greater reasonable progress, measured in deciviews (dv), towards achieving natural visibility conditions. 40 CFR 51.308(e)(2)(i)(E). A comparison of a BART Benchmark and Alternative under a weight-of-evidence analysis must thus be based upon metrics that reflect each control

scenario's impact on visibility and its potential contribution to reasonable progress. Because the cost savings Utah presumes under its alternative have no bearing on visibility, EPA reasonably determined that this metric is not material under the weight-of-evidence analysis.

The commenter also states that EPA's determination that the difference in cost between the BART Benchmark and Alternative disregards the foundational premise of allowing States to propose BART alternatives. We disagree. While cost effectiveness is an important justification for allowing States to propose Alternatives—indeed, it is highly unlikely a State would submit a BART Alternative unless it was less costly than BART—it does not follow that EPA should allow cost to alter the fundamental requirement that an approvable Alternative achieve greater reasonable progress than BART. The commenter's interpretation of our statement concerning cost effectiveness in the BART Alternative rule all but ignores the fact that we also stated that States may adopt Alternatives "*so long as* they can demonstrate that the alternative approach will achieve greater reasonable progress towards improving visibility than . . . the BART requirements." 71 FR 60614 (emphasis added). The weight-of-evidence analysis answers just this question—whether the Alternative will clearly result in greater visibility benefits.

The commenter further asserts that the Supreme Court's *Michigan v. EPA* decision requires EPA to consider the difference in total capital cost between the BART Benchmark and Alternative. Again, we disagree. The majority in *Michigan* found that EPA unreasonably interpreted the phrase "appropriate and necessary" in section 112(n)(1)(A) of the CAA as not encompassing consideration of costs. 135 S. Ct. 2699, 2705, 2711–12 (2015). Specifically, the Court held that it was unreasonable for EPA not to consider cost in its threshold determination of whether to regulate power plants in light of the statutory language and context of CAA section 112. *Id.* Importantly, the Court did not prescribe the manner in which EPA must consider cost in making its "appropriate and necessary" finding, holding only that cost must be a factor and leaving the method of accomplishing this to EPA's discretion. *Michigan*, 135 S. Ct. at 2711.

As explained above, EPA already considers cost in determining the reasonableness of the controls that represent the BART Benchmark and BART Alternative. Our decision making in this context is thus not implicated by the *Michigan* majority's statements concerning generally the role of cost in "reasonable regulation." 135 S. Ct. at 2707. The dissent's statement that "EPA's power plant regulation would be unreasonable if '[t]he Agency gave cost no thought *at all*,'" *id.* at 2714 (Kagan, J., dissenting) (quoting maj. opinion at 2707) (emphasis in original), is similarly inapposite because EPA did, in fact, consider cost. We therefore disagree with the commenter's assertion that EPA did not consider the costs of compliance when evaluating the BART Benchmark and Alternative.

As stated above, a weight-of-evidence analysis considers only data and information related to visibility impacts. Our statements that we will consider all available information and data also make clear that the purpose of such information is to "inform the comparison of visibility impacts between BART and the alternative program." 71 FR 60612, 60622. Information that is not related to visibility, such as the difference in cost between BART and an Alternative, has no bearing on the scenarios' relative visibility impacts.

EPA also disagrees with the commenter's assertion that the nature of co-proposals requires us to compare and contrast between Utah's proposed BART Alternative and EPA's proposed BART FIP on the basis of cost of any other factor. In this instance, EPA used a co-proposal approach to create two distinct pathways describing two possible ways in which to consider Utah's weight-of-evidence analysis. The relevant comparison is therefore of EPA's proposed options for evaluating the State's analysis—one in which we propose to agree that the Alternative achieves greater reason progress, and the other in which we propose to disagree.

EPA's FIP can only exist if we find that the State's BART Alternative does not satisfy the requirement that it achieve greater reasonable progress than BART. At this point, the Alternative has already been determined not to be an acceptable option, so there is nothing to which to compare the FIP. The difference in cost between the BART Alternative and FIP is therefore meaningless, as there can never be a choice between a state's BART Alternative and a FIP. Finally, we disagree that we should consider the total capital cost impact and differences in total cost between the BART Benchmark and Alternative in at least a similar manner than Utah did in its BART Alternative SIP submission. In reviewing SIP submissions, EPA is not limited a "ministerial" role of verifying that states have made a BART determination. *Ariz. ex rel. Darwin v. U.S. EPA*, No. 13-70366, 2016 U.S. App. LEXIS 3196, at *19 (9th Cir. Feb. 24, 2016); *N. Dakota v. U.S. EPA*, 730 F.3d 750, 761 (8th Cir. 2013). Rather, we must "review the substantive content of the BART determination" to ensure that it is consistent with applicable requirements of the CAA and RHR. *Ariz. ex rel. Darwin*, 2016 U.S. App. LEXIS 3196, at *19 (quoting *N. Dakota*, 730 F.3d at 761). The same obligation to substantively review a state's BART determination also applies to reviewing a State's determination that a BART Alternative achieves greater reasonable progress than BART using a weight-of-evidence analysis.

The RHR states at 40 CFR 51.308(e)(2)(E) that a weight-of-evidence analysis is designed to determine whether a BART Alternative "achieves greater reasonable progress than would be achieved through the installation and operation of BART at the covered sources." The RHR refers to "reasonable progress" in terms of improvements in visibility. 40 CFR 51.308(d)(1) (States must establish reasonable progress goals, expressed in deciviews, "that provide for reasonable progress towards achieving natural visibility condition."). Thus, EPA is required to assess a State's weight-of-evidence metrics to determine whether they are consistent with the RHR's visibility-driven greater reasonable progress determination.

As explained, the total capital costs of the BART Benchmark and the BART Alternative, as well as the difference in total cost between the two, is not a relevant consideration under the CAA or the RHR for determining which scenario achieves greater reasonable progress. We therefore have discretion to decline to consider total capital costs when evaluating a State's weight-of-evidence analysis for consistency with the applicable requirements of the regional haze program.

We explained in our co-proposal that, "[a]s described in our 2006 revisions to the RHR, concerning BART alternatives, a State's discretion to adopt a BART Alternative "is subject to the condition that it must be reasonably exercised and that its decisions be supported by adequate documentation of its analyses."[35] Although states have the freedom to choose which metrics to consider and how to consider them in their weight-of-evidence analyses, they must come to a

[35] 81 FR 2004, 2006 (Jan. 14, 2016) (citing 71 FR 60612, 60621 (Oct. 13, 2006)).

reasoned determination. As laid out in our co-proposal and further detailed in this final action, Utah relied on methodologies that are inconsistent with the CAA and RHR and did not provide adequate support for its weight-of-evidence determination. We are therefore unable to find that the State satisfied the requirement that it reasonably exercise its discretion to adopt a BART alternative in lieu of BART.

Comment: [PacifiCorp, p. 26] Evaluation of Weight-of-evidence [SIP Proposal]
3. *Costs and Energy/Non-Air Quality Impacts* – EPA should consider, as material evidence with significant weight, the cost savings available by approving the BART Alternative as compared to the BART Benchmark. Indeed, EPA will be arbitrary and capricious in its decision-making if it fails to consider this cost difference. This is particularly true if EPA's failure to consider the cost savings under the BART Alternative leads EPA to disapprove the SIP Proposal and instead approve the FIP proposal. This also is true for the energy/non-air quality impacts which EPA should have taken into account.

Response: This cost portion of this comment is addressed elsewhere in Section 1.j.i.
The energy and non-air quality impacts portion of this comment is addressed in Section 2.b.viii.

Comment: [UARG, p. 10] As additional evidence in support of the BART Alternative, Utah cited the savings associated with avoiding the annual energy penalty of operating SCRs, additional non-air quality benefits associated with the Carbon plant's closure, and lower costs of the BART Alternative compared to the BART Benchmark. *See id.* at 2024. EPA contends that these considerations do not have a "direct bearing on whether the BART Alternative achieves greater reasonable progress" than the BART Benchmark and that they are, accordingly, "not material." *Id.* at 2024, 2025. That position is inconsistent with the CAA, case law, and EPA's own past statements about evaluation of BART alternatives.

Response: The cost portion of this comment is addressed elsewhere in Section 1.j.i.
The energy and non-air quality impacts portion of this comment is addressed in Section 2.b.viii.

Comment: [UARG, p. 11] Further, EPA has previously emphasized the importance of cost savings when evaluating a BART Alternative. In EPA's supplemental proposed regional haze rule for the Four Corners Power Plant ("FCPP"), in which EPA proposed approval of a BART alternative for NO_x emissions from FCPP, the Agency included a relative cost assessment of the FCPP BART alternative and EPA's proposed BART determination for the facility in a section of its proposal entitled "EPA's Technical Analysis of Better Reasonable Progress Towards National Visibility Goal." 76 Fed. Reg. 10,530, 10,534-40 (Feb. 25, 2011). In that section of the proposed rule, EPA concluded that the BART alternative would have a lower cost than EPA's proposed BART determination and emphasized that the alternative "should be approximately 39% less costly than EPA's proposed BART determination." *Id.* at 10,540. EPA's decision to evaluate this factor in the FCPP rulemaking is particularly significant because there was no state action for EPA to review and because EPA stated that the operator of FCPP had not provided "any" BART alternative cost information to the Agency; thus, both of these circumstances mean that EPA took the initiative entirely on its own to assess relative costs as a BART-alternative factor. *Id.*; *see also* 77 Fed. Reg. 51,620, 51,621 (Aug. 24, 2012) (promulgating the BART alternative for

FCPP and concluding that the BART alternative "would result in greater visibility improvement in surrounding Class I areas at a lower cost than our . . . BART proposal"). EPA therefore cannot reasonably deny the relevance of relative costs in assessing Utah's BART alternative. EPA is wrong to disregard, reject, or discount Utah's consideration of relative costs and of other environmental and energy benefits of the Utah BART Alternative as compared to the BART Benchmark.

Response: As explained elsewhere in this document, the total capital cost of controls is not a relevant consideration when determining whether or not a BART Alternative achieves greater reasonable progress than BART. EPA's statements regarding cost in the FCPP rulemaking are inapposite because the contexts of the two rulemakings are materially different. We explained in the FCPP final action that while we acknowledged that the RHR "does not require an analysis of the cost of the alternative plan," we undertook a more extensive analysis of costs in this instance at the request of the Navajo Nation, pursuant to "EPA's customary practice of engaging in extensive and meaningful consultation with tribes." 77 FR 51620, 51624 (Aug. 24, 2012).

The FCPP rulemaking is further distinguished from Utah's context based on the facts of that action. For FCPP, EPA had two choices to satisfy its FIP obligation—require either BART controls or a BART Alternative. We found that the BART Alternative satisfied the "greater reasonable progress" requirement of the RHR because it resulted in greater visibility improvement at each of the affected Class I areas. 76 FR 10530, 10540. However, as noted elsewhere in this document (Section 1.j.i), both common sense and the RHR presume that states or EPA will propose BART Alternatives only when it is cost effective to do so. EPA's statement that it was proposing a BART Alternative for FCPP because "it would result in better visibility improvement at lower cost than . . . BART" constitutes our justification for proposing to adopt the Alternative as our FIP. *Id.* EPA's final action gave the operator of the FCPP the option to comply with either EPA's BART determination or, alternatively, with the BART Alternative. 77 FR 51620, 51621. Cost could appropriately play a role in this decision only because we had already determined that the Alternative would result in visibility benefits than BART. In contrast, in Utah we are unable to find that the Alternative would result in the degree of visibility improvement than BART, precluding a choice between BART and the Alternative.

Comment: [EE. pp. 7-8, Comment on cost] The regional haze rules clearly require the consideration of cost. EPA's regulations state that a core requirement of a regional haze SIP is the inclusion of reasonable progress goals under which "(i)… the State must: (A) consider the costs of compliance". *See* 40 C.F.R. §51.308(d)(1). Yet, EPA states that "It is not material to our action whether we agree or disagree with Utah's conclusion that the BART Alternative would have a lower cost impact" than direct application of BART. *Id.* at 2024. Consideration of cost is fundamental to evaluating the BART Alternative (especially in comparison to the proposed FIP). By EPA's own estimates, its FIP would cost $440 million more just for capital costs (and the owner of the units believes this is an underestimate of the true cost). It is inappropriate for EPA to ignore the differential in cost.

Response: Consideration of cost in the context of evaluating the BART Alternative is addressed elsewhere in Section 1.j.i. See responses in Section 4 of this document for discussion of EPA's estimate of the cost of the FIP.

Comment: [UAMPS, pp. 6-7] Utah demonstrated that the costs of compliance of the Utah BART Alternative are lower than the costs of compliance of BART and the proposed FIP. EPA agrees with Utah that the cost impact of the Utah Bart Alternative is lower than the cost impact of BART.[36] However, EPA's proposes to ignore cost impact and find, instead, that the beneficial cost difference does not have a direct bearing on whether the Utah BART Alternative achieves greater reasonable progress than BART and that the cost difference is not material to the Proposed Action. Id. EPA's proposal to ignore costs of compliance is contrary to law, arbitrary and capricious. The Clean Air Act mandates that "in determining reasonable progress there shall be taken into consideration the costs of compliance ... "42 U.S.C. 7491(g)(1).[37] Costs of compliance are statutorily embedded in the definition of "reasonable progress," and any determination of "greater reasonable progress" must by definition consider costs of compliance. Consideration of the costs of compliance is, therefore, a proper and necessary element of a weight-of-evidence analysis under 40 CFR 51.308(e)(2)(i)(E) to determine if a BART Alternative achieves greater "reasonable progress" than BART from a cost perspective. EPA's rejection of any consideration of costs of compliance in determining greater reasonable progress conflicts with the Supreme Court's recent decision in Michigan v. EPA, 135 S. Ct. 2699 (2015), in which the court held that EPA had improperly ignored costs in developing regulations for hazardous air pollutants from power plants even though the underlying provisions of the Clean Air Act did not expressly mention consideration of costs. While the Justices disagreed on whether or not EPA had in fact considered costs, all nine Justices agreed that EPA could not ignore costs in developing the Clean Air Act regulations in question. As stated by Justice Kagan in her dissenting opinion, "I agree with the majority-let there be no doubt about this-that EPA's power plant regulation would be unreasonable if '[t]he Agency gave cost no thought *at all.*'" Michigan v. E.P.A., 135 S. Ct. 2699, 2714 (2015) (Kagan, J., dissenting) (internal citation omitted) (emphasis in original). Unlike the provisions of the Clean Air Act at issue in the Michigan decision, the visibility provisions of the Clean Air Act expressly require that costs of compliance be considered in determining reasonable progress. 42 U.S.C. 7491(g). And, Utah adequately considered costs when adopting the Revised SIP, requiring EPA's approval. Utah demonstrated by the clear weight-of-evidence that the costs of compliance of the Utah BART Alternative are lower than the costs of compliance of BART, and therefore, achieves greater reasonable progress than BART from a cost perspective. EPA is required by law to consider the costs of compliance in determining greater reasonable progress. EPA's proposal to find that the cost differential is not material and to give no weight to costs in evaluating whether Utah has shown that the Utah BART Alternative achieves greater reasonable progress is contrary to the Clean Air Act and the holding in Michigan v EPA, and is otherwise arbitrary and capricious. EPA must find that the lower cost impact of the Utah BART Alternative weighs in favor of the Utah BART Alternative achieving greater reasonable progress than BART and the proposed FIP.

Response: This comment is addressed elsewhere in Section 1.j.i.

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[36] Environmental Protection Agency, Approval, Disapproval and Promulgation of Air Quality Implementation Plans; Partial Approval and Partial Disapproval of Air Quality Implementation Plans and Federal Implementation Plan; Utah; Revisions to Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze, 81FR2024, (January 14, 2016).

[37] The Clean Air Act also mandates that costs of compliance be taken into account in determining BART. 42 U.S.C. 7491(g)(2).

Comment: [UPHE, p. 15] Since Utah's DAQ has chosen to accept the status quo regarding PacifiCorp's NO_x emissions, and to label that the status quo an "alternative regional haze reduction plan," one would think that the DAQ would want to have a pretty compelling reason for passing up the chance to reduce NO_x pollution by 87% by requiring the application of Selective Catalytic Reduction (SCR) technology, which has been demonstrated to be reliable, efficient, and cost effective. The reason that Utah's DAQ found compelling was PacifiCorp's estimate that retrofitting its four Utah units that are subject to BART with SCR would require an investment of $680 million.

Response: EPA takes no position on the commenter's characterization of Utah's SIP submission.

Comment: [UPHE, p. 29] Although it cites the potential impact on Utah ratepayers as its main motive in declining to require an 87% reduction in NO_x emissions, DAQ does not attempt to estimate that impact. PacifiCorp's financial data shows that the rate impact would be exceedingly modest. The ability of PacifiCorp to install the best available NO_x control technology without substantially affecting its return on equity or raising rates in its Utah market is evident from the 2014 Annual Report of its parent company (Berkshire Hathaway Energy). Page 44 of that report shows that in 2014, PacifiCorp earned total retail electricity revenue of $2.068 billion. If PacifiCorp were to install the best available NO_x control technology at central Utah fleet subject to BART at an annual cost of $77 million,[38] it would require PacifiCorp to raise additional revenues by 3.7% annually. This implies that the expense of installing SCR technology could be covered by a rate increase of only 3.76% for Utah electricity customers going forward.

Response: As explained elsewhere in section 1.j.i, the total capital cost of controls is not a relevant consideration. However, we acknowledge that this comment supports our final action.

Comment: [UPHE, p. 30] As the EPA notes in its Notice of Proposed Rulemaking, regulators in the other states that PacifiCorp's electric power network serves have been less receptive than DAQ appears to have been to PacifiCorp's plea that installing best available NO_x reduction technology will cause it unwarranted financial hardship or that such technology will be ineffective in reducing haze. Unlike DAQ, regulators in other states are requiring PacifiCorp to spend $770 million to install SCR technology on 863 megawatts of capacity (its Jim Bridger Units 3 and 4, Hayden Units 1 and 2, and its Craig Unit 2). See 2014 Annual Report of Berkshire Hathaway Energy at 55-56.

Response: As explained elsewhere in section 1.j.i, the total capital cost of controls is not a relevant consideration. However, we acknowledge that this comment supports our final action.

Comment: Furthermore, citing subsection (1) of Section 169 of the CAA which addresses the cost of compliance. Requiring $700 million of upgrades based primarily on numeric modeling is inadequate. Keeping in mind that all models only a 'prediction' or 'best-guess', it's inappropriate

[38] Annual operating costs would increase as well, but these are usually a small fraction of the capital costs of installing advanced pollution control systems such as Selective Catalytic Reduction.

for the EPA to require the State to implement a plan based on a limited 'best-guess' that would only provide minimal improvements.

Response: We disagree with this comment and note that the BART Guidelines specify that states and EPA must in most cases rely on air quality modeling in determining what measures constitute BART.[39] Additionally, as explained elsewhere in section 1.j.i, the total capital cost of controls is not a relevant consideration.

Comment: With this in mind, the rate-payers of Utah are forced to foot the bill for $700 million dollars for an assumed improvement that is not even perceptible to the human eye and has ZERO impact on human health!

Response: As explained elsewhere in this document, the total capital cost of controls is not a relevant consideration.[40] We also disagree that the emission reductions associated with our FIP measures would not result in perceptible visibility improvement. However, even if this were the case, the regulations do not require that the improvement anticipated to result from a particular technology at a particular source be perceptible by a single human being in order to be relevant as part of a BART determination or a better-than-BART evaluation. On the contrary, the BART Guidelines explain that: ''Even though the visibility improvement from an individual source may not be perceptible, it should still be considered in setting BART because the contribution to haze may be significant relative to other source contributions in the Class I area. Thus, we disagree that the degree of improvement should be contingent upon perceptibility. Failing 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.''[41] This principle also applies in the context of assessing greater reasonable progress –visibility improvements than are less-than-perceptible nonetheless contribute to reasonable progress and thus should be considered when comparing BART with a BART Alternative.

Additionally, we disagree with the commenter that our action will not have an impact on human health, as we expect some health benefits will be associated with the significant reductions in $PM_{2.5}$. However, we did not take these effects into account in our decision because they are outside the scope of the regional haze program.

Comment: I would like to see a cost/benefit analysis of the proposed SCR installation. Is this truly the best use of nearly ¾ of a billion dollars?

Response: As explained elsewhere in section 1.j.i, the total capital cost of controls is not a relevant consideration. In determining what control technology constitutes BART in the context of a FIP, EPA assesses the cost effectiveness of measures by calculating the average and incremental cost per ton of emission reductions. In this case, we determined that the cost of the BART FIP controls is reasonable.

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[39] 40 CFR pt. 51, app. Y, IV.D.5.
[40] Nonetheless, we note that EPA's own revised estimate of the total capital cost of controls is $517 million. The basis for this estimate is explained elsewhere in this RTC document.
[41] 70 FR 39129 (Jan. 30, 2014).

Comment: [UPHE, p. 15] DAQ's memorandum supporting its amended SIP shows little recognition that there is another side to the economic analysis. Earlier in these comments, UPHE performed a back-of-the-envelope analysis of the cost of these BART retrofits based on the EPA's cost estimates. That analysis estimates an annual net additional cost over the 20-year life of those retrofits of just under $77 million. As the National Park Service notes in its April 2, 2015 comments on the amended SIP, tourism in the "Big 5" national parks whose air is polluted by PacifiCorp's central Utah coal fleet adds $750 million in tourist dollars to Utah's economy each year. This is nearly ten times the cost annual cost of applying BART NO_x reductions to PacifiCorp's coal fleet. The National Park Service's comments recognize that the only thing that allows these national parks to be appreciated by the traveler as breathtaking natural wonders rather than desolate wastelands is the chance to view them under clear air and blue skies.

Response: As previously stated, we agree that there are potential positive benefits to the local and national economies in our proposal and we do expect that improved visibility would have a positive impact on tourism-dependent local economies. Regarding the commenter's figure of $77 million for an annual net additional cost over the 20-year life of the BART retrofits, we point the commenter to section 4 and the FRN for responses regarding EPA's revised cost analysis.

2. BART Alternative Demonstration

a. Overarching Comments on BART Alternative Demonstration

Comment: [UDAQ-HT, p. 14; UDAQ, pp. 1-2] Preserving and improving visibility at our national parks is very important to the State's economy and aligns with Utah's commitment to responsible stewardship practices. Utah has been diligently developing its RH SIPs for over a decade because this is a priority for the state and its citizens. The BART Alternative submitted by Utah is just the latest piece of a comprehensive strategy developed to address regional haze. The State provided the history of its Visibility Protection Program and Regional Haze SIP from the early 1980s to present including Utah's early efforts with the Grand Canyon Visibility Transport Commission.

Response: We acknowledge the commenter's explanation of Utah's past efforts on developing its regional haze SIPs that met elements of the RHR that are different from those covered by this action.

Comment: [UDAQ-HT, p. 17; UDAQ, p. 4] The current control strategies in the State's RH SIP have improved visibility at Federal Class I areas in the state and have also benefitted Class I areas outside of Utah that might be impacted by emissions from Utah, and met all requirements of the first planning period. The emission reduction strategies in Utah's RH SIP have been implemented and have been effective.

Response: We acknowledge the commenter's general assessment that Utah's efforts and control strategies thus far have improved visibility at Federal Class I areas, however, we disagree that Utah has met all of the CAA's BART requirements of the first planning period. Our disagreement on this point is further discussed elsewhere in our responses to other comments in this document and in the FRN.

Comment: [UDAQ-HT, p. 17; UDAQ, p. 4] The State of Utah has developed The Utah Smoke Management Plan which provides operating procedures for federal and state agencies that use prescribed fire, wildfire, and wildland fire on federal, state and private wildlands in Utah.

Response: While we acknowledge Utah's past efforts on developing a Smoke Management Plan, we note that Utah's the Smoke Management Plan was submitted as part of the State's prior regional haze SIP and therefore is not part of the State's RH SIP submittal evaluated in this action.

Comment: [UDAQ-HT, p. 17; UDAQ p. 4] Mobile NO_x emissions have decreases state-wide in line with the level of reductions noted in the four main urban counties (Weber, Davis, Salt Lake, and Utah) where emissions are projected to decrease 42,000 tons/year or 61% by 2018 from 2002 levels. It's important to point out that even greater emission reductions will be achieved by 2018 than had been anticipated in Utah's RH SIP due to federal Tier 3 fuel and vehicle standards that were adopted in 2014. The alternative to BART measures included in the proposed revision to Utah' SIP will have decreased S02 emissions by 27,947 tons and NO_x emissions by 15,258 tons from the 2002 inventory by 2015.

Response: While we acknowledge Utah's assessment of mobile sources NO_x emissions in the state, we note that mobile source emissions are not a part of the State's RH SIP submittal evaluated in this action. Specifically, the SIP submittals at issue here address the statutory requirement that states address specific types of stationary sources of emissions of visibility impairing pollutants. Additionally, as explained in the FRN and in this document, in our evaluation of the BART Alternative against the BART Benchmark, we considered the visibility impacts from the SO_2 and NO_x emission reductions during this planning period.

Comment: [UDAQ-HT, p. 18, UDAQ, p. 4] The GCVTC set a goal of achieving 10 percent of electrical generation from renewable resources by 2005 and 20 percent by 2015. Significant progress has been achieved towards meeting this regional goal. Thirteen percent of electricity generation in Utah was from renewable resources in 2012 and significant new resources are currently under construction.

Response: While Utah indicates the State has made progress towards meeting the renewable energy goals established by the GCVTC, as explained in the FRN and elsewhere in this document, the record lacks information on whether the State's progress towards meeting those goals impacted emissions of visibility-impairing pollutants under the BART Alternative. For example, it is unclear whether the Carbon Plant retirement resulted in increased emissions and visibility impairment at the affected Class I areas, or if renewable energy resources accommodated the shift in generating capacity as a result of the retirement. Therefore, as discussed elsewhere in the FRN, because the record lacks information on these and related questions, there is additional uncertainty as to whether the BART Alternative is better than BART.[42]

[42] While the State's 309 regional haze SIP contains renewable energy goals, we note that the BART Guidelines indicate that "[w]e do not consider BART [and a BART alternative] as a requirement to redesign the source when

Comment: [NPS, p. 2] For the reasons summarized below and detailed in the enclosed technical comments, we believe that UDAQ has not satisfied regulatory requirements or complied with regulatory intent. If EPA approved this alternative, it would be accepting a lower standard for BART in Utah than already approved in Arizona, Colorado, and Wyoming.

Response: We agree with the commenter that Utah's BART Alternative does not satisfy its regulatory obligations under the CAA and RHR and that the requirements promulgated with EPA's FIP are necessary to address deficiencies in the Utah's SIP. See our responses elsewhere for more detailed discussion. Regarding the point of potentially accepting a lower standard by approving the State's BART Alternative, EPA evaluated the Utah BART Alternative against the CAA and RHR provisions (which include both the BART Benchmark and the BART Alternative, and as discussed elsewhere in this action, took into consideration our prior determinations, including those mentioned by the commenter), found that the Alternative does not meet the BART alternative requirements, and thus we have not approved the Alternative.

Comment: [NPS, pp. 2-3] UDAQ has not met the fundamental requirement of Section 51.308(e)(2)(i)(E) for a BART Alternative to provide:

> *"[A] clear weight-of-evidence that the trading program or other alternative measure achieves greater reasonable progress than would be achieved through the installation and operation of BART at the covered sources." [emphasis added]*

UDAQ applied the CALPUFF dispersion model to determine the visibility benefits of BART controls and the proposed BART Alternative and presented several metrics to evaluate the model results. We also modeled UDAQ's BART scenario and BART Alternative to evaluate UDAQ's conclusions. Our technical analyses are enclosed with these comments. The primary metric recommended by EPA in Appendix Y of the BART Guidelines[43] is the impact on the 98th percentile day (8th highest day) in each of three modeling years. For both UDAQ and the NPS modeling, the 98th percentile metric favors the BART scenario. While EPA has sometimes used the number of days with impacts greater than 0.5 dv, this metric is imprecise as it does not describe the magnitude of the impact. The remaining measures cited by UDAQ have never previously been approved by EPA in a weight-of-evidence analysis and should not be approved in this application. UDAQ has not provided a clear weight-of-evidence supporting the BART Alternative.

Response: We agree in part and disagree in part with this comment. We agree with the commenter that for the State and NPS modeling, the 98th percentile CALPUFF results favors the BART Benchmark. While we do not consider metrics unrelated to impacts on visibility, we do not agree that we should not consider visibility measures (metrics) considered by the State in evaluating its weight-of-evidence analysis. We therefore considered all the State's metrics that

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considering available control alternatives." 71 FR 39164.Therefore, our uncertainty concerns as to whether Utah's BART Alternative is better than the BART Benchmark, is related to shifts in electrical generation capacity as a result of the Carbon retirement and emission shifting, and not a requirement for a SIP to include measures to transition to renewable energy beyond the scope of what the CAA and RHR requires.

[43] Appendix Y to 40 CFR Part 51 - Guidelines for BART Determinations under the Regional Haze Rule.

relate to visibility impacts, although we assigned those metrics varying weights depending on how relevant they are to assessing whether the BART Alternative makes greater reasonable progress than BART.

Comment: [NPS-TC, p. 1] Even if we take UDAQ's results at face value, the BART Alternative does not show the "clear weight-of-evidence" that it provides greater reasonable progress than BART, as required by § 51.308 (e)(3)(E).

Application of EPA's "key metric," the average of the 98th percentile impacts, favors selection of BART.

Despite EPA's assertion that it intends to be "consistent with our actions elsewhere" in previous regional haze rulemakings, EPA accepted metrics that it had previously rejected elsewhere.

UDAQ's BART Alternative trading program neither "include(s) all sources within a source category," nor does it "…apply to all stationary sources…" as suggested by the 2006 Alternative BART rule.

Response: The response to this comment is provided in the FRN.

Comment: [UDAQ-HT, p. 22; UDAQ, p. 5] EPA should approve the option that UT developed in close consultation with EPA and not the option that UT was not even aware was being prepared or under consideration until it was signed by the Regional Administrator. UT worked closely and in good faith with the EPA and the FLMs to evaluate and implement the appropriate controls for improving visibility. Up to the point of the current proposal, the EPA has indicated to UT that the alternative to BART approach and analysis were acceptable. During the RH SIP development process, Utah and EPA worked as regulatory partners – Utah working closely and extensively with EPA's staff to ensure that Utah's BART Alternative was approvable. EPA's concurrence with Utah's RH SIP proposal is also supported by EPA's comments submitted during the state rulemaking public comment period on the current revision of the Utah's RH ISP. EPA did not point to any substantive flaws in Utah's RH SIP, but only requested minor clarifications and revisions in its 3-page comment letter.

Response: The response to this comment is provided in the FRN.

Comment: [UDAQ, p. 7] To be approved by EPA, a BART alternative must satisfy the following elements: (1) a demonstration that the alternative measure "will achieve greater reasonable progress than have resulted from the installation and operation of BART at all sources subject to BART in the State and covered by the alternative program;" (2) a requirement that "all necessary emission reductions take place during theperiod of the first long-term strategy for regional haze;" and (3) a demonstration that "the emission reductions resulting from . . . [the] alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements In the current proposed rule, EPA correctly found (and Utah concurs) that Utah's RH SIP submission for BART Alternative meets the second and third requirements of Section 308. *See* 81 Fed. Reg. at 2025-2026, 2032. The first elementis at issue here, as EPA's analysis

under each co-proposal differs considerably, contains internal contradictions, creates new inapplicable requirements, and erroneously dismisses certain elements as immaterial.

To satisfy the first requirement of greater reasonable progress, the states must include the following in their SIP proposal: (1) a list of all BART-eligible sources within a state; (2) a list of all BART-eligible sources and all BART source categories covered by the alternative program; (3) an analysis of BART and associated emission reductions; (4) an analysis of the projected emission reductions achievable through the alternative program; and (5) a determination that the alternative program achieves greater reasonable progress than would be achievable through BART. See 40 C.F.R. § 51.308(e)(2)(i)(A)-(E). In the current proposed action, Utah concurs with EPA's finding that Utah's RH SIP meets the first four elements. See 81 Fed. Reg. at 2021, 2027-2028. Therefore, Utah focuses its comments on why EPA should find that Utah's RH SIP submission for BART Alternative demonstrates that the alternative program achieves greater reasonable progress than would be achievable through source-specific BART.

Response: The response to most of the statements in this comment is provided in the FRN and in this document. First, we disagree that EPA lacked authority to present both potential courses of action. As we explained in our proposal and in this final action, our evaluation of the information before us at the time of proposal presented a close call, and in order to provide a fair and meaningful process for all members of the public we used the co-proposal approach, which logically lead to differences in presentation in the notice. We recognized that the information before the Agency was possibly susceptible to both interpretations, and therefore presented the two proposed conclusions and courses of action. Moreover, given the nature of the co-proposals (i.e., one that determined the State's submittal met the better than BART standard, and the second that the State's submittals fell short of meeting the better than BART standard), one would fully expect the two proposals would contain different approaches to meeting the CAA requirements. Second, we disagree with the commenter's suggestion that we have created "new inapplicable requirements." Our evaluation of the State's SIP and record before us and our final determinations are based on the RHR and CAA requirements. Moreover, because we determined the State's submittal falls short of the requirements, we are required to promulgate a FIP to fill the gap. Finally, we disagree that we have erroneously dismissed any elements. As discussed in the FRN, as provided under our RHR, we considered the strengths and weaknesses of all the State's metrics that provide information about visibility impacts.

Comment: [Conserv Orgs – Gray Report, p. 3] In section VI of its co-proposal, EPA evaluated the weight-of-evidence, using all nine categories of evidence, with the most weight given to the visibility impacts based on air quality modeling. Using this more-sensible (and defensible) weighting of the evidence, EPA concluded that Utah's demonstration does not show by the clear weight-of-evidence that the BART Alternative would achieve greater reasonable progress than would be achieved through the installation and operation of BART.

Response: We agree in part. We evaluated the categories of evidence that provide information about visibility impacts and did not consider evidence from evidence that did not provide visibility information. As discussed in the FRN and this document, we agree that it is appropriate to give the most weight to the visibility impacts (e.g., the 98th percentile CALPUFF results) based on air quality modeling.

Comment: [Conserv Orgs – Gray Report, p. 20] One of the two criteria that must be met to demonstrate that the BART Alternative plan achieves greater reasonable progress than the BART Benchmark is that visibility does not decline in *any* Class I area. The metrics presented above show that under the BART Alternative plan, visibility would, in fact, decline in at least one Class I area (using almost any reasonable weighting of the metrics, one would conclude that the modeled visibility impacts are greater for the BART Alternative plan at both Canyonlands NP and Capitol Reef NP).

Response: We disagree with this comment. The commenter quotes the two-prong test for "greater reasonable progress" under 40 CFR 51.308(e)(3). That test does not apply here because the State is attempting to make weight-of-evidence demonstration under 40 CFR 51.308(e)(2)(i)(E), rather than a demonstration under the two-prong test in 40 CFR 51.308(e)(3). Moreover, while this "no degradation" principle may be relevant in determining whether a state has demonstrated that its alternative program achieves greater reasonable progress using a weight-of-evidence analysis, this issue is not raised by the facts before us in this rulemaking. The modeling the State provided does not indicate that visibility worsens at any Class I area relative to the base case. We acknowledge that the commenter provided additional modeling results that are based on different emission scenarios than used by the State.[44] However, we did not rely on these modeling results in reaching our final determination, and take no position on their validity here. Under the facts on which we based our final disapproval, visibility does not decline at any of the affected Class I areas relative to the base case.

Comment: **[Conserv Orgs – Gray Report, p. 22]** The modeled combined emissions (all species) for the BART Alternative scenario are 8,761 lb/hr. For the BART Benchmark, the modeled combined emissions are 10,310 lb/hr. Although the BART Alternative scenario has 1,549 lb/hr lower overall (combined) emissions, the modeling results clearly do **not** show that the visibility impacts for the BART Alternative plan are "better than BART."

The modeling results show that the large emission reductions at the Carbon facility are responsible for some visibility improvement, particularly at Arches NP and Flat Tops Wilderness. However the increase in NO_x at Hunter and Huntington outweighs the effect of the SO_2 reductions at almost all the other Class I areas.

The modeled emissions have distinctly different impacts depending upon where those emission originate, even for sources that are within 60 km of one another.

Response: We agree with the commenter that the annual emissions comparison metric in Utah's weight-of-evidence analysis does not show the BART Alternative is better than the BART Benchmark. Our response to the annual emissions comparison between the BART Alternative and the BART Benchmark can be found elsewhere in this document.

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[44] This comment pertains to the State's modeling results. *See* Comments on EPA's Co-Proposal for the State of Utah Regional Haze State Implementation Plan, Dr. H. Andrew Gray, Gray Sky Solutions, p. 22, March 14, 2016, Docket ID EPA-R08-OAR-2015-0463-0158.

Our position, based on a general review of topographical and typical meteorological conditions in this case and the modeling results, is that Utah's assessment that the distribution of emissions would not be "substantially different under the BART Alternative", is reasonable.[45] The three plants (Hunter, Huntington and Carbon) are all located within 40 miles of each other in Central Utah and are therefore similarly situated to the affected Class I areas. Commenters provide no evidence to suggest otherwise.

Comment: **[Conserv Orgs – Gray Report, p. 24]** If the actual maximum daily SO_2 emission levels from the Carbon facility would have been somewhat lower in the future than the assumed 2012 levels, then that would reduce the modeled visibility impact associated with the BART Benchmark scenario. I used Utah's CALPUFF modeling to demonstrate the sensitivity of the modeled metrics, and showed that even a small reduction in the assumed SO_2 emission rate will have a significant effect on the comparisons between Utah's BART Alternative scenario and BART Benchmark scenario.

Response: There is potential that a small reduction in the SO_2 emission rate could have an impact on the comparison of the BART Alternative to the BART Benchmark. However, there is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [EE, pp. 5-6] The Utah SIP's weight-of-evidence approach finds that the BART Alternative delivers greater visibility benefits than direct application of BART on the units. *See* 81 *Fed. Reg.* at 2016-18. The Utah SIP's BART Alternative will result in greater aggregate emissions reductions of all pollutants, including far greater SO_2 emission reductions in all seasons. Importantly, the BART Alternative reduces sulfate emissions, which is the largest contributor to visibility impairment at the affected Class I areas. In addition, the state's air quality modeling results show that the BART Alternative yields significantly fewer days with impacts above 0.5 deciviews and fewer overall days with impacts above 1 deciview; the BART Alternative yields greater reasonable progress in annual average deciview impacts; and the BART Alternative yields greater reasonable progress in 90th percentile deciview impacts. The BART Alternative also provides visibility benefits throughout the year and a significantly earlier start to emission reductions. EPA challenges several of the weight-of-evidence indicators from the Utah SIP, but it is important to note that differences of only one or two tenths of a deciview, because of computer model limitations, are so uncertain as to raise questions about EPA's criticism of these data.

Response: The response to this comment is provided in the FRN. Additionally, for the reasons stated in the FRN and elsewhere in this RTC document, our evaluation of the State's metric is entirely consistent with our RHR and the CAA. The BART Alternative rule allows states to pursue an alternative to the CAA BART requirement but requires that the alternative program must "clearly" be better than BART, which we have explained is "when there is confidence that

[45] Utah Staff Report at 31.

the difference in visibility impacts between BART and the alternative scenarios are expected *to be large enough*"[46] to ensure that that the alternative is, in fact, better. Therefore, as part of our review of Utah's SIP we evaluated whether the differences in visibility impacts between BART and the State's BART Alternative are "large enough" to satisfy the *clear* weight-of-evidence requirement. Additionally, the burden is on the state - - not EPA - - to demonstrate that the alternative measure achieves greater reasonable progress.[47] Therefore, EPA's evaluation of the State's data and final determinations are consistent with the CAA and RHR requirements.

Comment: [EE, pp. 6-7] The Utah SIP's SO_2 reductions are crucial to visibility improvement—far more so than nitrogen oxide (NO_x) reductions—and they are very substantial. EPA acknowledges that the "combined emissions of NO_x, SO_2 and PM_{10}" under the BART Alternative "will be 2,856 [tons per year (tpy)] lower" as compared to direct application of BART. *See* 81 *Fed. Reg.* at 2022. EPA also agrees that the more than 8,000 tpy of SO_2 emission reductions under the BART Alternative will have a greater impact on improving visibility during more parts of the year than further reductions of NO_x. Thus, EPA proposes "to concur with Utah's finding that SO_2 emissions reductions should provide visibility benefits in all seasons and that sulfate is the largest contributor to visibility impairment at the affected Class I areas." *See id.* Under the BART Alternative, any potential adverse impact to visibility caused by a smaller decrease of NO_x emissions (compared to the direct application of BART) is overwhelmed by the increased visibility benefits of the combined overall emission reductions. Accordingly, the BART Alternative delivers appropriate and significant overall visibility benefits, regardless of any pollutant-by-pollutant assessment of emissions reductions. Because the goal of the regional haze program is to reduce man-made visibility impairments in Class I areas, EPA should not consider disapproving a BART Alternative that produces superior visibility impairment mitigation. Further, the BART Alternative already has produced SO_2 emission reductions from 2008 to the present. Also notable is that combustion control upgrades at the Hunter and Huntington facilities have been achieving significant NO_x reductions since the time of their installation between 2006 and 2014.[48]

Response: Our position on the importance of SO_2 emissions reductions in relation to NO_x reductions as well as our evaluation of Utah's metrics in its greater reasonable progress than BART analysis for the timing of emissions reductions, the evaluation of annual aggregate emissions, consideration of seasonality and visitation at the Class I areas, are provided elsewhere in this document and in the FRN.

Comment: [PacifiCorp, p. 11] EPA properly notes that "Utah has opted to establish an alternative measure (or program) for NO_x in accordance with 40 CFR 51.308(e)(2)." As described in the table above, the Applicable BART Alternative Requirements are straightforward, and EPA properly proposes to conclude that the Utah SIP complies with them.

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[46] 71 FR 60622 (Oct. 13, 2006) ("In showing that an alternative program is better than BART and when there is confidence that the difference in visibility impacts between BART and the alternative scenarios are expected *to be large enough*, a weight of evidence comparison may be warranted in making the comparison." (emphasis added)
[47] 64 FR 35741 (July 1, 1999).
[48] *See* "Public Hearing in Salt Lake City UT on 1.26.16: Transcript," pp. 23-24, included in Docket No. R08-OAR-2015-0463.

See 81 FR at 2021-27. Although PacifiCorp supports EPA's proposed conclusion,[49] it disagrees with some reasons applied by EPA in reaching that conclusion. PacifiCorp believes that applying proper reasoning will strengthen EPA's conclusion that the BART Alternative under the Utah SIP demonstrates greater reasonable progress.

Response: Our reply regarding the reasons that were applied to reach our proposed conclusion are discussed elsewhere in this action.

Comment: [PacifiCorp, p. 13] *Greater Reasonable Progress* The crux of approving a BART Alternative is determining that it produces greater reasonable progress than BART. See 40 CFR 51.308(e)(2)(i)(e). Indeed, upon evaluating certain evidence[50] in regard to the Utah SIP, EPA properly proposes: (i) "to find that the BART Alternative is likely to achieve greater reasonable progress;" and (ii) "to approve Utah's determination that the Utah BART Alternative would achieve greater reasonable progress than BART…." See 81 FR at 2022 and 2025. EPA should take final action consistent with this proposal.[51]

Response: EPA disagrees with this comment. As we explained in our proposal, in order to approve the State's SIP submission "EPA must be able to find that the state plan is consistent with the requirements of the Act." 81 FR 2004, 2006 (Jan. 14, 2006). The proposal made clear that EPA was proposing two mutually exclusive conclusions and courses of action: "(1) The State's submittal meets the [greater reasonable progress test] and we approve the BART Alternative; or (2) the State's submittal falls short of meeting this test and we disapprove the BART Alternative." *Id.* As detailed in section I.B.1 in the FRN and Sections 1 and 2 of this document, we were unable to find that Utah's BART Alternative achieves greater reasonable progress than BART under a weight-of-evidence analysis. Therefore, we cannot finalize the proposal to approve the State's BART Alternative and must finalize our proposed disapproval.

Regardless of the nature of a State's proposed BART Alternative, EPA cannot approve that Alternative unless the State has demonstrated, using a technically acceptable approach, that it will achieve greater reasonable progress than BART. 79 FR 33438, 33440–41. It is thus irrelevant that EPA has approved or proposed to approve BART Alternatives that include inter-pollutant trading in the past.

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[49] As noted above, this conclusion is the end of EPA's authority to review the Utah SIP because 42 U.S.C. §7410(k)(3) requires EPA to approve the SIP Proposal given that it meets all Applicable BART Alternative Requirements.

[50] EPA described the clear weight-of-evidence standard as follows: "'Weight-of-evidence'" demonstrations attempt to make use of **all available information and data** which can inform a decision while recognizing the relative strengths and weaknesses of that information in arriving at the soundest decision possible. Factors which can be used in a weight-of-evidence determination in this context may include, but not be limited to, future projected emissions levels under the program as compared to under BART, future projected visibility conditions under the two scenarios, the geographic distribution of sources likely to reduce or increase emissions under the program as compared to BART sources, monitoring data and emissions inventories, and sensitivity analyses of any models used." (Emphasis added.) See 71 FR 60612, 60622 (Oct. 13, 2006); Compare 81 FR at 2011-12.

[51] Similarly, EPA has approved, or proposed to approve, other BART Alternatives that include "inter-pollutant trading" when SO2 levels were lower. 79 FR 33438, 33440-41 (Washington, June 11, 2014); 79 FR 56322, 56328 (Arizona, Sept. 19, 2014).

Comment: [PacifiCorp, p. 1] PacifiCorp strongly encourages EPA to approve Utah's BART Alternative, thereby guaranteeing "reasonable progress" towards Utah's regional haze goals in a cost-effective manner.

Response: We disagree with this comment and have provided detailed responses regarding our final determination that Utah's BART Alternative does not clearly demonstrate greater reasonable progress than BART based its weight-of-evidence analysis including the State's cost metric elsewhere in this document and in the FRN.

Comment: [PacifiCorp, p. 5] Utah considered all of the applicable metrics and evidence and, under the weight-of-evidence analysis, easily determined that the BART Alternative produces greater reasonable progress than the BART Benchmark[52] at the Utah BART Units.

Response: Our response on Utah's BART Alternatives producing greater reasonable progress than the BART Benchmark is provided in the FRN and elsewhere in this document.

Comment: [PacifiCorp, p. 61] PacifiCorp requested EPA incorporate by reference its prior December 22, 2014 comment letter[53] addressed to the State of Utah into PacifiCorp's current March 14, 2016 comments to EPA. These prior comments include the overarching comment that Utah properly established an "other alternative measure" for NO_x instead of establishing NO_x BART for each of the Units. PacifiCorp provided the following supporting information in addition to other points located elsewhere in this document:

§51.308(e)(2)(i)(C) – Utah properly analyzed the Alternative Measure by comparing it against the most stringent, potential BART controls and limits (by assuming the installation of selective catalytic reduction ("SCR") at a 0.05 lb/MMBtu limit to control NO_x at the Units). *See* Staff Report, Section VI, page 8. This allowed Utah properly to determine that the Alternative Measure provides greater reasonable progress against the most stringent, potential BART controls and limits. It is worth noting that several environmental groups agreed, in comments to the September 2014 proposed amendment by Utah to its regional haze SIP, that SCR with a NO_x emission rate of 0.05 lb/MMBtu is appropriate as BART. *See* December 22, 2015 letter to Utah by HEAL Utah, National Parks Conservation Association, and Sierra Club at Section V.D. (pages 27 – 30).[54] EPA has used a 0.05 lb/MMBtu NO_x emissions rate for SCR for other regional haze SIP analyses, recently in New Mexico and Arizona. *See e.g.*, 79

[52] According to EPA, the term "BART Benchmark" means "an analysis of the best system of continuous emission control technology available and the associated reductions for each source subject-to-BART covered by the alternative program…." See 81 FR at 2011. EPA sometimes uses this term in the FIP Proposal to mean requiring LNB, OFA and SCR as BART for NO_x at each of the Utah BART Units, and without conceding EPA is correct, PacifiCorp refers to BART Benchmark herein in the same manner.

[53] EPA notes that the corrected version of the 2014 letter submitted to EPA as part of PacifiCorp's comments is undated.

[54] As demonstrated in PacifiCorp's numerous BART analyses submitted to the Division, SCR is not "BART" for any of the Units. However, SCR is a potential NO_x emissions control that must be analyzed in a five-factor BART analysis, and is the most "stringent" NO_x control that was studied as part of the previous five-factor BART analyses.

Fed. Reg. 60,978, 60, 984 (New Mexico, Oct. 9 2014)("In promulgating the FIP, we evaluated the performance of both new and retrofit SCRs and determined that 0.05 lb/MMBtu on a 30-boiler-operating-day average was the appropriate emission limit for SCR at the San Juan Generating Station units. See 76 FR 491 and 76 FR 52388. New Mexico appropriately used this same rate in their cost and visibility analyses for the four-SCR scenario as part of its BART evaluation."); 79 Fed. Reg. 52,420, 52,431 (Arizona, Sept. 3, 2014)("We agree that our use of a 0.05 lb/MMBtu annual average design value for SCR is consistent with other BART determinations for coal-fired power plants.").

EPA has agreed that even higher NO_x emission rates can qualify as the most stringent emission rate for modeling visibility impacts. For example, EPA accepted state-mandated SCR emission rates of 0.07 and 0.08 in Colorado, as well as its SCR related analyses based on 0.07. 77 Fed. Reg. 76,871 (Colorado, Dec. 21, 2012). EPA also used 0.083 to 0.098 for the Reid Gardner Station in Nevada. 77 Fed. Reg. 50,936, 50,942 (Nevada, Aug. 23, 2012). Assuming, as Utah concluded in its prior RH SIP, that NO_x BART for each Unit is Low NO_x Burner/Over-fire Air (LNB/OFA) with an emission limit of 0.26 lb/MMBtu,[55] the Alternative Measure also results in greater reasonable progress than that assumption. This is because achieving greater reasonable progress as against the most stringent NO_x technology and limits, by definition, demonstrates even greater reasonable progress as compared against less stringent technology and limits. The same is true by comparing the Alternative Measure against presumptive NO_x limits in Appendix Y, and PacifiCorp's BART analyses referenced in Footnote 1 and included in SIP record.

All of the above confirms that, by comparing the Alternative Measure against the most stringent potential NO_x BART controls and limits, Utah properly demonstrates that the Alternative Measure results in greater reasonable progress.

§51.308(e)(2)(i)(D) – Utah properly conducted an analysis of the projected emission reductions achievable through the Alternative Program. *See* Staff Report, Section VII, page 9.

§51.308(e)(2)(i)(E) – Finally, Utah properly analyzed the Alterative Measure using the qualitative (or clear weight-of-evidence) standard and determined that the Alternative Measure achieves greater reasonable progress than would be achieved through the installation of BART, even with the most stringent possible NO_x technology and limit. *See* Staff Review, Section VIII, pages 10 – 18.

EPA[56] described the clear weight-of-evidence standard as follows:

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[55] PacifiCorp suggests that Utah remove the word "existing" from SIP Section XX.D.6.c because the "existing" technology referred to by Utah no longer exists. This is because, as noted in the Staff Review at page 4, the first generation LNB technology already has been replaced with Alstom TSF 2000TTM LNBs, including the installation of two elevations of separated overfire air, which results in even greater NO_x emission reductions.

[56] EPA recently confirmed the availability of the "other alternative measure" based on the "clear weight of evidence" approach in approving a "BART Alternative" under the Arizona regional haze state implementation plan. 80 Fed. Reg. 19220 (April 10, 2015).

> "Weight-of-evidence" demonstrations attempt to make use of all available information and data which can inform a decision while recognizing the relative strengths and weaknesses of that information in arriving at the soundest decision possible. Factors which can be used in a weight-of-evidence determination in this context may include, but not be limited to, ***future projected emissions levels*** under the program as compared to under BART, ***future projected visibility conditions*** under the two scenarios, ***the geographic distribution of sources*** likely to reduce or increase emissions under the program as compared to BART sources, monitoring data and emissions inventories, and sensitivity analyses of any models used. (Emphasis added.) *See* 71 Fed. Reg. 60,612, 60,622 (Oct. 13, 2006).

Response: As discussed in the FRN and elsewhere in this document, we partially agree with this comment. We agree that Utah used a NO_x emission rate that represented the most stringent limit of 0.05 lb/MMBtu for SCR in its BART Benchmark scenario. However, the commenter has confused we disagree with the commenter's assertion that Utah's BART Alternative achieves greater reasonable progress than BART.

EPA cannot approve a state Alternative unless the state demonstrates, using an approach consistent with the requirements, that it will achieve greater reasonable progress than BART. Utah used a 0.05 lb/MMBtu emission rate in the Alternative, and that is what we considered in our evaluation of the Alternative. It is therefore irrelevant that EPA approved other NO_x emission rates in proposed, final, or disapproved[57] BART determinations. The RHR requires that the *BART Benchmark* developed for the BART alternative be used as the yardstick to evaluate whether the Alternative provides greater reasonable progress than BART, rather than other EPA RHR evaluations final actions that took into consideration different rules and facts.

Moreover, the suggestion that the presumptive NO_x limit be used to judge the State's BART Alternative is also irrelevant. In the BART Guidelines EPA explained that:

> For coal-fired EGUs greater than 200 MW located at greater than 750 MW power plants and operating without post-combustion controls (i.e. SCR or SNCR), we have provided presumptive NO_x limits, differentiated by boiler design and type of coal burned. You may determine that an alternative control level is appropriate based on a careful consideration of the statutory factors. For coal-fired EGUs greater than 200 MW located at power plants 750 MW or less in size and operating without post-combustion controls, you should likewise presume that these same levels are cost-effective. You should require such utility boilers to meet the following NO_x emission limits, unless you determine that an alternative control level is justified based on consideration of the statutory factors.

BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.E.5.

Therefore, the presumptive emission limits in the BART Guidelines are rebuttable, and the five statutory factors enumerated in the BART Guidelines provide the mechanism for establishing different requirements. Specifically, as explained in the preamble to the BART Guidelines:

[57] See, e.g., Utah's prior regional haze SIP for NO_x BART, which EPA disapproved.

> If, upon examination of an individual EGU, a State determines that a different emission limit is appropriate based upon its analysis of the five factors, then the State may apply a more or less stringent limit.

70 FR 39132.

Thus, the establishment of presumptive BART limits, and the corresponding technology upon which those limits are based, does not preclude states or EPA from setting limits that differ from those presumptions, which is exactly what Utah did for the BART Alternative in using the most stringent NO_x BART limits.

Additionally, as discussed in the FRN and in this document, while we agree that the State had the option of selecting the weight-of-evidence approach, we disagree that the State properly analyzed the Alterative Measure and disagree that the Alternative Measure achieves greater reasonable progress than would be achieved through the installation of the most stringent controls assumed in the BART Benchmark (which contrary to commenter's assertion, is the appropriate yardstick upon which to evaluate the State's Alternative).

Comment: [PacifiCorp, p. 64] PacifiCorp encouraged Utah to specifically recognize that the Alternative Measure includes "non-BART sources" (i.e., Carbon Unit 1 and Unit 2 (PM, NO_x and SO_2) and Hunter Unit 3 (NO_x)). The Tenth Circuit Court recognized non-BART sources as a legitimate factor to consider in a "weight of the evidence" analysis. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 935-36 (10th Cir. 2014).

Response: We agree that the RHR allows for BART alternative measures to include non-BART sources, as explained elsewhere in this document. Therefore, to the extent the other RHR requirements are met, non-BART sources can be included in a BART alternative.

Comment: [PacifiCorp, pp. 65-66] PacifiCorp noted that by letter dated April 2, 2015 (a copy of which is on file as part of the SIP Revision docket), the National Park Service submitted comments regarding the SIP Revision which are intended "to emphasize the fundamental importance of clean air to the purposes and visitor enjoyment of the five national parks in Utah." In submitting the comment letter, however, the National Park Service mischaracterized the nature of the Alternative Measure as follows: "DAQ has proposed to claim that emission reductions due to the planned closure of the Carbon power plant as an acceptable alternative to BART installation and emission reductions from the Hunter and Huntington plants." As clearly explained in the SIP Revision and noted above, the Alternative Measure does not rely solely on emission reductions from the Carbon power plant. Instead, it consists of: (i) substantial emission reductions associated with the closure of the Carbon plant (non-BART eligible); (ii) early NO_x emission reductions due to upgraded LNB/OFA at Hunter Unit 1 and Unit 2 (BART eligible); (iii) early NO_x emission reductions due to upgraded LNB/OFA at Huntington Unit 1 and Unit 2 (BART eligible); and (iv) substantial NO_x emission reductions due to upgraded LNB/OFA at Hunter Unit 3 (non-BART eligible). *See* Staff Review, p. 6. It is unfair and improper to characterize the entirety of the Alternative Measure as merely reductions associated with the Carbon power plant closure. Moreover, given the extensive explanation in the letter of the

importance of improved visibility at Utah's national parks, the National Park Service should be pleased with – not critical of – the Alternative Measure because it provides even greater reasonable progress than would be achieved by assuming the most stringent NO_x controls (SCR) and limits. In other words, Utah is proposing the very "strong action" that the National Park Service is asking Utah to do. What Utah cannot do, of course, is require both the Alternative Measure and also the most stringent NO_x controls and limits as BART on the Units.

Response: The EPA acknowledges that National Park Service submitted comments regarding the SIP Revision which were intended "to emphasize the fundamental importance of clean air to the purposes and visitor enjoyment of the five national parks in Utah." The comments regarding the nature of the Alternative Measure are responded to elsewhere in this documents. Finally, we disapproved the Utah Alternative[58] and promulgated a FIP, therefore, our final action requires Utah to do neither.

Comment: [Conserv Orgs, p. 18] Utah's latest Regional Haze SIP fails to require ***any*** new emissions reductions.

Response: The commenter does not cite a legal basis for this comment. We disagree with the comment because, as noted in our proposed action, pursuant to 40 CFR 51.308(e)(2)(iv), the SIP must demonstrate that the emissions reductions resulting from the alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP. The baseline date for regional haze SIPs is 2002,[59] and therefore, emission reductions that occur after the baseline date can be considered in the alternative measure.

Comment: [Conserv Orgs, p. 24] Utah's BART Alternative Does Not Achieve Greater Reasonable Progress Than BART

While EPA has approved alternative programs found to satisfy the regulatory criteria, including the regulatory requirement to achieve "greater reasonable progress" than BART, it has never used an alternative program to exempt all of the state's BART sources from future emission reductions largely in exchange for historical emissions reductions at geographically distinct non-BART sources. If Utah's program were approved, there would be nothing to stop states from attempting to satisfy Regional Haze Rule obligations through historical emissions reductions achieved from implementation of any other federal or state pollution-reduction measure affecting any source in the past. Were it allowed, Utah's approach would gut the Regional Haze Rule's BART requirements depriving Class I areas and their millions of visitors of just visibility improvements mandated by the Clean Air Act.[60]

Response: The responses to these comments are provided in the FRN and elsewhere in this document.

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[58] Additionally, we note that in developing the SIP, Utah selected the most stringent NO_x limits for the four EGUs subject to BART to calculate the BART Benchmark.
[59] 81 FR 2019 (Jan. 14, 2016) and Lydia Wegman Memorandum (docket ID EPA-R08-OAR-2015-0463-0016).
[60] 42 U.S.C. § 7491(b)(2)(A).

Comment: [Conserv Orgs, p. 24] Utah's alternative program must be rejected because it would fail to achieve greater reasonable progress than BART. EPA regulations provide that "greater reasonable progress" demonstrations be based on one of two tests: 1) under 40 C.F.R. § 51.308(e)(3), that "the alternative measure results in greater emission reductions" or greater "overall improvement in visibility" based on modeling than does BART; or 2) under 40 C.F.R. § 51.308(e)(2)(i)(E), that the alternative measure achieves greater reasonable progress based on the "clear weight-of-evidence." Utah's alternative measure fails both tests.

Response: As discussed in our evaluation of Utah's BART Alternative in the FRN, we agree that the Utah alternative measure does not meet the clear weight-of-evidence test, and have not evaluated the measure under the overall improvement test. The response to this comment is provided in the FRN and in this document.

Comment: [Conserv Orgs, p. 25] Utah's alternative program does not comply with the Regional Haze Rule for the basic reason that it is not better than BART.

Response: We agree with this comment. The response to this comment is provided in the FRN and elsewhere in this document.

Comment: [Conserv Orgs, p. 34] When comparing these other BART Alternatives with Utah's BART Alternative, the Arizona Apache BART alternative is most instructive.

Response: The response to this comment is provided in the FRN and elsewhere in this document where we provide examples of other BART alternative SIPs approved by EPA, referencing Arizona and Washington State.

Comment: [Conserv Orgs, p. 35] Accordingly, EPA may not approve Utah's BART Alternative and at the same time remain consistent with its employed methodology for a nearly identical BART Alternative in Arizona.

Response: We agree in part to the extent the facts and rule elements are similar, and the response to this comment is provided in the FRN.

Comment: [Conserv Orgs, p. 42] At a minimum, however, uncertainty regarding appropriate baseline emissions for the Carbon Plant, combined with the model's sensitivity and negligible differences in Utah's modeling comparison between BART and Utah's BART Alternative should preclude any finding that the "clear weight-of-evidence" favors Utah's BART Alternative.[61]

Response: The response to this comment is provided in the FRN.

Comment: [NPS Tech, pp. 12, 16-17] UDAQ results (Table 12 in Fed Reg) indicate that BART is 0.14 dv better across the nine Class I areas than the BART Alternative.

[61] *See id.* at 4, 27.

In its February 13, 2015 "Review of 2008 PM Determination and Recommended Alternative to BART for NO_x," UDAQ presented CALPUFF modeling results in the form of nine different metrics. As part of its proposal to approve UDAQ's BART Alternative, EPA evaluated each metric. We agree with EPA that "this is a complicated analysis" and that EPA should consider "the State's BART Alternative in the context of other previous decisions we [EPA] and the states have made." EPA has stated that it intends to be ***"consistent with our actions elsewhere"*** in previous regional haze rulemakings such as for Arizona, North Dakota, Montana, and Washington—we agree with that principle, and shall discuss, where appropriate, how those examples, and others, apply to Utah. However, if EPA were to approve the Utah BART Alternative, that position would be inconsistent with its approaches in other cases, as we shall discuss below…In fact, the metrics that appear to support the BART Alternative are not appropriate because they have been rejected by EPA in past evaluations or have not been previously used by EPA, or are not statistically valid. We urge EPA not to approve new statistical tests that, in effect, simply "outnumber" those tests that have previously been used by EPA. We do not believe that EPA should be encouraging such an exercise in "creative statistics."[62]

Response: Our responses to these comments are provided elsewhere in this document and in the FRN; and as presented in the FRN, EPA's final action is consistent with our prior actions.

Comment: [NPS Tech, pp. 23-24] The Clean Air Act goal is not limited to improving visibility in general and on average across broad areas. Instead, in order to remedy "any existing impairment," it is necessary to consider the impact of NO_x emissions at specific times and locations as demonstrated by the modeling analysis. As will be shown by an actual modeling analysis that takes into account the fact that "not all pollutants impact visibility equally," EPA's suggestion that "the BART Alternative is *likely* to achieve greater reasonable progress" is not supported by the ultimate test of actual visibility modeling and does not pass the "clear weight-of-evidence" test. EPA should withdraw this statement.

Response: Our responses to these comments are provided elsewhere in this document and in the FRN; and we agree that using the modeling analysis provides: (1) for consideration of impacts in visibility from emission reductions at specific times and locations; (2) for a way to collectively evaluate emission reductions from different pollutants, which is important because not all of the pollutants analyzed in this action impact visibility in the same manner.

Comment: [NPS Tech p. 36]
In evaluating Utah's weight-of-evidence demonstration, EPA says it evaluated all nine elements of Utah's analysis. However, it is our understanding that EPA did not evaluate all of UDAQ's model inputs and results—instead, EPA simply accepted them at face value and we have shown that some of UDAQ's model inputs are improperly biased in favor of its BART Alternative. Nevertheless, EPA relies primarily on the following four elements in proposing to approve the BART Alternative:

[62] A consequence of this EPA approach would be efforts by parties to see who can generate the most statistical tests favoring their position. For example, we could propose that EPA consider the maximum impacts and the 99th percentile impacts (and everything in between) of these alternative scenarios, but we believe it is best to be consistent with past practices so that the "rules of the game" do not change arbitrarily. (FN29 in NPS document).

- Annual emissions comparison for two pollutants;
- Improvement in the number of days with significant visibility impairment;
- IMPROVE monitoring data regarding sulfates; and
- The early timing for installation of controls.

We have shown that EPA's first primary element, annual emissions comparison for two pollutants, is not valid because one pollutant (NO_x) is increasing while another pollutant (SO_2) is decreasing. EPA cannot use this element to support UDAQ's BART Alternative.

Response: UDAQ developed the CALPUFF modeling protocol supporting its BART Alternative in concert with EPA. We disagree that the model inputs are improperly biased in favor of the BART Alternative and have addressed this point in related comments elsewhere. We have evaluated the model results, as they relate to evaluation of Utah's overall weight-of-evidence, and discuss our findings in section I.B.1 in the FRN.

Comment: [UPHE, p. 14] Although DAQ admits that applying Selective Catalytic Reduction technology to the four PacifiCorp units that are subject to BART can be expected to reduce their NO_x emissions by 87%, it brushes this aside as an "uncertain" benefit to visibility at the seven Class 1 air sheds affected by the central Utah (Arches, Canyonlands, Zion, Bryce Canyon, the Grand Canyon, Mesa Verde, and the Black Canyon of the Gunnison).

Response: Comment noted.

Comment: **[UPHE, p. 16]** Utah's own clean air rules recognize this as well in their articulation of the State's basic policy. Utah's Visibility SIP, Section XVII.J says:
The State recognizes that visibility and the ability to see the great scenic views in Southern Utah is a rare and unique treasure and should be preserved, both for the benefit and pleasure of Utah residents, and to support our large tourist industry. In addition to the distance one can see, the clarity, color, and detail of the visible features are also important.
Policy statements are one thing, but implementation is another.

Response: The language quoted by the commenter was removed from Utah's clean air rules by the Utah Air Quality Board at the request of the state legislature in a decision that was approved on March 29, 1993, because the state legislature concluded that the statement was a policy statement and not a rule. 62 Fed. Reg. 17093. The EPA approved moving the provision cited by the commenter from the rule section of the SIP, Utah Administrative Code R307-5, to the Visibility Protection SIP Section 15.10 (now section XVII) explaining "EPA agrees that the above statement represents policy, not regulation, and therefore, the administrative 'housekeeping' action of deleting the language from the Air Conservation Regulations and adding it to the text of the Visibility Protection SIP was appropriate." 62 Fed. Reg. 17094. EPA recognizes this a policy statement. As explained elsewhere in this action evaluates and makes final determinations on the SIP submittal.

Comment: [UARG, p. 4] Utah compared this BART Alternative to a BART Benchmark based on estimated emissions from "the four BART units with combustion controls and SCR [selective catalytic reduction], Carbon's baseline emissions, and Hunter Unit 3's emissions with original

combustion controls" and determined that the Alternative would achieve greater reasonable progress than BART.

Response: Comment noted.

Comment: [UARG, p. 5] EPA should reject its proposed disapproval of the Utah BART Alternative and its proposed FIP.

Response: We disagree that we should reject our proposed disapproval of the Utah BART Alternative and our proposed FIP. Our reasoning for this response is explained elsewhere in this document and record.

Comment: [UARG, p. 5] Utah properly evaluated the available evidence and reasonably concluded that the BART Alternative is better than BART under the weight-of-evidence test.

Response: We disagree with the assessment that Utah properly evaluated the available evidence and reasonably concluded that the BART Alternative is better than BART under the weight-of-evidence test. Our reasoning is explained elsewhere in this document and record.

Comment: [UARG, p. 5] EPA is also correct to propose to determine that the majority of the metrics that Utah considered support a better-than-BART determination.

Response: We disagree with this comment. Our position is explained in greater detail elsewhere in this document and record.

b. Weight-of-Evidence

Comment: [PacifiCorp, pp. 2, 6] Utah's SIP Proposal meets all applicable requirements. Through proper application of each applicable requirement in the regional haze rules, Utah determined – and so did EPA –that the weight of the evidence demonstrates that the Utah SIP Proposal makes greater reasonable progress than installation and operation of BART; and it does so at a substantially lower cost.

At least three different sources document that the SIP Proposal satisfies applicable regional haze requirements: (i) the Utah SIP; (ii) PacifiCorp's comments filed with the state of Utah in support of the Utah SIP (which comments are attached hereto as Attachment 1 and incorporated herein by this reference); and (iii) EPA's SIP Proposal. In general, EPA must approve any SIP, including the Utah SIP, that "meets all of the applicable requirements" of the CAA. See 42 U.S.C. 7410(k)(3).

Applicable BART Alternative Requirements

The Proposed Action properly describes the Utah SIP as "an alternative to BART" for NO_x ("BART Alternative") that Utah adopted "instead of establishing BART controls" at the Utah BART Units. See 81 FR at 2006. The Proposed Action further describes EPA's support for BART alternative plans in general by noting that "the idea of a BART alternative…is a

reasonable one, and one that EPA supports where consistent with the CAA and [regional haze requirements]." Id. In other words, as long as the BART Alternative complies with the CAA and applicable regional haze requirements, EPA is required to accept this approach in lieu of a BART determination.[63]

The Proposed Action also properly describes the evaluation (found generally at 40 C.F.R. 51.308(e)(2)) that EPA must conduct to decide whether to approve the BART Alternative as contained in the Utah SIP:

"(1) '[a] demonstration that the emissions trading program or other alternative measure will achieve greater reasonable progress than would have resulted from the installation and operation of BART at all sources subject to BART in the State and covered by the alternative program'; (2) '[a] requirement that all necessary emission reductions take place during the period of the first long-term strategy for regional haze'; and (3) '[a] demonstration that the emissions reductions resulting from the alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP.'" See 81 FR at 2006.

EPA also properly describes applicable requirements (found generally at 40 C.F.R. 51.308(e)(2) and (3)) for use in determining whether the BART Alternative achieves greater reasonable progress:

"For the first element, the determination that the alternative measure will achieve greater reasonable progress than BART, the State must provide the following: (1) A list of all BART-eligible sources within the State; (2) a list of all BART-eligible sources and all BART source categories covered by the alternative program; (3) an analysis of BART and associated emission reductions; (4) an analysis of the projected emission reductions achievable through the BART alternative; and (5) a determination that the alternative achieves greater reasonable progress than would be achievable through the installation and operation of BART." See 81 FR at 2006.

In addition, 40 C.F.R. 51.308(e)(2) makes clear that it is fully within a state's discretion whether to adopt a BART Alternative. That is, a "State may opt to implement or require participation in an…other alternative measure [i.e., BART Alternative] rather than require sources subject to BART to install, operate and maintain BART."[64] The CAA and the preamble to the BART

[63] Comments that oppose <u>any</u> use of a BART alternative, like those found in Section I of the "July 8, 2015 Conservation Group Letter to EPA Janet McCabe" (EPA ID No. EPAR08-OAR-2015-0463-0029) (the "July 8th Letter"), are not relevant to the issue of whether the BART Alternative meets applicable requirements. EPA should disregard such comments.

[64] Because of this, arguments that Utah should never have considered a BART Alternative are beyond the scope of the Proposed Action and are not relevant. For example, see Section II of the July 8th Letter which argues against the discretion used by Utah in deciding to select a BART Alternative including the following assertions, among others: (i) "Utah eschewed the cost-effective benefits of SCR in favor of a BART 'alternative'… that would require no new emission reductions on any source in the state;" (ii) the Units will "…continue to emit NO_x at current high levels while taking credit for emissions reductions that already have occurred;" and (iii) EPA has "never used an alternative program to exempt all of the state's BART units from controls in exchange for wholly past emissions reductions at non-BART units." These assertions do not attempt to explain why the Utah SIP does not meet applicable regional haze requirements and are nothing more than arguing that Utah should never select any BART Alternative. EPA should disregard such comments.

Alternative rules also make clear that the elements of cost and energy/non-air quality impacts should be considered in the greater reasonable progress analysis. In taking final action, EPA should rely on the above requirements (which together are referred to as the "Applicable BART Alternative Requirements") and approve the Utah SIP.

The Utah SIP Meets the Applicable BART Alternative Requirements

The following table demonstrates that the BART Alternative meets the Applicable BART Alternative Requirements. Very simply, the table lists the Applicable BART Alternative Requirements in the two left-hand columns, and then notes in the two right-hand columns those parts of the Utah SIP that demonstrate compliance with each requirement. EPA is not required to apply any more complicated analysis than this in approving the BART Alternative under the Utah SIP.

Regulation	Summary	Utah SIP	SIP Proposal
308(e)(2)(i)(A)	List all BART eligible sources	**Meets requirement**: 2015 Utah RH SIP, Sec. XX.D.6 (a)-(e).	**Meets requirement**: 81 FR at 2015, 2021
308(e)(2)(i)(B)	List BART eligible sources covered by BART Alternative	**Meets requirement**: 2015 Utah RH SIP, Sec. XX.D.6 (a)-(e).	**Meets requirement**: 81 FR at 2015, 2021
308(e)(2)(i)(C)	Compare BART Alternative To BART	**Meets requirement**: 2015 Utah RH SIP at XX.D.6(c) (including TSD "Staff Review" dated May 13, 2015)	**Meets requirement**: 81 FR at 2015, 2021
308(e)(2)(i)(D)	Project emission reductions	**Meets requirement**: 2015 Utah RH SIP at XX.D.6(c) (including TSD "Staff Review" Table 2 dated May 13, 2015)	**Meets requirement**: 81 FR at 2015, 2021
308(e)(2)(i)(E)	Use "weight of evidence" to determine greater reasonable progress	**Meets requirement**: 2015 Utah RH SIP at XX.D.6(a), (c) (including TSD "Staff Review" dated May 13, 2015)	**Meets requirement**: 81 FR 2016-19 and 2021-24
308(e)(2)(iii)	Emission reduction timing	**Meets requirement**: 2015 Utah RH SIP at XX.D.6(e)	**Meets requirement**: 81 FR 2019, 2025
308(e)(2)(iv)	Surplus reductions	**Meets requirement**: 2015 Utah RH SIP at XX.D.6(c) (including TSD "Staff Review" Table 2 dated May 13, 2015)	**Meets requirement**: 81 FR 2019, 2025

Regulation	Summary	Utah SIP	SIP Proposal
CAA §7491(g)(1), (2); Preamble BART Alternative rule; Appendix Y[7]	Cost Difference	**Meets requirement** 2015 Utah RH SIP at XX.D.6(c) (including TSD "Staff Review" Table 2 dated May 13, 2015)	**Meets requirement:** EPA proposed to ignore this requirement, but should not have.
CAA §7491(g)(1), (2); Appendix Y	Energy and non-air quality impacts	**Meets requirement** 2015 Utah RH SIP at XX.D.6(c) (including TSD "Staff Review" Table 2 dated May 13, 2015)	**Meets requirement:** EPA proposed to ignore this requirement, but should not have.

[7]As explained in more detail below, consideration of the cost difference between the SIP Proposal and the FIP Proposal is another underlying aspect of the Applicable BART Alternative Requirements which EPA fails to acknowledge in the SIP Proposal. See 81 FR at 2024 ("…it is not material to our action whether we agree or disagree with Utah's conclusion that the BART Alternative would have lower cost impact….").

Notwithstanding EPA's lengthy Proposed Action (which covers 48 pages in the Federal Register), whether or not EPA ultimately must approve the Utah SIP boils down to whether the BART Alternative in the Utah SIP meets the Applicable BART Alternative Requirements. Because it does as EPA properly proposes to conclude and as demonstrated by the Utah SIP itself, EPA must approve the Utah SIP. It is that simple.

Response: The response to this comment is provided in the FRN.

On the commenter's point that it is fully within a state's discretion whether to adopt a BART Alternative, we respond to this issue elsewhere in the Legal Issues section of this document along with our responses to other comments related to EPA authority and state discretion.

Comment: [PacifiCorp, p. 2] EPA should evaluate all visibility metrics under the weight of the evidence test. Although EPA does an adequate job in identifying and weighing most of the available metrics, data and information under its weight-of-evidence analysis, it gives far too much weight to certain metrics (like the 98th Percentile metric) and not enough to other metrics (like cost and the timing of emission reductions under the BART Alternative analysis). By properly considering evidence, data and information and assigning the proper weight to each, EPA's approval of the Utah SIP Proposal will become even stronger.

Response: EPA agrees in part and disagrees in part. In the context of this action, we agree that we should evaluate all of Utah's visibility metrics under the weight-of-evidence analysis. However, we disagree that we should evaluate metrics that do not relate to the relative visibility benefits of BART and the BART Alternative. As discussed in Section 1.j.i, we do not consider cost a relevant metric in a weight-of-evidence analysis.

We further disagree that we assigned too much weight to the 98th percentile metric. The purpose of the weight-of-evidence analysis is to determine if the State's BART Alternative would result in greater visibility benefits than BART. As explained elsewhere in this section, the 98th

percentile CALPUFF modeling results are the most relevant to this determination because they take into account peak visibility impacts, consistent with the CALPUFF modeling approach used by the State. The 98th percentile results are also a key metric recommended by the BART Guidelines when selecting BART controls, and we described this metric as an appropriate measure for determining the degree of visibility improvement to be expected from controls.[65] In addition, EPA has relied on the 98th percentile metric in many of its past actions as "an appropriate measure for determining the degree of visibility improvement to be expected from controls." 81 FR 2004, 2030 (Jan. 16, 2016).[66]

In contrast, as explained in the FRN and elsewhere in this RTC document, we find that several of the State's other visibility metrics have inherent weaknesses and/or showed relatively little difference in visibility benefits between the BART Benchmark and Alternative, which led us to assign them less weight.

Comment: [UAMPS, p. 5] However, UAMPS disagrees with EPA's proposals to find that some of the elements Utah relied upon only marginally support Utah's demonstration of greater reasonable progress. Even marginal support cannot be dismissed but must be weighed in the balance with all other evidence in favor of greater reasonable progress.

Response: The response to this comment is provided in the FRN.

Comment: [PacifiCorp, p. 12] *Greater Emission Reductions Test* EPA asserts that Utah applied both[67] the "greater emission reductions" test (40 C.F.R. 51.308(e)(3)) and the "weight of evidence" test (40 C.F.R. 51.308(e)(2)) to conclude that the BART Alternative achieves greater reasonable progress. See 81 FR 2021, 2028. Also, EPA proposes to conclude that Utah failed to satisfy the greater emission reductions test. Id. at 2028. Further, EPA asserts that "[w]hile in the aggregate there are fewer SO_2 and PM_{10} emissions for the BART Alternative, the total NO_x emissions are greater under the BART Alternative than the BART Benchmark." Id. EPA, however, is simply wrong in its assertion that Utah applied the greater emission reductions test under 51.308(e)(3) in support of the Utah SIP. Utah, in fact, intentionally did not apply the greater emissions reductions test:

"Utah has chosen to use a weight-of-evidence approach under 40 CFR 51.308(e)(2)(i)(E), as described in section VII of the staff review. The separate visibility analysis described in section

[65] 40 CFR 51, appendix Y, section IV.D.5; 70 FR 39129 (July 6, 2005).

[66] While several commenters expressed concerns regarding our use of provisions from the BART Guidelines, even assuming that EPA's proposed uses of the BART Guidelines were new, our proposed action provided the public with the opportunity to comment. As evidenced by the comments throughout, the commenters had the opportunity to comment on EPA's use of the Guidelines to evaluate the Utah RH BART Alternative SIP and to identify any concerns associated with the approach.

[67] According to the U.S. Court of Appeals for the 10th Circuit, greater reasonable progress can be demonstrated using *either* one of two methods: (i) "greater emission reductions" than under BART (40 C.F.R. §51.308(e)(3)); or (ii) "based on the clear weight-of-evidence" (40 C.F.R. §51.308(e)(2)(E)). WildEarth Guardians v. EPA, 770 F.3d 919, 935-37 (10th Cir. 2014). As the court observed, the state is free to choose one method or the other. The court characterized the former approach as a "quantitative" and the later as "qualitative," and specifically sanctioned the use of qualitative factors alone under the clear weight-of-evidence test to demonstrate greater reasonable progress.

VIII is part of the weight-of-evidence demonstration and is not intended to provide the type of modeling demonstration that would otherwise be required under 40 CFR 51.308(e)(3)." See Utah SIP Staff Review (Chapter 1) at page 31 (May 13, 2015)

The Utah SIP could not be any clearer on this point.[68] EPA's proposal to disapprove an assumed "greater emissions reduction test" portion of the Utah SIP is tantamount to setting up a straw man for the sole purpose of knocking it down. EPA should not rely on any conclusion or inference[69] created by asserting that Utah failed to meet the greater emission reductions test, and EPA should erase any such reference from its final action.

Response: The response to this comment is provided in the FRN.

Comment: [PacifiCorp, p. 63] Based on extensive dispersion modeling using CALPUFF, Utah determined that the Alternative Measure projects better visibility conditions using a number of different metrics, including: (i) better visibility improvement because of the focus on SO_2; (ii) more days of visibility improvement; (iii) better average deciview improvement across Class 1 Areas; and (iii) better 90th percentile average deciview improvement across Class 1 Areas. *See* Staff Review, Section VII, pages 10-18. EPA has proposed approval of an Alternative Measure for the Apache Generating Station in Arizona on similar "weight-of-evidence" grounds. 79 Fed. Reg. 56,322, 56,327 (Sept. 19, 2014). EPA has also approved a similar Alternative Measure in Washington based, in part, on a reduction in the number of days of impairment greater than 0.5 dv and 1.0 dv. 79 Fed. Reg. 33,438, 33,440-42 (June 11, 2014).

Response: The commenter's comparisons to our actions for Apache and Tesoro (Washington) are notably different from Utah's BART Alternative. Our response pertaining to the Apache example is provided elsewhere in this document. For the Tesoro example, EPA initially proposed to include a BART alternative offered by Tesoro in a FIP that was based on an overall emission test that would have relied on interpollutant trading to demonstrate that the BART alternative was better than the BART benchmark. However, in response to adverse comments on that approach, EPA issued a second proposal that required and used CALPUFF modeling results. The 98th percentile CALPUFF results showed that the visibility improvement from interpollutant trading (i.e., the alternative SO_2 reductions substituted for the NO_x emission reductions, the latter were required to meet the BART benchmark) would be greater than the visibility improvement from BART benchmark with just the NO_x reductions at all seven Class I areas.[70] This is notably different from the Utah case where we discuss later in in this document under the section for the 98th percentile metric that Utah's BART Benchmark would result in greater visibility improvement at five of the nine Class I areas, and is better on average across all nine Class I areas.

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[68] In fact, EPA's May 1, 2015 letter to the Utah Division of Air Quality (noted above) regarding the then-proposed Utah SIP acknowledges that Utah is applying only "its weight-of-evidence analysis" and not the greater emission reductions test.

[69] As explained above, EPA goes to great lengths in attempting to paint the Utah SIP as being more complicated than other regional haze SIPs, thus requiring EPA to also consider the dueling FIP Proposal. Because EPA never had the need to consider the greater emission reductions test under 51.308(e)(3) in its review of the Utah SIP, EPA's presumed complexity is reduced and EPA's purported necessity to consider two coproposals is further diminished.

[70] 78 FR 79344, 79355 (Dec. 30, 2013).

Comment: [Conserv Orgs, p. 41] Utah's reliance on visibility metrics other than the 98th percentile impacts also is unfounded because, as EPA recognized, they demonstrate negligible differences between the BART Alternative and BART Benchmark scenarios. EPA correctly noted that Utah's modeling results show that the BART Alternative would result in more days with impacts greater than 1.0 dv at seven of the nine modeled Class I areas, while only two Class I areas would have fewer days exceeding 1.0 dv impacts under the BART Alternative as compared with the BART Benchmark scenario.[71] Utah's modeling did not show any meaningful difference between the BART Alternative and BART Benchmark scenario at most Class I areas with respect to the average number of days with impacts greater than 1.0 dv.[72] Accordingly, metrics based on the number of days exceeding identified thresholds are not indicative of the BART Alternative's superiority under the "clear weight-of-evidence" test. Similarly, EPA must reject Utah's reliance on annual average visibility impacts and the 90th percentile impacts in its "clear weight-of-evidence" evaluation as both metrics demonstrate largely equivalent benefits of the BART Alternative and BART Benchmark scenarios.[73]

Response: The response to this comment is provided in the FRN.

Comment: [PacifiCorp, p. 4] The SIP Proposal produces better visibility improvement under every metric (except one) and does so at cost savings of over $700 million[74] compared to the FIP Proposal.

Response: The response to this comment is provided in the FRN and elsewhere in this RTC document. We additionally note that our revised estimate of the capital cost of FIP controls is $517 million.

Comment: The State data has also demonstrated the cost of the SCR technology would provide only marginal improvements.

Response: We disagree with this comment. As explained in the FRN and elsewhere in this RTC document, we determined that installing and operating SCR at the State's four subject-to-BART units would provide cost effective emission reductions resulting in significant visibility improvements at the affected Class I areas.

i. Annual Emissions Comparison for Visibility-Impairing Pollutants

Comment: [UARG, p. 16] In its discussion of this issue, EPA cites several other regional haze rulemakings. Perhaps most significant, EPA invokes its April 10, 2015 rule approving a BART alternative for the Apache Generating Station to support its contention that the 40 C.F.R. § 51.308(e)(3) greater-emission-reduction test should not be used when a BART alternative does

[71] 81 Fed. Reg. at 2,029.
[72] *Id.*
[73] *Id.* at 2,030.
[74] As explained below, adding LNB/OFA/SCR to the Utah BART Units will cost approximately $170 million for each unit, with the total for all four Utah BART Units exceeding $700 million. By contrast, EPA incorrectly asserts that the cost of LNB/OFA/SCR at each Utah BART Unit is about $110 million.

not reduce emissions of each pollutant to a greater extent than the BART benchmark would. *Id.* But the Apache Generating Station rulemaking featured remarkably different circumstances. First, that alternative was "expected to result in *greater total emissions* than EPA's BART FIP." 80 Fed. Reg. 19,220, 19,221 (Apr. 10, 2015) (emphasis added). In contrast, the Utah BART Alternative would result in significantly fewer overall emissions of visibility-impairing pollutants. 81 Fed. Reg. at 2016. Further, as discussed above, Utah provided an analysis explaining why the BART Alternative's greater number of tons of SO_2 emission reductions (relative to the fewer tons of NO_x reductions that the Alternative would achieve) were more effective in reducing visibility impairment. In the Apache Generating Station rulemaking, no such analysis existed. Moreover, the State of Arizona in that matter did not even attempt to rely on the 40 C.F.R. § 51.308(e)(3) test. *See* 80 Fed. Reg. at 19,221. Thus, EPA's supposed precedent does not support its proposed disapproval of the Utah BART Alternative.

Response: We partially agree with this comment. First, as we clarified in the FRN, we are not disapproving Utah's BART Alternative under the 308(e)(3) greater emission reductions test as we had proposed. However, at proposal we also referredto 308(e)(3) and the Apache action to support our position that the greater-emission-reduction test should not be used when a BART alternative does not reduce emissions of each pollutant compared to the BART benchmark as well as to support our determination to place the most weight on the 98th percentile modeling metric in our evaluation of Utah's weight-of-evidence analysis. We agree with the commenter that we considered overall emissions in a different manner in our Apache action than we do for Utah. However, as noted above, our rationale in that action is relevant here. For Apache, the BART Alternative resulted in greater total emissions than EPA's BART FIP; in particular, the Apache BART Alterative resulted in greater NO_x emissions, but lower emissions of SO_2 and PM_{10}. Arizona therefore chose not to apply the "greater emission reductions" test, but instead to employ a clear weight-of-evidence approach under 40 CFR 51.308(e)(2) to demonstrate that the alternative achieves greater reasonable progress than BART. Arizona used its emissions reductions analysis to satisfy the regulatory requirements at 40 CFR 51.308(e)(2)(i)(D) (requiring an analysis of projected emission reductions under the alternative). EPA then evaluated the State's modeling demonstration and determined that the Apache BART alternative would achieve greater reasonable progress than BART. EPA considered emissions reductions for all pollutants in the Apache action, but not all pollutants in the aggregate because not all the pollutants were reduced under the BART alternative. In that example, EPA considered all elements of State of Arizona's analysis, but gave the most weight to the visibility impacts based on the CALPUFF 98th percentile modeling results.[75]

In contrast, Utah offered its analysis of aggregate emission reductions both to satisfy 40 CFR 51.308(e)(2)(i)(D) and as a metric in its weight-of-evidence demonstration. As explained in the FRN and elsewhere in this RTC document, we find that considering aggregate emissions when not all visibility-impairing pollutants are reduced under the alternative as compared to BART does not on its own provide meaningful information about visibility impacts. Therefore, while we agree that the contexts of the Utah and Apache actions differ with regard to the States' uses and interpretations of their emissions analyses, our position regarding the appropriate role of aggregate emission reductions is consistent across actions. Our position on the significance of

[75] 79 FR 56322, 56328 (Sept. 19, 2014).

SO_2 emission reductions compared to NO_x reductions is discussed elsewhere in this document and the FRN.

Comment: [UARG, pp. 16-17] Other rulemakings that EPA cites also do not appear to provide support for disapproval of Utah's BART Alternative. For example, EPA cites its 2012 proposed regional haze rule for Colorado. 77 Fed. Reg. 18,052, 18,074-75, Tables 26 & 27 (Mar. 26, 2012). Under that rule, however, the Colorado BART alternative would result in 2,415 tons of SO_2 emissions per year and 4,366 tons of NO_x emissions per year, compared to the substantially higher 8,614 tons of SO_2 emissions per year and 15,996 tons of NO_x per year under presumptive BART limits, making EPA's example completely unlike the present situation. *Id.* The same is true with respect to the proposed and final rules for Maryland that EPA cites. 77 Fed. Reg. 11,827, 11,837 (Feb. 28, 2012) (SO_2 and NO_x emission reductions under the BART alternative exceed what would be achieved by BART); 77 Fed. Reg. 39,938, 39,940-41 (July 6, 2012) (same). EPA's citation to its 2014 rule for the Tesoro Refinery is also inapposite. There, EPA referred to a general discussion in the regional haze rule preamble addressing the fact that interpollutant trading among geographically dispersed sources in regional programs can be complicated to evaluate, went on to discount such difficulties in the context of evaluation of interpollutant trades that occur at a single facility, and suggested that remaining difficulties can be overcome by "a technically acceptable" assessment. 79 Fed. Reg. 33,438, 33,441 (June 11, 2014). Any such difficulties in the present rulemaking are overcome by Utah's demonstration that SO_2 emission reductions are more effective in reducing visibility impairment in the Class I areas affected by the Hunter and Huntington subject-to-BART units and by the significantly greater SO_2 emission reductions relative to NO_x emission reductions that would be achieved under the BART Alternative as compared to the BART Benchmark.

Response: The commenter claims that EPA's references in our proposal to other rulemakings in Colorado and Maryland do not support EPA's disapproval of the Utah plan. The commenter appears to have misunderstood the emissions reductions in these actions. Both NO_x and SO_2 emissions under the Colorado and Maryland plans were lower for the BART alternative compared to BART presumptive limits. In addition, Colorado's and Maryland's BART alternative programs were designed to meet requirements other than BART.[76] Based on these considerations, EPA determined the BART alternatives were better than BART for the Colorado and Maryland plans. For Tesoro, to address the concerns raised about interpollutant trading and proposed reliance on aggregate emissions, EPA conducted CALPUFF modeling for the final rule; and explained that CALPUFF, using the approved modeling protocol, addressed the different light extinction properties of different pollutants. The Tersoro example is similar to Utah in that modeling was conducted to compare the scenarios because all visibility impairing pollutants were not lower under the Alternative. Our position on the significance of SO_2 emission reductions compared to NO_x reductions is discussed elsewhere in this document and the FRN.

[76] Specifically, Colorado's BART alternative plan was designed to help the State achieve its overarching reasonable progress goals and o meet the requirements of Colorado House Bill 10-1365 and §40-3.2-202, C.R.S.-Colorado's Clean Air-Clean Jobs Act. Maryland's

Comment: [NPS, p. 2] Total emissions reductions cannot be used to justify that the BART Alternative is better than BART if one pollutant increases while another decreases.[77] Sulfur dioxide (S02) emissions would be lower under UDAQ's BART Alternative than under BART, however NO_x emissions would increase in the BART Alternative.

Response: As explained elsewhere, we agree with this comment.

Comment: [UDAQ-HT, p. 20] In its FIP proposal, the EPA states that it is not appropriate to combine all three pollutants in the annual emissions comparison test. Under Utah's proposed alternative to BART scenario, two of the three haze causing pollutants, SO_2 and PM_{10}, are reduced more than under the BART scenario. Therefore, the overall pollution reduction is greater under Utah's alternative to BART scenario.

Response: The response to this comment is provided in the FRN and elsewhere in this document.

Comment: [UDAQ, p. 11] There are several problems with EPA's analysis. First, an evaluation that considers each pollutant individually gives greater weight to one pollutant over another and is contrary to the stated goal of improving visibility. Second, Utah's SIP is focused on reductions in SO_2 because it is the most significant anthropogenic pollutant in affected Class I areas, and those reductions have led to improvements in visibility and a positive impact on the experience of visitors to these areas. Third, EPA contradicts its own reasoning by finding that sulfate is the largest contributor to regional haze and SO_2 emission reductions should provide visibility benefits all year round (as opposed to NO_x reductions that are much more likely to occur in the winter months due to aerosol thermodynamics favoring nitrate formation in the winter). See id. at 2031. Therefore, EPA does in fact judge, predict, and compare the impacts of SO_2 reductions versus reductions in other pollutants. Consequently, EPA's reasoning that fully supports Utah's combination of all three pollutants for purposes of annual comparison test is more consistent and reasonable. EPA should employ this reasoning and find that the annual comparison test fully supports BART Alternative.

Response: We disagree that our proposed finding that "anthropogenic visibility impairment on the Colorado Plateau is dominated by sulfates" means that the particular combination of emission reductions that would occur under the State's BART Alternative would result in greater visibility benefits than the emission reductions under BART. The response to this comment is provided in the FRN and elsewhere in this document.

Comment: [Conserv Orgs – Gray Report, p. 11] The emissions of all visibility-impairing pollutant species are not uniformly lower for Utah's BART Alternative relative to the BART Benchmark (the combined SO_2 and PM_{10} emission rates are reduced, however the combined NO_x emission rates are higher under the BART Alternative). There is also a spatial shift in emissions between the two scenarios (between the Carbon plant emissions and the Hunter/Huntington emissions). Therefore the overall emission reductions cannot be used to support the assertion that the BART Alternative results in greater reasonable progress than the BART Benchmark. Instead, dispersion modeling must be conducted to determine whether the emission changes (overall

[77] 81 FR 2028 (Jan. 14, 2016).

reductions) would result in "better than BART" visibility. Therefore, the "better than BART" demonstration must rely on the visibility dispersion modelling results.

Response: Comment is noted. Utah clarified in its March 14, 2016 that "EPA erroneously imposed Section 308(e)(3) requirements on Utah's BART Alternative in addition to the Section 308(e)(2) weight-of-evidence test. EPA must withdraw its analysis of Utah's BART Alternative under the greater emissions reductions test because, as Utah clearly explained, the state never intended its data to satisfy this test." Accordingly, for determining whether the BART Alternative results in greater reasonable progress than the BART Benchmark, EPA is not considering Utah's BART Alternative based on overall emission reductions under the test laid out in 308(e)(3), but rather is relying on the State's weight-of-evidence analysis. Additionally, as discussed elsewhere, in these circumstances, while we consider the overall emissions reductions because the metric relates to visibility, in evaluating the weight, we determine the evidence is inconclusive. The State's weight-of-evidence analysis does include visibility dispersion modeling but is not intended to provide the type of modeling demonstration that would otherwise be required under 40 CFR 51.308(e)(3). Similarly, the spatial distribution of emission reductions is not relevant in this context because we are not evaluating the BART Alternative under the 308(e)(3) test.

Comment: [NPS, p. 2] We disagree with UDAQ that the proposed BART Alternative is better than BART and urge the EPA to partially disapprove the proposed Utah SIP revisions and implement a Federal Implementation Plan to require SCR on all four BART units. First, total emissions reductions cannot be used to justify that the BART Alternative is better than BART if one pollutant increases while another decreases.[78] Sulfur dioxide (S02) emissions would be lower under UDAQ's BART Alternative than under BART, however NO_x emissions would increase in the BART Alternative.

Response: We agree with the comments, appreciate the commenter's support for our determinations and the response to this comment is provided in the FRN.

Comment: [PacifiCorp, p. 13] *Annual Emissions Comparison of Visibility Impairing Pollutants*
In proposing to conclude that the Utah SIP demonstrates greater reasonable progress, EPA correctly notes that that the "combined emissions of NO_x, SO_2 and PM_{10} " under the BART Alternative "will be 2,856 tpy lower" than emissions resulting from the BART Benchmark.[79] See 81 FR at 2022. EPA properly proposes to view these aggregate emissions reductions "as part of the overall weight-of-evidence analysis," to be a materially positive factor in leading to visibility improvement.[80] Id. In every other context and program under the CAA,

[78] 81 FR 2004, 2028 (Jan. 14, 2016).
[79] As noted above, EPA has described the BART Benchmark as "the best system of continuous emission control technology available and the associated reductions for each source subject-to-BART covered by the alternative program…." See 81 FR 2004, 2011. Specifically, EPA considers the BART Benchmark under its Proposed Action to be "the most stringent NO_x BART controls, SCR plus new LNBs and SOFA, at the four BART units." *Id.* at 2015.
[80] EPA is blatantly wrong, however, in taking the opposite approach on this point in its proposal to approve the FIP Proposal and reject the SIP Proposal. *See* 81 FR 2004, 2029. There, EPA blindly concludes that "a comparison of emissions of multiple pollutant species of emissions [sic] is generally not informative, particularly when the Agency

lower overall emissions are considered a positive result. 42 U.S.C. §7401(c). EPA agrees this is true in the Utah SIP context as well, first by acknowledging that total SO_2 and total PM emissions are reduced significantly on an individual pollutant basis under the BART Alternative. In fact, EPA notes that SO_2 emissions will be reduced by 8,005 tpy under the BART Alternative. Also, when EPA steps out of the theoretical world of visibility modeling and into the real world of monitored visibility improvements, EPA agrees that aggregate emission reductions under the BART Alternative will have a greater measureable impact on improving visibility during more parts of the year than additional NO_x reductions would achieve under the BART Benchmark.[81] 81 FR 2004, 2022. Thus, under the BART Alternative, any potential adverse impact to visibility caused by a smaller decrease of NO_x emissions (compared to the BART Benchmark) is overcome by the increased visibility benefits of combined overall emission reductions.[82] In that case, EPA properly proposes to conclude that such significant aggregate emission reductions should be considered as an important element entitled to substantial weight in determining greater reasonable progress.

Response: We disagree with most of this comment. First, as explained in the FRN and elsewhere in this document, while we consider the evidence presented in annual aggregate emission reduction metric in the State's greater reasonable progress than BART analysis, we find this evidence is inconclusive. As explained elsewhere in this RTC document, we further disagree that it is appropriate to rely on monitoring data to conclude that aggregate emission reductions under the Alternative will have a greater impact on improving visibility than emission reductions under BART.

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is addressing whether an approach provides for greater reasonable progress towards improving visibility." This conclusion is demonstrably wrong, however, for the very reasons EPA has proposed to approve the BART Alternative in regard to this particular metric. For example, EPA concludes in support of the BART Alternative that, based on this very same metric, "the BART Alternative is likely to achieve greater reasonable progress," particularly in light of CALPUFF modeling results that shows greater SO_2 emissions reductions under the BART Alternative improve visibility far more than additional NO_x emissions reductions under the BART Benchmark. *Id.* at 2022. EPA also asserts in the FIP Proposal that, because each pollutant species reacts differently to humidity, chemistry, geography, etc., EPA should not consider the visibility improvement resulting from the collective emissions reductions. This conclusion also is demonstrably wrong for the reasons EPA states in proposing to approve the SIP Proposal. For example, EPA attempts to use the very reasons why EPA should approve the BART Alternative – the significant visibility improvement associated with the SO2 reductions because of humidity, chemistry, geography, etc.—as bureaucratic rationale to not approve the BART Alternative. *Id.* at 2022. Also, EPA's FIP Proposal holds up as the deciding factor visibility improvements resulting from fewer NO_x emission reductions under the BART Benchmark. At the same time, EPA acknowledges that this cannot actually be the case because it is SO_2 emission reductions under the BART Alternative – and not NO_x emission reductions under the BART Benchmark – that results in the greater visibility improvements during all parts of the year. *Id.* at 2022-24.

[81] "However, for reasons described later in subsection vii for our evaluation of Utah's IMPROVE monitoring metric, we propose to concur with Utah's finding that SO_2 emissions reductions should provide visibility benefits in all seasons and that sulfate is the largest contributor to visibility impairment at the affected Class I areas. Furthermore, we propose to find that these observations suggest that the BART Alternative is likely to achieve greater reasonable progress." *See* 81 FR 2004, 2022 (Jan. 14, 2016).

[82] This is so even though the visibility improvements associated with NO_x assumed under the BART Benchmark are wildly overstated. See Comments on the Use of CALPUFF Model in the EPA Proposed Rule on the Utah Regional Haze SIP, prepared by Gale F. Hoffnagle, TRC Environmental Consultants(March 2016) (hereinafter "**Hoffnagle Report**") and attached hereto as Attachment 3. If the visibility improvements associated with NO_x were stated properly, then the modeled visibility improvements under the BART Alternative would be even greater and provide even more reason for EPA to approve the BART Alternative.

Additionally, we disagree that it is appropriate to apply selected words, taken out of context, from one provision of the CAA to our evaluation of the State's SIP. The commenter suggests that we should approve Utah's BART Alternative simply because it is a "pollution prevention" approach under which annual aggregate emissions are lower under the Alternative than the Benchmark. However, this would have us make a determination that ignores the remaining elements of42 USC 7401(c) that provide pollution prevention is a *goal* to be encouraged to the extent *consistent* with the rest of the Chapter.[83] Congress specified that, under the regional haze program, the relevant consideration is the remedying and prevention of visibility impairment. 42 USC 7491(a)(1). Thus, to be consistent with both Sections 7401(c) and 7491(a), states must provide for pollution prevention measures that additionally remedy existing and/or prevent future visibility impairment. Furthermore, the commenter's interpretation would have us ignore the statutory BART requirements. 42 USC 7491(b)(2)(A).

Our proposal acknowledged that aggregate emissions were lower under the Alternative, but we found that Utah's BART Alternative does not meet the regulatory requirement that BART alternatives achieve greater reasonable progress than statutorily-required BART. Therefore, contrary to commenter's suggestion, the CAA does not require that we approve the measure simply because it prevents pollution.

Our positions on other aspects of this comment are discussed elsewhere in this document and the FRN.

Comment: [PacifiCorp, p. 63] The Alternative Measure is projected to reduce overall NO_x, SO_2 and PM emissions by 2,856 more tons per year than would be reduced assuming the installation of the most stringent NO_x technology at the most stringent potential NO_x emission limit. *See* Staff Review Section VII, page 9. EPA has approved, or proposed approval, of other BART Alternatives that included "inter-pollutant trading" when SO_2 levels were lowered. 79 Fed. Reg. 33,438, 33,440-41 (Washington, June 11, 2014); 79 Fed. Reg. 56,322, 56,328 (Arizona, Sept. 19, 2014).

Response: The response to this comment is provided in the FRN and elsewhere in this document.

Comment: [Conserv Orgs, p. 24] Utah's Regional Haze SIP does not achieve greater emissions reductions than BART. EPA's proposed rule correctly rejects Utah's reliance on the "greater emission reduction" test[84] because Utah's BART Alternative would result in an increase of NO_x emissions when compared to application of BART controls.[85] The "greater emission reduction" test should be rejected for the additional reason that the distribution of emissions is substantially

[83] One of the provisions in the "Congressional Findings and Declarations of Purposes" states that:
A primary goal of this chapter [Air Pollution Prevention and Control] is to encourage or otherwise promote reasonable Federal, State, and local governmental actions, consistent with the provisions of this chapter, for pollution prevention.
42 U.S.C. 7401(c) (emphasis added).
[84] 40 CFR § 51.308(e)(3).
[85] 81 FR 2,028.

different under Utah's BART Alternative than under BART. As highlighted in the Expert Report of Dr. Andrew Gray, the Carbon plant is geographically distinct from the Hunter and Huntington plants. Therefore, the spatial distribution of emissions from the plants is substantially different and affect different Class I areas.[86]

Response: Utah clarified in its March 14, 2016 that "EPA erroneously imposed Section 308(e)(3) requirements on Utah's BART Alternative in addition to the Section 308(e)(2) weight-of-evidence test. EPA must withdraw its analysis of Utah's BART Alternative under the greater emissions reductions test because, as Utah clearly explained, the state never intended its data to satisfy this test." Accordingly, for determining whether the BART Alternative results in greater reasonable progress than the BART Benchmark, EPA is not considering Utah's BART Alternative based on overall emission reductions under the test laid out in 308(e)(3), but rather is relying on the State's weight-of-evidence analysis. The spatial distribution of emission reductions is not relevant because we are not evaluating the BART Alternative under the 308(e)(3) test, and the State did not include this factor as a consideration in its weight-of-evidence analysis.

Comment: [PacifiCorp, p. 63] Because the BART-eligible Units and the Units covered under the Alternative Program are the same, and because Hunter Unit 3 and Carbon Unit 1 and Unit 2 are in the same general geographic location as the Units, Utah properly concluded that emissions under the Alternative Measure impact "the same general area" as would be impacted by the application of the most stringent NO_x BART surrogate. *See* Staff Review, Section IV, page 7, and Section XI, page 22.

Response: We agree with this comment.

Comment: [Conserv Orgs, p. 26] Ms. Stamper determined that the reason for Carbon's recent SO_2 emissions increase was due to burning of coal with unusually high sulfur content that was not reflective of typical operations for the Carbon plant and would not likely continue past 2016.[87]

Response: We generally agree with the commenter that the emission reductions Utah relied on in its BART Alternative are surplus to the baseline date of the regional haze program. However, there is some question, raised by other commenters, as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs, p. 26] Utah's projected Carbon emissions under the BART scenario ignores the fact that if the Carbon units were to continue operating, they would be subject to EPA's Mercury and Air Toxic Standard ("MATS") regulations that imposed emissions

[86] *See* 2016 Gray Modeling Report, at 11-13, 22.
[87] 2016 Stamper TSD at 34-37.

limitations on the plant beginning April 16, 2015.[88] Beyond that date, the units would have had to meet MATS emissions limits for SO_2 and/or PM. The federal SO_2 MATS emissions limit is 0.20 lbs/MMBtu.[89] In 2012-2013 Carbon Units 1 and 2 were emitting SO_2 at an average rate of 1,348 lbs/hour and 1,812 lbs/hr respectively. The corresponding SO_2 emission rates assuming compliance with MATS would be 234 lbs/hour and 323 lbs/hour.[90] Accordingly, had the plant continued to operate beyond April 15, 2015, the Carbon units would have had to reduce SO_2 emissions by approximately 82%.[91] Utah's projected emissions reduction analysis ignores this fact and instead assumes that these units could have continued to operate without SO_2 (or PM) controls in perpetuity at their 2012-2013 emission rates without complying with the currently mandated federal MATS emissions limits. Utah's projected emissions reduction analysis is arbitrary, factually incorrect, contrary to law and defies reality because it fails to project SO_2 emissions reductions mandated by the MATS rule that would have restricted such emissions at Carbon after April 15, 2015.[92]

Response: Our response to how Utah projected Carbon's SO_2 emissions is found elsewhere in this document.

Comment: [Conserv Orgs, p. 32] Assuming the Carbon units complied with the SO_2 surrogate limit of 0.20 lb/MMBtu for the acid gas HAPs[93], the SO_2 emissions from the Carbon units under the BART Benchmark scenario would be much lower as shown in the table below (Table 21 to the 2016 Stamper TSD [Technical Support Document]).

[88] Final Rule, National Emission Standards for Hazardous Air Pollutants From Coal and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 FR 9022, 9304 (Feb. 16, 2012).
[89] This is an acid gas surrogate limit. *See* 2016 Stamper TSD, at 43.
[90] *Id.* at 44-45.
[91] *Id.*
[92] Even if PacifiCorp had elected to operate the Carbon units in violation of MATS, the CAA authorizes either EPA or citizens to seek injunctive relief requiring closure of the units or compliance with the MATS emission limits. 42 USC 7602(a)(1). Thus, Utah's assumption that these units could have defied the law in perpetuity is arbitrary and capricious.
[93] 40 CFR Part 63, Subpart UUUUU, Table 2.

Table 5. Revised Estimated Emissions Under BART Benchmark and BART Alternative, Based on MATS Compliance for Acid Gas HAPS (Using SO2 Surrogate Limit), 2001-2003 NOx Emissions, and Revised Filterable PM10 Emissions for Carbon Plant.

Units	NOx Emissions (tpy)		SO2 Emissions (tpy)		Filterable PM10 Emissions (tpy)		Combined	
	Bench-mark	Alter-native	Bench-mark	Alter-native	Bench-mark	Alter-native	Bench-mark	Alter-native
Carbon 1	1,312	0	594	0	185	0	4,969	0
Carbon 2	1,977	0	901	0				
Hunter 1	775	3,412	1,529	1,529	169	169	2,473	5,110
Hunter 2	843	3,412	1,529	1,529	169	169	2,541	5,110
Hunter 3	6,530	4,622	1,033	1,033	122	122	7,685	5,777
Huntington 1	809	3,593	1,168	1,168	176	176	2,153	4,937
Huntington 2	856	3,844	1,187	1,187	200	200	2,243	5,231
Total	*13,102*	*18,883*	*7,941*	*6,446*	*1021*	*836*	*22,064*	*26,165*

Response: Comment noted. There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs, pp. 36, and 37] The only major difference between Dr. Gray's modeling and Utah's was the SO_2 emissions inputs for Carbon Units 1 and 2.

Dr. Gray used SO_2 emissions that reflected: 1) the median of the maximum daily SO_2 emissions, 2001-2014 ("Corrected SO_2 BART Benchmark scenario"); and 2) compliance with MATS (MATS#1 and MATS#2 scenarios).[94] The only difference between the two MATS compliance scenarios run by Dr. Gray is that the MATS#1 scenario allows for a NO_x emissions reduction credit at Hunter 3 resulting from installation of LNB in 2008. In contrast, the MATS#2 does not give credit for these NO_x emissions reductions.[95]

Response: As discussed in separate response to comments, we disagree with the modeled emission rates used by Dr. Gray for 1) Carbon SO_2 emissions, and 2) NO_x emissions from Hunter 3.

[94] 2016 Gray Modeling Report, at 3-4, 23-36; April 30, 2015 Gray Modeling Report attached hereto as Exhibit 14. The Conservation Organizations maintain that it is improper for Utah to have relied on any sulfur dioxide emission reductions whatsoever in accounting for the emission reductions or visibility benefits of its proposed BART Alternative. However, we provide analyses which include the proposed SO2 reductions as further justification that under no circumstance does this BART Alternative outperform NO_x BART or satisfy the BART Alternative provisions.

[95] Exhibit 14, April 30, 2015 Gray Modeling Report, at 2.

Comment: [Conserv Orgs, p. 37] Under the Corrected SO_2 BART scenario, reflecting more accurate historical Carbon SO_2 emissions, BART yields markedly lower peak visibility impacts than the Alternative scenario.

Response: We agree that the commenters' modeling indicates that the BART Benchmark would result in lower peak visibility impacts than the Alternative. However, there is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs, p. 37] Utah's reliance on uncharacteristically high SO_2 emissions from the Carbon Plant in 2012-2013 thus skewed the better-than-BART analysis.

Response: There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: **[Conserv Orgs, p. 42]** Dr. Gray demonstrates that if the SO_2 emission rates from the Carbon Plant are overestimated by even a modest amount, then the comparison of the Alternative scenario to the BART Benchmark will produce quite different conclusions regarding the merits of each scenario, as demonstrated below. Including a relatively small "correction" in the assumed baseline SO_2 emission rates for the two Carbon units results in an unambiguous determination that the BART scenario would achieve greater reasonable progress than Utah's BART Alternative.

Response: Comment noted. There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs, p. 50] Emissions of SO_2 from the Carbon Plant in 2002—the baseline date of the SIP—totaled only 6,764 tons/year.[96] However, Utah's BART Alternative takes credit for eliminating 8,005 tons/year of SO_2, which reflects the Carbon Plant's 2012-2013 SO_2 emissions.[97] Thus, the Carbon Plant's SO_2 emissions *increased* from the baseline date of the SIP—and the difference in emissions between 2002 and 2012-2013 cannot be considered "*reductions* resulting from measures adopted to meet requirements of the CAA as of" 2002.[98]

[96] 2016 Stamper TSD, at 33 (Table 8).
[97] 81 FR 2004, 2015 (Table 3).
[98] 40 CFR 51.308(e)(2)(iv) (emphasis added).

Utah should not be allowed emissions reduction credit for the shutdown of the Carbon units at emissions levels that exceeded the emissions as of the 2002 baseline date of the SIP. Such an approach would allow Utah to take credit for SO_2 emissions increases at the Carbon Plant above the 2002 baseline for the regional haze plan emission inventory, and such emission reductions at a level that exceed the 2002 baseline emissions inventory cannot be considered surplus.[99] Thus, if Utah may take *any* credit for Carbon Plan SO_2 emissions reductions, it may only take credit for the 6,764 tons/year that are arguably surplus to emissions reductions required as of the 2002 baseline date of the SIP.

Response: There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a State must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs, p. 50] Utah's request to take credit in the BART Alternative for the installation of low NO_x burners at Hunter Unit 3 (a non-BART unit) is also improper because the emissions reductions are not surplus to reductions required as of 2002.[100]

Response: The response to this comment is addressed elsewhere in the FRN and this document.

Comment: [Conserv Orgs -- Stamper Report, pp. 33-42]

Utah's Methods of Evaluating Whether its BART Alternative Will Achieve Greater Reasonable Progress than Implementation of NO_x ***BART***

Utah provided several analyses to justify its BART alternative as providing greater reasonable progress than BART. Utah used both a "clear weight-of-evidence" analysis and a "greater emission reductions" test" to support its BART alternative. In this section of my report, I provide comments and analysis regarding flaws in the emissions assumptions used in these analyses.

Utah's Modeling of the Carbon Units Based on 2012-2013 Emissions is Reflective of the Units Burning Higher Sulfur Coal than was Typical for the Carbon Plant's Historical Operations.

In analyses conducted to support its BART alternative, Utah used recent maximum daily emissions from 2012 and 2013 to reflect emissions from the Carbon units in modeling analyses and in annual emissions comparisons for the BART Benchmark and BART alternative. However, beginning in approximately 2010, the Carbon units began burning a significant quantity of higher sulfur coal than the units historically burned. As Table 8 below demonstrates, the annual SO_2 emissions had been increasing in recent years. The average emissions over the 2012-2013 timeframe used in Utah's analyses were over 37% higher than the 2001-2003 average of SO_2 emissions reflective of baseline for regional haze SIPs.

[99] 2016 Stamper TSD, at 57-58.
[100] 81 FR 2004, 2014.

Table 8: Carbon Units Annual SO2 Emissions 2001-2014[119]

Carbon Unit	Year	SO2 (tons/yr)	Carbon Unit	Year	SO2 (tons/yr)	Total SO2, tons/yr
1	2001	2,088	2	2001	3,100	5,187
1	2002	2,721	2	2002	4,043	6,764
1	2003	2,048	2	2003	3,440	5,488
1	2004	2,060	2	2004	3,581	5,642
1	2005	2,089	2	2005	3,321	5,410
1	2006	2,860	2	2006	3,919	6,779
1	2007	2,447	2	2007	4,065	6,511
1	2008	2,137	2	2008	2,920	5,057
1	2009	1,972	2	2009	3,522	5,494
1	2010	3,022	2	2010	4,440	7,462
1	2011	2,999	2	2011	4,741	7,740
1	2012	3,507	2	2012	4,800	8,307
1	2013	3,268	2	2013	4,434	7,702
1	2014	3,798	2	2014	5,443	9,241
	2001-2003 Average	2,286			3,528	5,813
	2012-2013 Average	3,388			4,617	8,005

[119] *See* Annual Emissions Data from EPA's Air Markets Program Database for Carbon Power Plant, 2001-2014 (Ex. 67).

The Carbon units have no SO_2 pollution controls, and have electrostatic precipitators (ESPs) at both units and cyclonic dust collector at Unit 1 for particulate matter control, which would not provide any co-benefit SO_2 control.[101] Thus, the units' SO_2 emission rate in terms of pounds SO_2 per heat input to the boilers would directly correspond to the sulfur content of the coal utilized at the plant, assuming the plant used coals of similar heat value (which it did, as will be discussed below). A review of the annual average lb/MMBtu SO_2 emission rates emitted by the Carbon units, the annual heat input to each unit, and annual hours of operation shows that the primary reason for the increased SO_2 emissions at the Carbon units was due to increased sulfur content of the coal used. This is shown in Table 9 below. As Table 9 demonstrates, although Unit 1 had higher heat input in 2012-2013 compared to the 2001-2003 timeframe, Unit 2 had lower heat input, and on a plantwide basis, the heat input in 2012-2013 was lower than the heat input during the 2001-2003 timeframe. However, the uncontrolled SO_2 emission rate increased by about 50% over the 2012-2013 timeframe, compared to the 2001-2003 timeframe. Clearly, the Carbon units had been burning higher sulfur coal in recent years of operation before the plant closed in 2015.

[101] *See* Title V Operating Permit, PacifiCorp Carbon Power Plant, Last Revised July 3, 2008, Permit Number 700002003, at 2 (Ex. 30).

Table 9. Carbon Units' Annual Average SO2 Rate and Annual Heat Input, 2001-2014[121]

Year	Carbon Unit 1 Annual Average SO2 Rate, lb/MMBtu	Carbon Unit 1 Annual Heat Input (MMBtu)	Carbon Unit 2 Annual Average SO2 Rate, lb/MMBtu	Carbon Unit 2 Heat Input (MMBtu)	Carbon Plantwide Annual Average SO2, lb/MMBtu	Carbon Plantwide Annual Average Heat Input, MMBtu/yr
2001	0.71	5,868,788	0.73	8,527,964	0.72	14,396,752
2002	0.89	6,123,950	0.92	8,815,680	0.90	14,939,630
2003	0.70	5,831,762	0.71	9,675,434	0.71	15,507,196
2004	0.94	4,384,625	0.89	8,005,025	0.92	12,389,650
2005	0.73	5,689,152	0.71	9,394,401	0.72	15,083,554
2006	0.85	6,740,398	0.84	9,300,537	0.85	16,040,935
2007	0.87	5,599,623	0.87	9,375,733	0.87	14,975,356
2008	0.75	5,662,229	0.74	7,890,721	0.75	13,552,951
2009	0.81	4,867,033	0.82	8,597,216	0.81	13,464,249
2010	1.04	5,824,550	1.04	8,538,282	1.04	14,362,832
2011	1.04	5,786,738	1.05	9,070,622	1.04	14,857,359
2012	1.13	6,181,514	1.10	8,764,617	1.12	14,946,131
2013	1.17	5,591,523	1.15	7,683,195	1.16	13,274,718
2014	1.31	5,799,259	1.31	8,303,670	1.31	14,102,929
2001-2003 Avg	0.77	5,941,500	0.79	9,006,359	0.78	14,947,859
2012-2013 Avg	1.15	5,886,519	1.12	8,223,906	1.14	14,110,425

[121] Heat input data from EPA's Air Markets Program Database. Annual Average SO_2 Emissions Rate in lb/MMBtu calculated from annual SO_2 and annual heat input from EPA's Air Markets Program Database. *See* Ex. 67.

The question is whether burning of such higher sulfur coal was typical of plant operation and whether such high SO_2 emission rates would have continued had the units continued to operate past April 15, 2015. A review of available data on the coal burned at the Carbon units indicates that this burning of higher sulfur coal was not reflective of typical operations for the Carbon plant and would not likely continue past 2016.

I reviewed several sources of information to verify when the Carbon units began burning higher sulfur coal and to assess whether that was likely to continue into the future, had the units continued to operate. First, I calculated annual average SO_2 emission rates for the Carbon units reported to EPA's acid rain database from 1995 to 2000. I found that the annual average SO_2 emission rates for those five years were in the range of 0.63 lb/MMBtu to 0.70 lb/MMBtu, similar to early 2000's.[102]

[102] *See* 1995 to 2000 Emissions Data from EPA's Air Markets Program Database at Ex. 31. It must be noted that the flow rate CEMs at power plants in use before approximately 2000 were known to be biased high, which affected

Second, I reviewed available data on the coal utilized at the Carbon units historically and more recently. For many years, the Utah Energy Office in the Department of Natural Resources issued reports on the review and forecast of Utah coal utilization, and often the reports identified the coal mines that each Utah power plant received its coal from. I reviewed those Utah Energy Office reports from the timeframe of the 1990's to present. In addition, the Energy Information Administration (EIA) has a database indicating the specific mines that power plants obtain their coal from, how much coal was shipped from each mine, and the coal characteristics (including sulfur content) of the coal from each mine as shipped to a power plant. That database had information on the various mines that supplied coal to the Carbon Power Plant from 2009 to 2013. I also found other sources of information that will be discussed below.

The Carbon units obtained coal from Utah coal mines primarily in Carbon and Emery Counties historically and until the plant shut down on April 15, 2015. For example, in 1996, the Carbon Plant obtained its coal from PacifiCorp's Deer Creek Mine in Emery County.[103] In 1998, nearly all the coal utilized at Carbon came from the Genwal mining company, which operated the Crandall Canyon mine in Emery County.[104] In 2000, nearly two-thirds of the coal used at Carbon came from the Genwal mining company's Crandall Canyon mine.[105] In 2003, the Carbon plant received coal from several Utah mines, with the majority of coal coming from Canyon Fuel mines, which were the Sufco, Skyline, and Dugout mines.[106] Similarly, in 2004, the Carbon plant obtained coal from several mines, with the majority from Canyon Fuel mines (Sufco, Skyline, and Dugout mines), Hidden Splendor mine and Co-op Mining Company Bear Canyon Mine.[107]

Utah coal in these counties is generally considered to be low sulfur bituminous coal although some medium sulfur coal (relative to other coals in the region) exists in the formations of Emery County.[108] For example, a 2001 document regarding coal available by railways indicated sulfur

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both the SO2 emissions reported and the heat input reported. *See* Western Regional Air Partnership, Voluntary Emissions Reduction Program for Major Industrial Sources of Sulfur Dioxide in Nine Western States and a Backstop Market Trading Program, An Annex Report to the Report of the Grand Canyon Visibility Transport Commission, submitted to the U.S. Environmental Protection Agency September 29, 2000, Appendix C at C-8 (Ex. 32). However, the flow measurements cancel out in the calculation of lb/MMBtu emission rates, thus the SO2 emissions in terms of lb SO2 per million Btu heat input from the 1995-2000 timeframe should be accurate. *See* U.S. EPA, Plain English Guide to the Part 75 Rule, June 2009, at Table 6, available at http://www2.epa.gov/sites/production/files/2015-05/documents/plain_english_guide_to_the_part_75_rule.pdf.

[103] *See* Jahanbani, F.R., 1996 Annual Review and Forecast of Utah Coal Production and Distribution, December 1997, at 12 (Ex. 33).

[104] *See* Utah Office of Energy & Resource Planning, 1998 Review and Forecast of Utah Coal Production and Distribution, July 1999, at 9, 18 (Ex. 34).

[105] *See* Utah Department of Natural Resources, 2000 Annual Review and Forecast of Utah Coal Production and Distribution, July 1999, at 9, 18 (Ex. 35).

[106] *See* Utah Energy Office, 2003 Annual Review and Forecast of Utah Coal Production and Distribution, October 2004, at 14 (Ex. 36).

[107] *See* Utah Geological Survey, Annual Review and Forecast of Utah Coal Production and Distribution – 2004, October 2005, at 16 (Ex. 37).

[108] *See* Bureau of Land Management, Price Field Office, Resource Management Area, Coal Report, at 8 (Ex. 38); downloaded from http://www.blm.gov/style/medialib/blm/ut/price_fo/Planning.Par.11662.File.dat/Appendix_25-Coal_Report_for_Carbon_and_Emery_Counties.pdf (last accessed March 5, 2016).

contents of various Utah coals as 0.6% or lower, with the exception of one coal mine served by the railways – the West Ridge Mine- which had a sulfur content of 1.15%.[109] Coal mines utilized by the Carbon units had lower sulfur content as reported in the 2001 document, such as Genwal's Crandall Canyon Mine with a sulfur content of 0.6%, Canyon Fuel's Skyline Mine with a sulfur content of 0.55%, Canyon Fuel's Dugout Mine with a sulfur content of 0.60%, Canyon Fuel's Sufco Mine with a sulfur content of 0.45%, and Co-op Mining Company's Bear Canyon #1 Mine with a sulfur content of 0.50%.[110] According to Utah coal quality data from the Utah Geological Survey's Energy and Mineral Statistics website for 2004 to 2014, the sulfur content of most other mines in the region were at or under 0.7% sulfur content, with the West Ridge mine coal being consistently at or above 1% sulfur content.[111]

It appears that the Carbon units were utilizing the lower sulfur coal back in the 1970's. A 1974 SIP review document indicates the sulfur content of the coal burned at the Carbon units was 0.5%.[112]

Based on the typical heat value of Utah coal, which ranges from 11,500 to 12,900 Btu/pound[113] and assuming that 5% of the sulfur in the Utah bituminous coal falls out in the bottom ash of the boiler[114], a 0.5% sulfur content of Utah coal from Carbon and Emery Counties would equate to an SO_2 emission rate exiting the boilers of approximately 0.77 to 0.86 lb/MMBtu. A review of the SO_2 emission rates in Table 9 above show that the Carbon units were generally emitting SO_2 in the range of 0.77 to 0.86 lb/MMBtu or lower until 2010, which likely indicates the units were burning coal of 0.5% sulfur content or less until 2010.

According to data reported to the Energy Information Administration (EIA), the Carbon Plant began burning significant quantities of medium sulfur coal from the West Ridge Mine in 2010 through at least 2013.[115] As stated above, the West Ridge Mine was known for higher sulfur content relative to other Utah mines in the Emery and Carbon County region.[116] The sulfur

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[109] *See* Guide to Coal Mines Served by Burlington Northern and Santa Fe Railway, produced and published by Coal Business Unit, Burlington Northern and Santa Fe Railway, at 48 (Ex. 39), available at http://www.multimodalways.org/docs/railroads/companies/BNSF/BNSF%20Coal%20Mine%20Guide%206-19-2001.pdf (last accessed March 7, 2016).

[110] *Id.* at 47-52. All of these Utah coalmines including the West Ridge mine, had similar heat value, ranging from 11,400 to 12,500 Btu/lb.

[111] *See* Average Coal Quality at Utah Mines, 2004 to 2014 tables, downloaded from Utah Geological Survey's Energy and Mineral Statistics website (at http://geology.utah.gov/resources/energy/utah-energy-and-mineral-statistics/#toggle-id-2 (last accessed March 5, 2016)), and attached as Ex. 40.

[112] *See* US EPA, Implementation Plan Review for Utah as Required by the Energy Supply and Environmental Coordination Act, EPA-450/3-74-081, at 36, Table C-1A (Dec. 1974)(Ex. 41).

[113] *See* Bureau of Land Management, Price Field Office, Resource Management Area, Coal Report, at 8 (Ex. 38).

[114] *See* US EPA, Compilation of Air Pollutant Emission Factors, AP-42, 5th Edition, Chapter 1.1 Bituminous and Subbituminous Coal Combustion, Table 1.1-3, footnote b, available at https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s01.pdf.

[115] See Energy Information Administration, *Coal Data Browser, for coal shipped to the Carbon Power Plant, with data for 2009 to 2013*, available athttp://www.eia.gov/beta/coal/data/browser/#/shipments/plant/3644/?freq=A&pin= (last accessed March 5, 2016) (Ex. 42).

[116] In describing the West Ridge coal sulfur content in this report as "higher," the intent is to state that the sulfur content is higher relative to other Utah coals, which the Utah Department of Natural Resources has stated in its coal reports. For example, according to a 2002 report by the Utah Department of Natural Resources, West Ridge mine

content of the West Ridge coal shipped to the Carbon Plant ranged from 0.98 to 1.22% from 2010 to 2013, compared to sulfur contents of 0.39% to 0.66% of the other coals used by the Carbon Plant during this timeframe.[117] The EIA Coal Data Browser database does not yet have information for 2014 coal shipments to Carbon. However, a draft 2014 Regional SO_2 Emissions and Milestone Report that is available on the Western Regional Air Partnership's website indicates that in 2014, SO_2 emissions from the Carbon units were higher due to higher sulfur content of coal as well as an increase in coal consumption.[118]

Based on the information reviewed as summarized above, the burning of higher sulfur content coal at the Carbon units during the 2010-2015 timeframe does not seem to be typical for the historical operations of the plant. Further, had the Carbon units stayed in operation past April of 2015, the units would very likely no longer burn coal from the West Ridge Mine and would likely have returned to utilizing coal with a sulfur content in the 0.4% to 0.7% range.

Specifically, expert testimony submitted by Seth Schwartz, principal of Energy Ventures Analysis, on behalf of Rocky Mountain Power, a subsidiary of PacifiCorp, to the Idaho Public Utilities Commission, (hereinafter referred to as the "Schwarz testimony") indicated that production at the West Ridge mine was declining by 2014, and the mine was expected to close in 2016.[119] While it is not clear what the Carbon units' source of coal would have been had the units kept operation, the information in the Schwarz testimony indicates that Carbon would no longer be receiving the 1% sulfur coal of the West Ridge Mine since the mine was projected to close in 2016. The Schwarz testimony specifically pertained to PacifiCorp's closure of its Deer Creek mine and justification for PacifiCorp's long term coal supply contract with Bowie Resources Partners.[120] The Schwarz testimony described the coal of the Bowie Resource Partners as low sulfur, less than 1% sulfur.[121] Based on PacifiCorp's long term coal contract with Bowie Resource Partners, it seems likely that, had PacifiCorp's Carbon units continued operation past April 2015, the units would be burning lower sulfur coal as had been typical for the units in the past. Clearly the units would no longer be utilizing the West Ridge medium sulfur coal, due to the closure of that mine. Moreover, if the Carbon units had continued operations, it is likely PacifiCorp would have sought out lower sulfur coal to lessen costs for the units to comply with the SO_2 /acid gas standards of the Mercury and Air Toxics Rule (MATS).[122]

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coal has high sulfur content for the region. *See* Utah Department of Natural Resources, Annual Review and Forecast of Utah Coal Production and Distribution 2002, at 15 (November 2003). (Ex. 43).

[117] *Id.*

[118] *See* Western Regional Air Partnership, Draft §309 2014 Regional SO2 Emissions and Milestone Report, posted to the WRAP Website on January 12, 2016, at 9 (Ex. 44) (available at http://www.wrapair2.org/reghaze.aspx, last accessed March 6, 2016).

[119] As discussed in December 15, 2014, Direct Testimony of Seth Schwartz, Redacted, In the Matter of the Application of Rocky Mountain Power for Approval of the Transaction to Close Deer Creek Mine and For a Deferred Accounting Order, at 21 (Ex. 45) (hereinafter "Schwartz testimony").

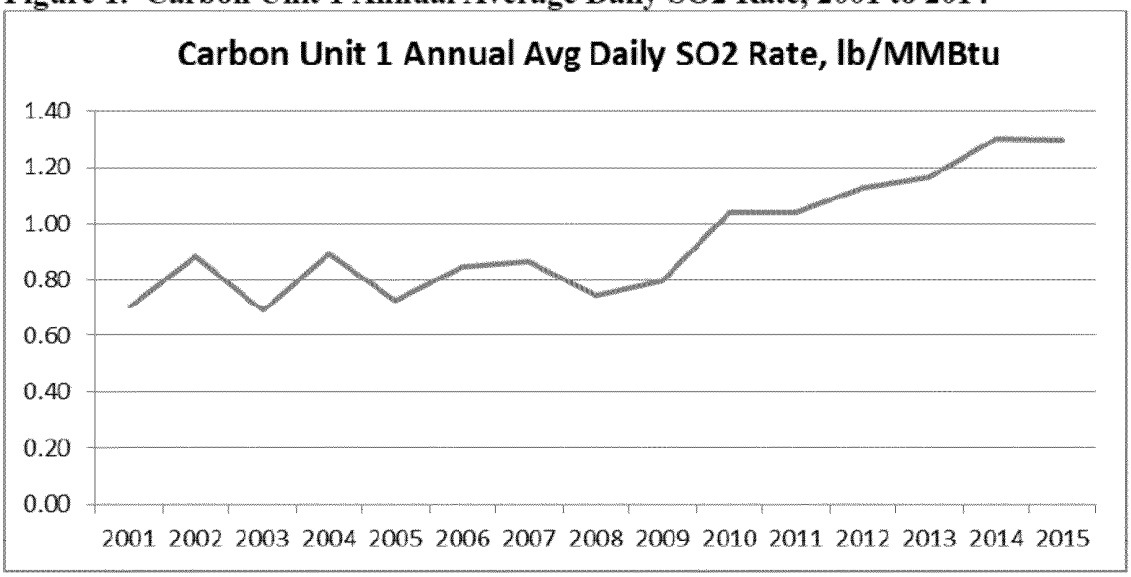
[120] See Schwartz testimony, at 3.

[121] *Id.* at 28-29.

[122] 40 CFR Pt 63, Subpart UUUUU, Table 2. The Carbon Units would have been subject to a limit on hydrogen chloride of 0.02 lb/MMBtu or a limit on SO2 of 0.2 lb/MMBtu to comply with the standards for acid gases of the Mercury and Air Toxics Rule.

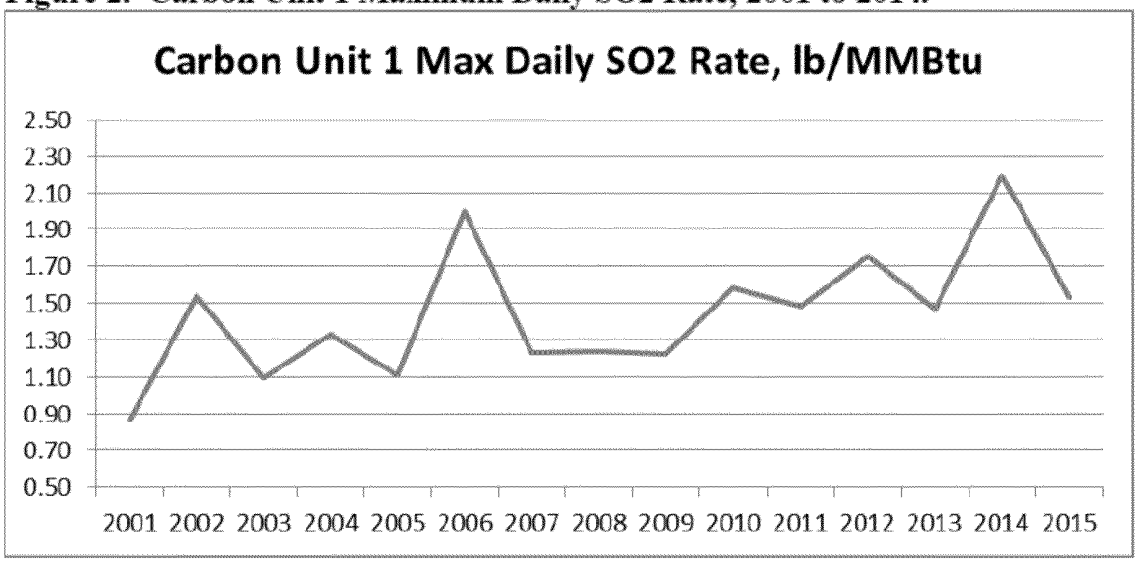
For these reasons, the use of 2012-2013 SO_2 emissions data for the Carbon units in the modeling of the BART Benchmark likely overstate the typical impact that the Carbon units had on visibility impairment at the affected Class I areas in recent years. In the BART Benchmark modeling, Utah modeled the maximum daily emission rate of SO_2 and other pollutants from the Carbon units over 2012-2013. As shown in Figures 1-4 below, the maximum daily SO_2 emissions rate in lb/MMBtu and the annual average of each of the maximum daily SO_2 emission rates in lb/MMBtu show a clear trend towards higher SO_2 emissions in the last few years of operation of the Carbon units, including the 2012-2013 years relied on by Utah in its analysis of the BART Benchmark.

Figure 1. Carbon Unit 1 Annual Average Daily SO2 Rate, 2001 to 2014[143]



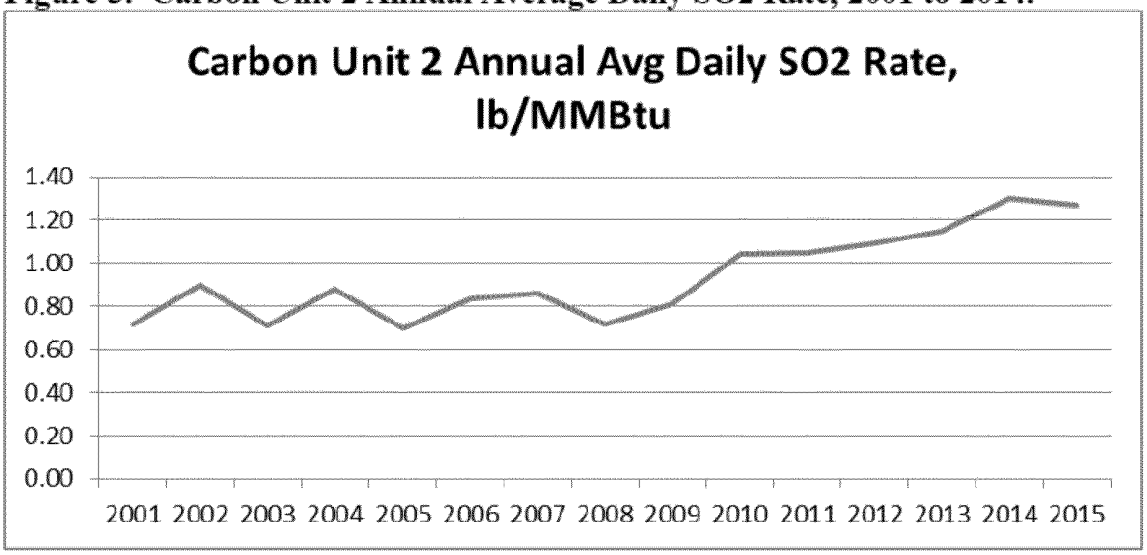
[143] Calculated from daily mass SO_2 emissions and heat input reported to EPA's Clean Air Markets Database.

Figure 2. Carbon Unit 1 Maximum Daily SO2 Rate, 2001 to 2014.[144]



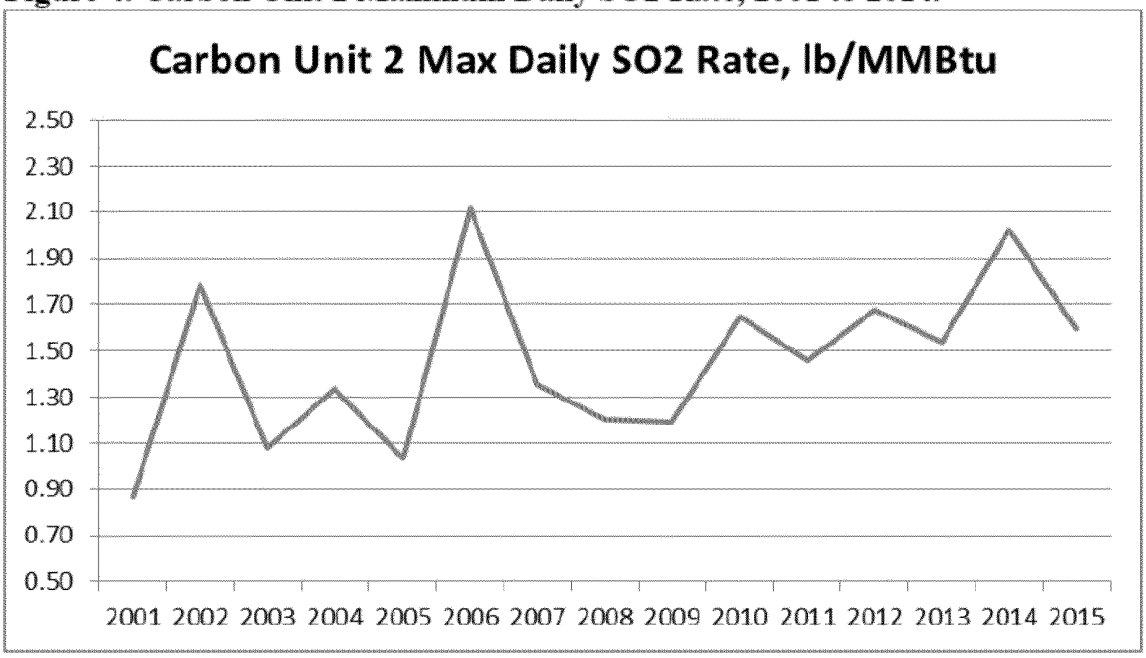
[144] *Id.*

Figure 3. Carbon Unit 2 Annual Average Daily SO2 Rate, 2001 to 2014.[145]



[145] *Id.*

Figure 4. Carbon Unit 2 Maximum Daily SO2 Rate, 2001 to 2014.[146]



[146] *Id.*

It must be noted that the spikes in SO_2 emissions rate in 2006 and in 2014 reflect an SO_2 emissions rate that appears to have exceeded a 1.0 lb/MMBtu sulfur in coal limit that existed in the Carbon Title V Permit.[123] A 1 lb/MMBtu sulfur in coal limit is reflective of a 1.9 lb/MMBtu SO_2 emission rate, assuming as indicated in EPA's AP-42 emission factors that 95% of the sulfur in bituminous coal is emitted as SO_2.[124] For the purpose of evaluating whether Utah's BART alternative of shutting down the Carbon plant will achieve greater reasonable progress than the BART Benchmark, a more typical maximum daily SO_2 emission rate should have been modeled for the Carbon units, rather than the maximum daily rate over 2012 -2013 which reflects the burning of higher sulfur coal from a coal mine that will be shut down this year. To account for the variability in the sulfur content of the coal burned at the Carbon units, but still not give undue credit for eliminating the peak SO_2 emissions of 2012-2013 which were not reflective of typical operation of the units, I evaluated the maximum daily SO_2 emissions of the units over the last 14 years of operation. Table 10 below provides the maximum daily SO_2 emission rate from each of the Carbon units in pounds per hour from the timeframe of 2001 to 2014. Based on a review of the data in Table 10, it is apparent that the maximum daily SO_2 emission rates are not evenly distributed and that the data was skewed by a lesser number of years with high SO_2 emission rates. Given the skewed distribution of the data, the median value of the maximum daily SO_2

[123] *See* Title V Operating Permit, PacifiCorp Carbon Power Plant, Last Revised July 3, 2008, Permit Number 700002003, Condition II.B.2.a., at page 16 (Ex. 30).
[124] *See* US EPA, Compilation of Air Pollutant Emission Factors, AP-42, 5th Edition, Chapter 1.1 Bituminous and Subbituminous Coal Combustion, Table 1.1-3, footnote b, available at https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s01.pdf.

emission rates over 2001-2014 would be the most appropriate of the central tendency of the maximum daily SO_2 emission rates for the Carbon units.[125] Thus, for the purpose of evaluating whether the BART Alternative would result in greater reasonable progress than the BART Benchmark, the Carbon units should have been modeled using the median daily SO_2 emission rates for each unit. This would ensure that the BART alternative modeling did not give too much credit to the elimination of SO_2 emissions from the Carbon units at levels that did not consistently occur and that would likely not continue into the future, had the Carbon units continued operation. Moreover, the use of the median maximum daily SO_2 emissions over the last 14 years also ensures that emission reduction credit is not given to the Carbon units during periods that the units may have been exceeding the 1 lb/MMBtu sulfur in coal limit of the plant's Title V permit. While use of median maximum daily emission rate would never be appropriate in a traditional BART determination, such an approach is justified in evaluating the skewed data relied on by Utah for this BART alternative.

Table 10. Maximum Daily SO2 Emission Rates for Carbon Units 1 and 2.[150]

Year	Carbon Unit 1, Max Daily SO2, lb/hr	Carbon Unit 2, Max Daily SO2, lb/hr
2001	695	957
2002	1,112	2,059
2003	844	1,226
2004	889	1,550
2005	927	1,171
2006	1,630	2,416
2007	873	1,576
2008	813	1,338
2009	860	1,353
2010	1,010	1,476
2011	1,010	1,526
2012	1,348	1,812
2013	1,161	1,569
2014	1,408	1,931
2012-2013 Emission Rate Modeled by Utah	1,348	1,812
2001-2014 Average	1,041	1,569
2001-2014 Median	968	1,538

[150] Based on daily emissions data reported to EPA's Air Markets Program Database (Ex. 68).

[125] Clark, G.M. and Cooke, D., 1998, A Basic Course in Statistics (Fourth Edition), Arnold, London, at page 22.

Because this 2012-2013 timeframe reflects a period when the units were burning uncharacteristically higher sulfur coal, it does not seem appropriate to allow Utah credit for eliminating SO_2 emissions that did not even consistently exist at the time of the baseline period of the regional haze SIP. The median value of the maximum daily SO_2 emissions over the past 14 years of operations would seem to more appropriately characterize the SO_2 emissions from the Carbon units and the impacts that these units were typically having on the Class I areas in the region. The modeling analyses comparing the BART alternative to the BART Benchmark should be based on the 2001-2014 median maximum daily SO_2 emission rate of 968 lb/hr for Carbon Unit 1 and 1,538 lb/hr for Carbon Unit 2. Therefore, I suggested the use of these SO_2 emission rates in additional visibility modeling performed by Andrew Gray (see separate Gray Report for results) to more realistically reflect the Carbon unit emissions.

Response: There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a State must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs -- Stamper Report, p. 43]

In Comparing the BART Alternative to the BART Benchmark, Utah Should Have Accounted for Carbon Units 1 and 2 Operating in Compliance with the Mercury and Air Toxics Standards.

As part of its comments to the UDAQ April 2015 proposal to adopt the BART alternative, the Conservation Organizations submitted a modeling analysis of UDAQ's "Most stringent NO_x" scenario but with changed emissions for Carbon Units 1 and 2. The Conservation Organizations are submitting that modeling to EPA as part of its comments on EPA's January 14, 2016 co-proposal on the Utah regional haze plan. This section of my report explains how the emissions were derived for the Carbon Power Plant in the Conservation Organizations' modeling analyses.

As previously stated, Utah's modeling of the BART Benchmark was based on 2012-2013 actual emissions for Carbon Units 1 and 2, and also was based on 2001-2003 actual emissions for Hunter Unit 3 and UDAQ's determination of the most stringent NO_x rate for the BART-eligible units of Hunter Units 1 and 2 and Huntington Units 1 and 2.[126]

UDAQ failed to account for other air pollution controls that would apply to the Carbon units beginning in 2015. Specifically, if the Carbon Power Plant units had not shut down in 2015, the units would have had to comply with EPA's Mercury and Air Toxics Standards (MATS) by April 15, 2015. Thus, any BART alternative should be compared to NO_x and PM BART at Hunter Units 1 and 2 and Huntington Units 1 and 2, as well as MATS compliance at Carbon Units 1 and 2. UDAQ did not model this scenario, and thus the Conservation Organizations have provided its modeling of this scenario into the record for consideration by EPA.

[126] *See* Table 2 of Utah's May 13, 2015 Staff Review of 2008 PM BART Determination and Recommended Alternative to BART for NO_x, at page 9. (Docket ID EPA-R08-OAR-2015-0463-0002).

The MATS rule would have imposed emission limits on Carbon Units 1 and 2 emissions of mercury, filterable particulate matter or specific non-mercury metal hazardous air pollutants (HAPs), and hydrogen chloride (HCl) or sulfur dioxide (SO_2) as a surrogate for acid gas HAPs.[127] In order to assess the impacts of MATS rule compliance on visibility impairment caused by Carbon Units 1 and 2, SO_2 emissions were projected based on compliance with the acid gas MATS surrogate limit of 0.20 lb SO_2 per MMBtu. The Carbon units have no SO_2 pollution controls and as shown in Table 9 above, have emitted SO_2 at rates of 0.63 lb/MMBtu and higher in the last 15 years. Thus, the units would need to reduce SO_2 to the acid gas HAPs surrogate limit of 0.20 lb/MMBtu to comply with MATS, and compliance would have been required by April 15, 2015.[128] Although NO_x emissions also may be reduced somewhat due to the work practice standards of the MATS rule (in 40 C.F.R. Part 63, Subpart UUUUU, Table 2), there is no specific NO_x emission limit mandated by the MATS rule.

With respect to PM emissions, it is possible that the PM emission rates at Carbon Units 1 and 2 would need to be reduced more to comply with MATS. However, the record does not include PM stack test data for Carbon Units 1 and 2, making it difficult to ascertain whether the units would need reduce PM to meet the 0.03 lb/MMBtu particulate matter MATS surrogate limit for non-mercury metal HAPs. Even if PM emissions did not have to be reduced to comply with the non-mercury metal HAPs limits, compliance with the mercury MATS limit may have necessitated the addition of a baghouse at each unit to be used with activated carbon injection, which would greatly reduce PM emissions from the current levels of control with ESPs at Carbon Units 1 and 2. However, because of the lack of PM stack test data for Carbon Units 1 and 2, no attempt was made to predict PM emissions reductions under MATS. This means that the Conservation Organizations' modeling of the BART/MATS compliance scenario in the revised BART Benchmark modeling likely overstated visibility impacts by not reducing the Carbon units' PM emissions to reflect MATS compliance.

To determine appropriate emission rates to model for the Carbon units in the Conservation Organizations' scenario of MATS compliance in the BART benchmark modeling, the maximum daily emission rates for Carbon Units 1 and 2 had to be determined. UDAQ modeled maximum daily NO_x rates for Carbon Units 1 and 2 based on 2012-2013 data in its Most Stringent NO_x BART scenario. Those same rates were modeled in the Conservation Organizations' scenario of MATS compliance and BART compliance although, as stated above, compliance with the work practice standards of the MATS rule may have resulted in somewhat lower NO_x rates. For the reasons discussed above, no reductions in PM emissions were assumed for MATS compliance at Carbon Units 1 and 2, so UDAQ's assumed PM emission rates were modeled on the Conservation Organizations' modeling for the MATS/BART scenario. The Conservation Organizations' modeling only made changes to the SO_2 emissions for Carbon Units 1 and 2.

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[127] 40 CFR Part 63, Subpart UUUUU, Table 2.

[128] Alternatively, the Carbon units could have complied with the 0.002 lb/MMBtu hydrogen chloride MATS limit instead of the 0.20 lb/MMBtu SO2 acid gas surrogate limit but, either way, a reduction in SO2 would be expected as a co-benefit of controlling HCl emissions or through direct compliance with the SO2 acid gas surrogate limit. Thus, it was assumed that the Carbon units if operated under MATS would comply with the 0.2 lb/MMBtu SO2 MATS limit.

It must be noted that, in deriving maximum daily SO_2 emission rates reflective of MATS compliance, I used the maximum daily SO_2 rates from the same 2012-2013 timeframe as used by Utah in its BART benchmark modeling, but then determined a controlled maximum daily SO_2 emissions rate for Carbon Units 1 and 2 reflective of compliance with the 0.20 lb/MMBtu SO_2 surrogate limit for acid gases under the MATS rule. However, as described in great detail above, the Carbon units were burning coal during the 2012-2013 timeframe that was untypical for the plant in that the coal had higher sulfur content relative to the other coals historically utilized at the Carbon units. None-the-less, the projected maximum daily SO_2 emission rates under MATS for Carbon Units 1 and 2 would be very similar whether based on the 2012-2013 emissions data or whether based on the median emission rates over 2001-2014. Further, using the 2012-2013 emissions data as a starting point for developing maximum daily SO_2 emission rates reflective of MATS compliance more readily provides for direct comparison of BART Benchmark/MATS Compliance modeling to Utah's BART Benchmark modeling results.

For SO_2, the maximum daily SO_2 emission rates in tons per day during 2012-2013 at each unit were determined, and also the three-year average annual SO_2 rate in terms of lb/MMBtu was determined. Then, to project the maximum daily SO_2 emission rates reflective of compliance with the SO_2 limit in the MATS rule, the percent reduction required from the 2012-2013 annual average lb/MMBtu SO_2 rate to achieve the 0.20 lb/MMBtu MATS limit was calculated, and it was assumed that the maximum daily pound SO_2 per hour emission rate at each unit during 2012-2013 would decrease by the same percent reduction with SO_2 controls to meet MATS. This is a commonly-applied method for predicting maximum daily emissions under control scenarios for BART modeling.

Specifically, Carbon Units 1 and 2 would have to reduce SO_2 by 82.6% and 82.2%, respectively, from 2012-2013 average lb/MMBtu emission rates to achieve the 0.20 lb/MMBtu SO_2 MATS limit.[129] These percent reductions were applied to the maximum daily SO_2 rates during 2012 to 2013 to project the maximum daily pound per hour SO_2 rates of the units expected under compliance with the SO_2 MATS limit.

Tables 11 and 12 below provide the maximum daily SO_2 and NO_x rates during the 2012 to 2013 and under compliance with MATS. Note that the pound per hour rates are simply based on multiplying the maximum ton per day emission rates by 2000 pounds per ton and dividing by 24 hours per day to arrive at a pound per hour rate that is used in the visibility modeling.

[129] *See* spreadsheet with 2012 to 2013 CAMD data for Carbon Units 1 and 2 at Summary tab (Ex. 46).

Table 11. Carbon 2012-2013 Baseline Max Daily SO2 and NOx Emission Rates[155]

	SO2, Max Daily Rate, 2012-2013, ton/day	SO2, Max Day 2012-2013, lb/hr	NOx, Max Daily Rate, 2012-2013, ton/day	NOx, Max Day 2012-2013, lb/hr
Carbon Unit 1	16.2 tpd	1,348 lb/hr	5.3 tpd	438 lb/hr
Carbon Unit 2	21.7 tpd	1,812 lb/hr	8.4 tpd	696 lb/hr

Table 12. Carbon Projected Maximum Daily NOx and SO2 Emissions Under MATS[156]

	SO2, Projected Max Daily Rate under MATS, ton/day	SO2, Projected Max Daily Rate under MATS, lb/hr	NOx, Max Daily Rate, 2012-2013, ton/day	NOx, Max Day 2012-2013, lb/hr
Carbon Unit 1	2.8 tpd	234 lb/hr	5.3 tpd	438 lb/hr
Carbon Unit 2	3.9 tpd	323 lb/hr	8.4 tpd	696 lb/hr

[155] *Id.*
[156] *Id.*

The projected SO_2 emission rates under MATS as shown in Table 12 above are significantly lower than the SO_2 emission rates modeled for the Carbon units in the BART Benchmark. Consequently, Utah's modeling analysis of the BART Benchmark overstates the visibility impacts under the BART Benchmark scenario. The Carbon units could not have continued operating without SO_2 controls past April 2015 pursuant to the MATS rule.[130] Indeed, the units would have had to install SO_2 controls to meet the MATS standard much earlier than the Hunter and Huntington units would have had to install SCR under a BART determination.[131] Thus Utah's BART Benchmark modeling scenario overstates the visibility impacts that would occur if the BART-subject units at Hunter and Huntington were required to install BART for NO_x and the Carbon Units 1 and 2 did not shut down.

Response: As noted elsewhere, any reductions occurring after the baseline date of the SIP (2002) are creditable towards the BART Alternative.

Comment: [Conserv Orgs -- Stamper Report, pp. 46-49]
Utah's Modeling of NO_x ***Emissions From Hunter Unit 3 in the BART Alternative is Flawed.***

[130] In 2015 the U.S. Supreme Court found that EPA erred when it determined that costs was irrelevant to its "necessary and appropriate" finding in adopting the MATS rule. *Michigan v. EPA,* 135 S. Ct. 2699 (2015). However, the Supreme Court did not issue a stay of the MATS rule or otherwise invalidate or alter the emission standards promulgated in the rule. EPA has issued a proposed supplemental finding on costs in response to the Supreme Court decision. 80 FR 75025. Thus, the MATS standards remain in effect and the Carbon plant would have been required to meet the MATS standards if it continued operating beyond April 15, 2015.
[131] Compliance with the MATS rule was required by April 15, 2016, with the possibility of obtaining two 1 year extensions. 40 CFR 63.9984(b); 63.6(i)(4)(A); *see also* 77 FR 9304, 9407-11 (Feb. 16, 2012). Compliance with BART must occur as expeditiously as possible, but no later than 5 years. 40 CFR 51.308(e)(2)(a)(iv). EPA has proposed to allow 5 years for SCR installation in its co-proposal requiring Hunter Units 1 and 2 and Huntington Units 1 and 2 to install SCR to meet BART. 81 FR 2004, 2041 (Jan. 14, 2016).

In the BART alternative modeling, Utah took credit for the NO_x reductions made at Hunter Unit 3 with the addition of low NO_x burners with overfire air. However, Utah's modeling of Hunter Unit 3 in its BART alternative was at a NO_x rate that the Hunter Unit 3 has exceeded numerous times over the past 8 years since the low NO_x burners were installed. Thus, the Utah modeling analyses overstates the benefits of the installation of these combustion controls at Hunter Unit 3 in the BART Alternative. The NO_x emission rates modeled by Utah for Hunter Unit 3 in the BART Benchmark and BART Alternative Scenarios are identified in Table 13 below.

Table 13. NOx Emissions Rates Modeled for Hunter Unit 3 in the BART Benchmark and BART Alternative Scenario

BART Benchmark	Basis for BART Benchmark Emissions	BART Alternative	Basis for BART Alternative Emissions
2,038.33 lb/hr	Max Daily NOx Emissions Over 2001-2003	1,240.32 lb/hr	Calculated (see below for explanation)

The data in Table 13 is from Utah's document entitled "Visibility Calculation Methodology."[132] This document shows how Utah calculated baseline and controlled NO_x emission rates for Hunter Units 1 and 2 and for Huntington Units 1 and 2 for the BART Benchmark and the BART Alternative.[133] For these BART-subject units, Utah followed the typical protocol for projecting the maximum emission rate for the control scenarios. That is, the actual annual average NO_x rate over the baseline period in lb/MMBtu is determined from EPA's Air Markets Program Database, and then the percent control to achieve the NO_x emission rate (in lb/MMBtu) of the control scenario is calculated. Next, the actual maximum daily NO_x emission rate in lb/hr during the baseline period is determined from EPA's Air Markets Program Database and that same percent control is applied to the baseline maximum daily NO_x emission rate to project the maximum daily NO_x emission rate under the control scenario.

A review of EPA's Air Markets Program Data and Utah's Visibility Calculation Methodology for Hunter Unit 3 shows that Utah did not apply the same methodology for determining Hunter Unit 3's maximum daily NO_x emission rate with the low NO_x burners/overfire air and, as a result, Utah significantly underestimated maximum daily NO_x emissions from Hunter Unit 3 in its BART Alternative modeling.

The low NO_x burners were installed at Hunter Unit 3 in the Spring of 2007.[134] The permit addressing the installation of the low NO_x burners as well as other pollution control upgrades at the Hunter plant, which included a new lower NO_x limit of 0.34 lb/MMBtu for Hunter Unit 3 among other things, was issued on March 13, 2008.[135] Thus, Hunter Unit 3 has been operating

[132] It is not clear whether this was submitted as part of the Utah regional haze SIP submittal, thus we are attaching Utah's Visibility Calculation Methodology as Ex. 62. This was made available to the public during the state's public hearing process on its BART alternative.
[133] *Id.* at 1.
[134] *See* December 18, 2009 letter from PacifiCorp to Utah, at 4. (Ex. 63). Although Utah and EPA state that the low NO_x burners were installed in 2008, PacifiCorp has stated that the low NO_x burners were installed in 2007.
[135] March 13, 2008 Approval Order for Hunter Plant (Ex. 64).

with the new low NO_x burners under a permit with a lowered NO_x emission limit since March of 2008.

Utah determined the pre-control level of NO_x emissions to model in the BART Benchmark modeling based on the maximum daily NO_x rate in lb/hr over the 2001-2003 baseline period. I have verified with EPA's Air Markets Program Data that the 2,038.33 lb/hr NO_x emission rate represents the maximum daily rate at Hunter 3 over 2001-2003.

Because Hunter Unit 3 has been operating for several years after installation of the low NO_x burners, Utah could have simply evaluated the maximum daily NO_x emission rate from a recent 2-year period to reflect controlled NO_x emissions for modeling in the BART Alternative scenario. However, it appears that Utah chose to project maximum NO_x emissions, and that is where the problems lie.

Utah's Visibility Calculation Methodology lists the Baseline Case annual average NO_x emission rate for Hunter Unit 3 as 0.4577 lb/MMBtu.[136] However, a review of annual average NO_x rates submitted to the Air Markets Program Database shows that there was no year from 2001 to 2015 that the annual average NO_x emission rate was as high as 0.4577 lb/MMBtu.[137] The highest annual average NO_x emission rate was 0.412 lb/MMBtu and it occurred in 2001.[138] The 2001-2003 annual average NO_x rate at Hunter Unit 3, which should have been used as the Baseline Case annual average NO_x rate, was 0.398 lb/MMBtu.[139]

A review of maximum daily NO_x emissions and lb/MMBtu emission rates shows that 0.4577 lb/MMBtu was the maximum **daily** NO_x emission rate over the 2001-2003 baseline period.[140] Thus, Utah's Visibility Calculation Methodology mistakenly (and misleadingly) reports the Baseline Case annual average emissions as 0.4577 lb/MMBtu, which is significantly higher than the actual annual average NO_x emissions over the baseline period of 0.398 lb/MMBtu. Utah's Visibility Calculation Methodology then identifies the Average Annual NO_x rate for the low NO_x burners and overfire air as 0.278509434 lb/MMBtu.[141] It is not clear how this value was derived. A review of annual average NO_x emission rates over all of the years since the low NO_x burners had been installed shows that no year has ever had an annual average NO_x emission rate as low as 0.278509434 lb/MMBtu.[142] The annual average NO_x emission rate over the 2012-2013 timeframe was 0.282 lb/MMBtu.[143] The 2012-2013 period was the timeframe evaluated by Utah for the BART-subject units to determine the units' controlled NO_x emission rates (i.e., actual annual average NO_x emission rates, reflective of the combustion controls).

Although it is not clear where the 0.278509434 lb/MMBtu NO_x emissions rate was obtained or how it was derived, it is clear that Utah's next step determined the percent reduction expected

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[136] Utah's Visibility Calculation Methodology at 2.
[137] Spreadsheet with Hunter Unit 3 Emissions, at Tab "Hunter 3 Annual Emissions" (Ex. 65).
[138] *Id.*
[139] *Id.*
[140] Spreadsheet with Hunter Unit 3 Emissions, at Tab "2001-03 Daily."
[141] Utah's Visibility Calculation Methodology at 2.
[142] Spreadsheet with Hunter Unit 3 Emissions, at Tab "Hunter 3 Annual Emissions" (Ex. 65).
[143] *Id.*

from the low NO_x burners/overfire based on Utah's 0.4577 lb/MMBtu NO_x emission rate during the Baseline Case to Utah's claimed 0.278509434 lb/MMBtu reflective of low NO_x burners/overfire. Utah then applied that calculated control efficiency to the maximum daily NO_x rate from 2001-2003 of 2,038.33 lb/hr. Specifically, to reduce NO_x from 0.4577 lb/MMBtu during the Baseline Case (i.e., maximum daily NO_x rate during 2001-03) to 0.278509434 lb/MMBtu (unclear how this was derived but is close to 2012-2013 *annual* average NO_x rate) reflects a percent reduction of 39.15%. Applying that 39.15% to the maximum daily NO_x rate during 2001-2003 of 2,038.33 lb/hr equals Utah's projected maximum daily NO_x rate for LNB/OFA at Hunter Unit 3 of 1,240.32 lb/hr. However, it was not appropriate to project the NO_x control efficiency of low NO_x burners/overfire based on the difference of the maximum daily NO_x rate during the baseline and the rate close to (but lower) than the *annual* average NO_x rate over 2012-2013.

There are significant problems with Utah's projected maximum daily NO_x emission rate for Hunter Unit 3 used in the BART Alternative scenario. Utah greatly overstated the NO_x control efficiency with low NO_x burners by using an unrealistically high baseline NO_x emissions rate (i.e., the lb/MMBtu emission rate from the maximum daily emissions over 2001-2003), and an unrealistically low emissions rate in the controlled scenario (i.e., a NO_x emission rate that is lower than actual NO_x emissions data after installation of the low NO_x burners at Hunter Unit 3). Using this overstated control efficiency had the effect of greatly understating the projected maximum daily NO_x emission rate from Hunter Unit 3 with low NO_x burners/overfire air in the BART Alternative scenario.

Actual emissions data confirms that Utah's approach grossly understated Hunter 3's controlled NO_x emissions in the BART Alternative scenario. A review of actual daily NO_x emissions data from March 13, 2008 (when the Approval Order was effective with a new, reduced limit on NO_x emissions of 0.34 lb/MMBtu[144]), through December of 2015 shows that Utah's modeled NO_x emission rate for Unit 3 in the BART Alternative scenario of 1,240.32 lb/hr was exceeded 55.8% of the boiler operating days.[145] I also evaluated the maximum daily NO_x emissions for each year of operation, starting on March 13, 2008 (when the Approval Order was issued with the lower NO_x emission limit for Hunter Unit 3) through the end of 2015 and found that, every year, maximum daily NO_x emissions exceeded the 1,240.32 lb/hr NO_x emission rate modeled by Utah in the BART Alternative scenario.

[144] *See* March 13, 2008 Approval Order, DAQE-AN0102370012-08, at 9, Condition 11.B.2.a. (Ex. 64). Note that this permit was issued approximately 9 months after PacifiCorp reported that it installed the low-NO_x burners at Hunter Unit 3 (see Ex.63), which should be more than sufficient shakedown period for efficient operation of the new low-NO_x burners.

[145] Spreadsheet with Hunter Unit 3 Emissions, at Tab "3-13-08 to 12-31-15" (Ex. 65).

Table 14. Hunter Unit 3 Maximum Daily NOx Emissions Rate, lb/hr, for Each Year from March 13, 2008 through 2015[173]

Year	Maximum Daily NOx Emissions, lb/hr
2008 (Beginning March 13, 2008)	1,985.58
2009	1,680.08
2010	1,696.83
2011	1,836.92
2012	1,788.08
2013	1,740.42
2014	1,571.42
2015	1,597.50

[173] *Id.*

As Table 14 demonstrates, the 1,240.32 lb/hr NO_x emission rate modeled by Utah for Hunter Unit 3 in the BART alternative is significantly lower than has been achieved at Unit 3 in any year since the low NO_x burners were installed. As shown above, the 1,240.32 lb/hr NO_x emission rate was based on a faulty projection of controlled emissions with low NO_x burners of Hunter Unit 3.

If Utah would have projected NO_x emissions from Hunter Unit 3 with low NO_x burners/overfire air using the commonly applied methodology that they followed for projecting daily NO_x emissions under BART for Hunter Units 1 and 2 and Huntington Units 1 and 2, Utah would have projected a NO_x emission rate of 1,741.3 lb/hr. Specifically, the annual average NO_x emission rate over the 2001-2003 baseline period was 0.398 lb/MMBtu and the 0.34 lb/MMBtu NO_x emission limit imposed in the 2008 Approval Order reflects a 14.573% reduction in NO_x . Applying a 14.573% reduction in NO_x to the maximum daily NO_x rate over the 2001-2003 baseline period results in a projected controlled NO_x rate of 1,741.3 lb/hr. This projected NO_x rate is very close to the average of the maximum daily NO_x rates from 2008 to 2015 presented in Table 14 above, which is 1,737.1 lb/hr.

In summary, Utah modeled a daily NO_x emission rate for Hunter Unit 3 in the BART Alternative scenario that is much lower than actual maximum daily NO_x emission rates at the unit since the installation of new low NO_x burners. Thus, Utah's modeling of the BART Alternative overstates the actual visibility benefit of the installation of low NO_x burners at Hunter Unit 3 and improperly causes the BART Alternative to appear to have greater visibility benefits than it has in reality.

Response: We agree that Utah made errors in calculating the modeled emission rate for NO_x from Hunter 3 for the BART alternative scenario. We also agree that this improperly caused the BART Alternative to appear to have greater visibility benefits than it would have otherwise.

The BART Guidelines direct states to:

> "Use the 24-hour average actual emission rate from the highest emitting day of the meteorological period modeled (for the pre-control scenario). Calculate the model results for each receptor as the change in deciviews compared against natural visibility

> conditions. Post-control emission rates are calculated as a percentage of pre-control emission rates. For example, if the 24-hr pre-control emission rate is 100 lb/hr of SO_2, then the post control rate is 5 lb/hr if the control efficiency being evaluated is 95 percent."[146]

Utah appears to have followed the first part of the guidance correctly in establishing the pre-control scenario for Hunter Unit 3 because the modeled emission rate of 2038.3 lb/hr (24.46 tons/day) is the highest actual daily emission rate from the 2001-2003 meteorological period. However, in applying the second part of the guidance, Utah appears to have over-calculated the control efficiency that has been realized with the LNB upgrades. As noted by the commenter, for the period 2001-2003, and prior to the LNB updgrades, Hunter 3 achieved actual NO_x emissions on a heat input basis of 0.398 lb/MMBtu. In the most recent three years, 2013-2015, and after the LNB upgrades, Hunter 3 achieved actual NO_x emissions on a heat input basis of 0.284 lb/MMBtu.[147] The resulting control efficiency associated with the LNB upgrades is 28.8%.[148] By contrast, and as noted by the commenter, the controlled emission rate used by Utah, 1240.3 lb/hr, reflects a 39.1% control efficiency [(1-1240.3/2038.3)*100 = 39.1%]. Therefore, if calculated correctly, the control efficiency of the LNB upgrades would be 10.3 percentage points less than calculated by Utah. As a result, the visibility benefits associated with the LNB upgrades at Hunter Unit 3 in the BART Alternative are overestimated by a similar degree. We do not expect that this somewhat minor correction would have a significant impact on the overall modeled visibility impacts when all pollutants and all sources included in the BART Alternative are considered. Even so, such a correction would support EPA's overall conclusion that a FIP is necessary because the weight-of-the-evidence does not support the proposed better-than-BART approach.

Comment: [Conserv Orgs -- Stamper Report, p. 50]

Utah's Evaluation of Projected Emission Reductions Under its BART Alternative

In its evaluation of projected emission reductions under its BART alternative, Utah used the average of Carbon's SO_2 emissions from 2012-2013, which as discussed above, reflects a timeframe when the Carbon units were burning higher sulfur coal than typically utilized at the units. Thus, it was not appropriate to include the Carbon Units' 2012-2013 SO_2 emissions as projected emissions under the BART Benchmark. Moreover, Utah should not be allowed to take credit for annual emissions reductions any higher than the annual average emissions as of the baseline date of the Utah regional haze plan.

In addition, had the Carbon units continued operating, the Carbon units would have had to significantly reduced SO_2 emissions to meet the acid gas requirements of the MATS rule. Thus, it was not appropriate to include uncontrolled SO_2 emissions in the BART Benchmark emissions tally when the Carbon units would have had to comply with the acid gas requirements of the MATS rule before the Hunter and Huntington units would have to install BART.

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[146] 70 FR 39104, 39170 (July 6, 2005).

[147] Using alternate post-LNB upgrade periods may result in a slightly different control efficiency; however, the conclusions do not change.

[148] Refer to spreadsheet prepared by EPA titled "Hunter and Huntington annual emissions.xlsx" located in the docket.

Utah also assumed PM_{10} emissions from the Carbon units that seem unreasonably high, and it is not clear how those emissions were calculated.
Based on these issues which will be discussed in detail below, Utah has overstated the emission reductions of its proposed BART alternative compared to the BART Benchmark.

Response: There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs -- Stamper Report, pp. 50-5110]
Utah's Assumed Annual NO_x ***Emissions for Hunter Unit 3 in the BART Alternative Are Not Justified and Seem Unreasonably Low.***
In its emission comparison of the BART Benchmark to the BART Alternative, Utah used the annual average of 2012-2013 NO_x emissions data for Hunter Unit 3 to reflect the BART Alternative and Utah used the annual average of NO_x emissions over 2001-2003 to reflect Hunter Unit 3's emissions over the BART Benchmark.[149] However, the 2012-2013 annual average NO_x emissions were the lowest 2-year average emissions at Hunter Unit 3 since the low NO_x burners were installed and the unit became subject to a 0.34 lb/MMBtu NO_x limit.[150] Table 15 below shows the 2-year average NO_x emissions, NO_x rate (in lb/MMBtu), and heat input for each of the two calendar year periods beginning in 2009, which are all well after the low NO_x burners were installed at Hunter Unit 3. I have also included the average over the 2001-2003 baseline period for comparison.

Table 15. Annual Average NOx and Heat Input Data During 2001-2003 Baseline Period and During Each Two Year Period Beginning 2009 to 2015 at Hunter Unit 3.[176]

Two Year Period	Annual Average NOx, tpy	Annual Average NOx Rate, lb/MMBtu	Annual Average Heat Input, MMBtu/yr
2001-2003	6,530	0.398	32,329,389
2009-2010	5,571	0.306	35,703,190
2010-2011	5,538	0.302	35,867,470
2011-2012	4,840	0.290	32,303,896
2012-2013	***4,622***	***0.282***	***31,895,777***
2013-2014	4,849	0.286	33,297,644
2014-2015	4,982	0.284	34,541,416

[176] Based on data reported to EPA's Air Markets Program Database, see Spreadsheet with Hunter Unit 3 Emissions (Ex. 65) at tab "Hunter Unit 3 Annual Emissions."

As shown in Table 15 above, by using the 2012-2013 timeframe to define NO_x emissions at Hunter Unit 3 with low NO_x burners/overfire air for the BART Alternative emissions calculations, Utah has selected the timeframe with the lowest annual average heat input, the lowest annual average NO_x emission rate after installation of low NO_x burners/overfire air, and

[149] 81 FR 2004, 2015 (Jan. 14, 2016)(specifically Table 3, notes 2 and 3).
[150] Pursuant to the March 13, 2008 Approval Order, DAQE-AN0102370012-08, at 9, Condition 11.B.2.a. (Ex. 64).

thus this time period also has the lowest annual average NO_x emissions. Had Utah selected the 2009-2010 timeframe to reflect the BART Alternative for Hunter Unit 3, the NO_x reductions between the BART Benchmark and the BART Alternative would be about half of the NO_x emission reductions, or 949 tpy, that Utah is claiming by using 2012-2013 to define Hunter Unit 3's NO_x emissions under the BART Alternative.

Utah has not provided support as to why the 2012-2013 timeframe is representative of future annual NO_x emissions at Hunter Unit 3. There are not any emission limitations or operational restrictions that would keep Hunter Unit 3 from emitting NO_x as high as it did in the 2009-2011 period. In fact, under 0.34 lb/MMBtu NO_x limit, Hunter Unit 3 could have NO_x emissions as high as that which occurred during the 2001-2003 baseline if the unit operated at 90% capacity factor. Specifically, the maximum hourly heat input capacity of Hunter Unit 3 as reported to Utah in 2007 was 4,910 MMBtu/hr.[151] Thus, assuming Hunter Unit 3 could emit NO_x at a rate as high as 0.34 lb/MMBtu, the Unit's NO_x emissions could exceed 6,530 tpy if the unit operated 90% of the hours in a year.[152]

In summary, EPA must require Utah to justify why it is appropriate to use 2012-2013 annual average NO_x emissions in the emissions comparison presented in Table 3 of EPA's proposed rulemaking. Based on the annual average emissions data in Table 15 above, which reflects Hunter Unit 3's actual annual average emissions after installation of the low NO_x burners/overfire air, it seems that Utah's projection of NO_x emissions for Hunter Unit 3 in the BART Alternative are unreasonably low.

Response: We disagree that Utah's NO_x annual emissions for Hunter Unit 3 under the BART Alternative are unreasonably low. At the time Utah developed its analysis in support of the BART Alternative, the most two full years of annual emissions data available in EPA's AMPD database were for 2013 and 2013. Therefore, it was reasonable for Utah to select the annual average of these two years as the basis for the Hunter 3 post LNB-upgrade. Even still, if instead a longer, more recent time period of 2011-2015 is used in order to address year-to-year variability, the five year average annual emissions from Hunter Unit 3 would be 4,897 tons per year – which is only 275 tons, or 6%, higher than the 4,622 tons per year rate assumed by Utah.[153] Accordingly, we find that the annual emissions assumed by Utah in its analysis of the BART are reasonable.

Comment: [Conserv Orgs -- Stamper Report, p. 52]
Utah's Assumed Annual SO_2 ***Emissions Under the BART Alternative Are From a Timeframe Not Representative of Typical Emissions from the Carbon Plant.***
As discussed in great detail in Section I.B.1 of this report, the Carbon plant had been burning coal with sulfur content that was relatively higher than the sulfur content of the coals historically utilized at the plant during 2010-2015. That medium sulfur coal was coming from the West Ridge mine, which is slated for closure this year. By using 2012-2013 SO_2 emissions to reflect the SO_2 emissions reduction from the shutdown of the Carbon plant, Utah has selected the

[151] July 19, 2007 Letter from PacifiCorp Energy to Utah Division of Air Quality, at 2 (Ex. 66).
[152] 4,910 MMBtu/hr x 0.34 lb/MMBtu x 8,760 hours/year x 0.90 (capacity factor) x (1 ton/2000 lb) = 6,581 tpy.
[153] Refer to spreadsheet prepared by EPA titled "Hunter and Huntington annual emissions.xlsx" located in the docket.

timeframe with close to the highest SO_2 emissions from the plant. Table 16 below shows how the annual SO_2 emissions at the Carbon units, as well as the average of 2001-2003 (reflecting the baseline timeframe of the regional haze plan), the average of 2001-2014, the median value of 2001-2014, and the 2012-2013 average SO_2 emissions used by Utah to reflect the emissions reduced with the shutdown of the Carbon plant.

Table 16. Annual SO2 Emissions from Carbon Units 1 and 2, 2001 to 2014[179]

Year	Carbon Unit 1 SO2 (tons/yr)	Carbon Unit 2 SO2 (tons/yr)	Plantwide SO2, tons/yr
2001	2,088	3,100	5,187
2002	2,721	4,043	6,764
2003	2,048	3,440	5,488
2004	2,060	3,581	5,642
2005	2,089	3,321	5,410
2006	2,860	3,919	6,779
2007	2,447	4,065	6,511
2008	2,137	2,920	5,057
2009	1,972	3,522	5,494
2010	3,022	4,440	7,462
2011	2,999	4,741	7,740
2012	3,507	4,800	8,307
2013	3,268	4,434	7,702
2014	3,798	5,443	9,241
2001-2003 (reflective of baseline date of Utah Haze Plan)	2286	3,528	5,813
2001-2014 Median	2,584	3,981	6,638
2001-2014 Mean	2,644	3,983	6,627
2012-2013 Average Used by Utah	*3,388*	*4,617*	*8,005*

[179] Data from EPA's Air Markets Program Database (Ex. 67).

Based on the rationale for developing more typical maximum daily SO_2 rates to model for each Carbon unit as discussed in Section I.B.1. above, the median annual SO_2 emission rate would be a better indication of the central tendency of the annual SO_2 emissions data over 2001-2014.

Response: Refer to our responses elsewhere in relation to the annual SO_2 emissions that Utah assumed in its BART Alternative analysis.

Comment: [Conserv Orgs -- Stamper Report, p. 53]

Utah Should Not Be Allowed Credit for Emissions Reductions Due to the Shutdown of the Carbon Plant that Exceed the Plant's Emissions During the Baseline Period of the Regional Haze Plan.

Given that emissions changes in regional haze plans are typically evaluated from the baseline period for the regional haze plan, Utah should not be allowed any more emissions reduction credit for the shutdown of the Carbon units than existed at the time of the baseline date of the regional haze SIP. Those emissions are most properly reflected in the 2001-2003 average, the same averaging period that Utah used to measure emission reductions from for Hunter Unit 3.[154] In Table 17 below, the 2001-2003 average for SO_2 and NO_x emissions at each Carbon unit is provided.

Table 17. 2001-2003 Annual Average SO2 and NOx Emissions From Carbon Units 1 and 2[181]

Year	Carbon Unit 1 SO2, tons/year	Carbon Unit 1 NOx, tons/year	Carbon Unit 2 SO2, tons/year	Carbon Unit 2 NOx, tons/year
2001	2,088	1,282	3,100	1,844
2002	2,721	1,377	4,043	2,001
2003	2,048	1,278	3,440	2,087
2001-2003 average	**2,286**	**1,312**	**3,528**	**1,977**
Compare to 2012-2013 Average used by Utah	*3,388*	*1,408*	*4,617*	*1,940*

[181] Data from EPA's Air Markets Program Database (Ex. 67).

The emission reduction credit allowed for the shutdown of the Carbon units should be no higher than the annual average SO_2 and NO_x emissions shown in Table 17 above, which reflect the 3 year average of Carbon Units 1 and 2's annual emissions at the time of the baseline date of the Utah regional haze plan.

Response: There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs -- Stamper Report, p. 54]

Under the BART Benchmark, It Was Unreasonable to Assume that the Carbon Units Could Emit SO_2 ***at Uncontrolled Emission Rates.***

[154] 81 FR 2004, 2015(specifically Table 3, fn 2).

As discussed in Section I.B.2 above, had the Carbon units continued to operate past April 15, 2015, the units would have had to meet the MATS rule in 40 C.F.R. Part 63, Subpart UUUUU. The MATS rule includes a limit on acid gas hazardous air pollutants (HAPs) or a limit on SO_2 emissions as a surrogate for acid gas HAPs.

Assuming that the Carbon units would choose to comply with the SO_2 surrogate emission limit of 0.20 lb/MMBtu, the Carbon units should have been evaluated in the BART Benchmark at the annual SO_2 emission levels shown in the Table 18 below.[155]

Table 18. Projected Annual SO2 Emissions of Carbon Units 1 and 2 under MATS Surrogate Standard for Acid Gases[183]

	SO2 under SO2 MATS Acid Gas Surrogate Standard, tpy[184]
Carbon Unit 1	594 tpy
Carbon Unit 2	901 tpy

[183] 40 C.F.R. Part 63, Subpart UUUUU, Table 2.

[184] Calculated based on 2001-2003 annual average heat input and the acid gas surrogate SO_2 limit of 0.20 lb/MMBtu.

Thus, for the Carbon units to operate past April 15, 2015 and comply with the SO_2 surrogate limit for acid gases under the MATS rule, annual SO_2 emissions should have been projected in Table 18 above.

Response: There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a State must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs -- Stamper Report, pp. 54-56]

The PM_{10} ***Emissions Assumed for the Carbon Units Appear Unrealistically High.***

The PM_{10} annual emission rates for Carbon Units 1 and 2 assumed by Utah, as shown in Table 3 of EPA's January 14, 2016 proposed rulemaking, seem unrealistically high. The PM_{10} emissions data are based on the 2012, Utah Department of Air Quality Annual Inventory.[156]
The 2012 Utah Annual Inventory does not appear to be included in Utah's 2015 SIP submittals, and thus it is unclear whether the PM_{10} emissions reflect filterable PM_{10} emissions or how those emissions were calculated. Utah's statewide 2011 emissions inventory is available on Utah's

[155] Alternatively, the Carbon units could have complied with the 0.002 lb/MMBtu hydrogen chloride MATS limit instead of the 0.20 lb/MMBtu SO2 acid gas surrogate limit but, either way, a reduction in SO2 would be expected as a co-benefit of controlling HCl emissions or through direct compliance with the SO2 acid gas surrogate limit. Thus, it was assumed that the Carbon units if operated under MATS would comply with the 0.2 lb/MMBtu SO2 MATS limit.

[156] 81 FR 2004, 2014 (Jan. 14, 2016)(specifically Table 3, fn 4).

website, and the PM_{10} emissions are based on primary PM_{10} (i.e., filterable PM_{10}).[157] So it is assumed that Utah's 2012 Annual Inventory and the PM_{10} emissions identified for the Carbon units are reflective of filterable PM_{10} emissions.

Using the annual average of 2012-2013 heat input at each Carbon unit, the 221 tpy and 352 tpy filterable PM_{10} emission levels are reflective of filterable PM_{10} emission rates of 0.075 lb/MMBtu at Carbon Unit 1 and 0.085 lb/MMBtu at Carbon Unit 2. These are very high filterable PM_{10} rates based on the coal utilized at the Carbon units and each unit being equipped with an ESP (with Unit 1 also being equipped with a cyclonic dust collector).[158]

As another method for calculating PM_{10} emissions from the Carbon units, I used the coal quantity and coal quality data provided by the EIA on its coal data browser website.[159] The coal quality data for each mine that supplied coal to Carbon, which is available for the 2009-2013 timeframe, include ash content and tons of coal provided to the Carbon plant. Based on that data and EPA's AP-42 emission factor for controlled PM_{10} based on ash content of coal and the ESPs at Carbon Units 1 and 2[160], I calculated plantwide filterable PM_{10} emissions for the Carbon units based on the tons of coal from each mine shipped to the Carbon plant. The results of those calculations are provided in Table 19. Because the EIA data does not distinguish between how much coal each unit utilized, I only was able to calculate plantwide emissions.

Table 19. Calculated Filterable PM10 Emissions Based on Coal Data Compared to Utah's 2012 PM10 Emissions for the Carbon Units 1+2

Time Period	Filterable PM10, based on ash content and tons of coal burned, tpy[190]
2012	185
	Utah's PM10 Emissions Based on 2012 Annual Inventory[191]
2012	*573*

[190] Calculation of Filterable PM_{10} Emissions from EIA Data on Coal Shipped to Carbon Plant (Ex. 47).
[191] 81 Fed. Reg. 2015 (Jan. 14, 2016), Table 3. As stated above, it appears that the PM_{10} emissions data reported in Utah's annual inventory is primary PM_{10} (i.e., filterable PM_{10}). http://www.deq.utah.gov/ProgramsServices/programs/air/emissionsinventories/docs/2013/03Mar/2011%20StatewidePointSources-DetailByCounty.pdf (last accessed March 8, 2016).

[157] Utah Department of Environmental Quality, *2011 Statewide Point Sources by County, Tons / Year*, available at http://www.deq.utah.gov/ProgramsServices/programs/air/emissionsinventories/docs/2013/03Mar/2011%20StatewidePointSources-DetailByCounty.pdf (last accessed March 8, 2016).
[158] *See* Title V Operating Permit, PacifiCorp Carbon Power Plant, Last Revised July 3, 2008, Permit Number 700002003, at 2 (Ex. 30).
[159] Energy Information Administration, Coal Data Browser, available at http://www.eia.gov/beta/coal/data/browser/#/shipments/plant/3644/?freq=A&pin=.
[160] US EPA, Compilation of Air Pollutant Emission Factors, AP-42 Table 1.1-6(stating that controlled PM10 emission factor for boilers with ESPs of 0.054A (where A = Ash content, %)).

As the above table demonstrates, the total PM_{10} emissions assumed by Utah for Carbon Units 1 and 2 are three times higher than the PM_{10} emissions calculated based on actual coal quality and tons of coal supplied to the Carbon plant.

Because the EIA data reflects coal shipped to the Carbon plant in each year, it may not necessarily reflect the total amount of coal burned at the Carbon plant because some coal from existing coal storage piles could be utilized as well. Thus, in addition to calculating PM_{10} emissions from the EIA data on coal shipped to the Carbon plant, I also calculated annual heat input of the coal shipped to Carbon based on the tons of coal and average heat value data in the EIA database. For 2012, the year used by Utah to reflect Carbon's PM_{10} emissions, the heat input based on tons of coal shipped to Carbon and heat value data was 14,254,404 MMBtu.[161] The total plantwide heat input reported to the Air Markets Program Database for the Carbon plant in 2012 was 14,946,131 MMBtu.[162] Thus, the Air Markets Program Database, which is based continuous emission monitoring data, reflects annual heat input that is 4.9% higher than calculated heat input based on tons of coal shipped to the Carbon plant. Further, there can also be a difference between heat input calculated from coal data compared to heat input measured by CEMs [continuous emission monitoring systems]. However, even if those issues exist, the calculated emissions of PM_{10} based on actual coal quality data and tons of coal burned would not be significantly higher than shown in the above table.

Based on the calculations of filterable PM_{10} from the EIA coal supply and coal quality data, 2012 is the highest year of filterable PM_{10} emission out of the years of coal data available in the EIA database (i.e., 2009 to 2013). As discussed in Section I.B.3.b. above, credit for emission reductions should be based on emissions changes as of the baseline date for the regional haze plan. However, coal shipment and ash content data for the coals utilized by the Carbon plant is not readily available[163] and therefore more recent coal data was used. Given that emission credit for BART and the BART alternative is typically based on a 2 to 3 year average of emissions, the 2012 filterable PM_{10} emissions calculated from coal data shipped to the Carbon plant is a reasonable maximum level of filterable PM_{10} emissions reduction credit to allow for the shutdown of Carbon Units 1 and 2.

In summary, Utah appears to have significantly overstated the PM_{10} emissions from the Carbon plant in 2012. It is also unclear whether the data to justify these emission totals is in the record for the BART alternative. Based on the analysis of EIA data as summarized in Table 19 above, EPA should not allow any more filterable PM_{10} emissions reduction credit for the shutdown of the Carbon units than 185 tpy.

Response: We disagree that Utah significantly overstated the PM_{10} emissions from the Carbon plant. The commenter incorrectly assumes that primary PM_{10} equates to filterable PM_{10}. Instead,

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[161] Calculation of Filterable PM10 Emissions from EIA Data on Coal Shipped to Carbon Plant (Ex. 47).
[162] EPA's Air Markets Program Database, see Table 9 in this document.
[163] The EIA did collect data on heat value, ash content, and tons of coal used for each power plant unit in the 2001-2003 timeframe, but that data was not reported based on each mine that supplied coal to the plant. Instead, a single value for ash content and heat content for each year was reported. Use of the EIA data which shows the tons of coal shipped, as well as ash and heat value in each mine's coal, provides for a more accurate and complete determination of actual filterable PM10 emissions from the Carbon plant.

primary PM_{10} refers to particles emitted directly into the atmosphere by the source and includes both filterable and condensable particles. (This is in contrast to secondary particulate matter that forms in the atmosphere due to complex chemical reactions that occur downwind of the source, e.g., ammonium sulfate). The commenter has only calculated the filterable PM_{10} fraction, and not the condensable PM_{10} fraction, of emissions from the Carbon units. The condensable PM_{10} fraction can be calculated using the emission factors included in Table 1.1-5 of AP-42 and is often higher than the filterable fraction. Therefore, we find that the commenters analysis is incomplete and does not establish that Utah overestimated the PM_{10} emissions form the Carbon units.

Comment: [Conserv Orgs -- Stamper Report, pp. 56-58]

Revised Comparison of Emissions Under BART Benchmark and Under BART Alternative.

Based on the above comments, I have prepared a table of revised projections of emission reductions from the shutdown of the Carbon units under the BART Benchmark and under the BART Alternative. These tables are revisions to the data presented by EPA in Table 3 of its proposed rulemaking on the Utah SIP.[164] No changes to emissions for other emission units are reflected in these revised tables.

Table 20. Revised Estimated Emissions Under BART Benchmark and BART Alternative, Based on 2001-2003 SO2 and NOx Emissions and Revised Filterable PM10 Emissions for the Carbon Units.

Units	NOx Emissions (tpy)		SO2 Emissions (tpy)		Filterable PM10 Emissions (tpy)		Combined	
	Bench-mark	Alter-native	Bench-mark	Alter-native	Bench-mark	Alter-native	Bench-mark	Alter-native
Carbon 1	1,312	0	2,286	0	185	0	9,288	0
Carbon 2	1,977	0	3,528	0				
Hunter 1	775	3,412	1,529	1,529	169	169	2,473	5,110
Hunter 2	843	3,412	1,529	1,529	169	169	2,541	5,110
Hunter 3	6,530	4,622	1,033	1,033	122	122	7,685	5,777
Huntington 1	809	3,593	1,168	1,168	176	176	2,153	4,937
Huntington 2	856	3,844	1,187	1,187	200	200	2,243	5,231
Total	*13,102*	*18,883*	*12,260*	*6,446*	*1021*	*836*	*26,383*	*26,165*

As the revisions to EPA's Table 3 presented in Table 20 above demonstrate, the use of Carbon plant actual emissions over the baseline date of the regional haze plan (i.e., 2001-2003 annual average) shows that the BART Benchmark would result in 5,781 tpy ADDITIONAL NO_x, emissions reductions compared to the BART Alternative. However, the BART Alternative would provide for a 5,814 tpy REDUCTION in SO_2 emissions over the BART Benchmark. And the BART Alternative would provide for a 185 tpy REDUCTION in filterable PM_{10} than the BART Benchmark.

The total of $SO_2 + NO_x + PM_{10}$ emissions for the BART Benchmark is 218 tpy greater than the total of $SO_2 + NO_x + PM_{10}$ emissions for the BART Alternative. Put another way, in total, the BART Alternative would result in a 0.8% reduction in total emissions of $SO_2 + NO_x + PM_{10}$ from the Carbon, Hunter, and Huntington units compared to the BART Benchmark. The above table is

[164] 81 FR 2004, 2015 (Jan. 14, 2016)(Table 3).

a more appropriate analysis of emissions changes at the Carbon units based on the 2002 baseline date of the SIP.

By using emissions for the Carbon units over the 2012 -2013 timeframe in its comparison of emission reductions achievable under BART compared to the BART alternative, Utah is not meeting the requirements of 40 C.F.R. §51.308(e)(2)(iv) that emission reductions resulting from the BART alternative "will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP." EPA has explained that the "baseline date of the SIP" in this context means "the date of the emissions inventories on which the SIP relies" which is "defined as 2002 for regional haze purposes."[165] As discussed in Section I.B.1. above, the Carbon units had been burning relatively higher sulfur coal in the 2010-2014 timeframe than the coal sulfur content historically utilized at the plant. That increased sulfur content resulted in an increase in SO_2 emissions above the 2002 emission inventories upon which the Utah regional haze SIP is based. Utah should not be allowed emissions reduction credit for the shutdown of the Carbon units at emission levels that exceeded the emissions as of the 2002 baseline date of the regional haze plan. That would allow Utah to take credit for SO_2 emission increases at the Carbon plant above the 2002 baseline for the regional haze plan emission inventory, and such emission reductions at a level that exceed the 2002 baseline emission inventory cannot be considered surplus.

Further, under the BART Benchmark scenario, it is assumed that the Carbon units would continue operation while Hunter Units 1 and 2 and Huntington Units 1 and 2 installed SCR to meet NO_x BART. However, the Carbon units could not operate past April 2015 without complying with MATS. Assuming the Carbon units complied with the SO_2 surrogate limit of 0.20 lb/MMBtu for the acid gas HAPs[166], the SO_2 emissions from the Carbon units under the BART Benchmark scenario would be much lower as shown in Table 21 below.

Table 21. Revised Estimated Emissions Under BART Benchmark and BART Alternative, Based on MATS Compliance for Acid Gas HAPS (Using SO2 Surrogate Limit), 2001-2003 NOx Emissions, and Revised Filterable PM10 Emissions for Carbon Plant.

Units	NOx Emissions (tpy)		SO2 Emissions (tpy)		Filterable PM10 Emissions (tpy)		Combined	
	Bench-mark	Alter-native	Bench-mark	Alter-native	Bench-mark	Alter-native	Bench-mark	Alter-native
Carbon 1	1,312	0	594	0	185	0	4,969	0
Carbon 2	1,977	0	901	0				
Hunter 1	775	3,412	1,529	1,529	169	169	2,473	5,110
Hunter 2	843	3,412	1,529	1,529	169	169	2,541	5,110
Hunter 3	6,530	4,622	1,033	1,033	122	122	7,685	5,777
Huntington 1	809	3,593	1,168	1,168	176	176	2,153	4,937
Huntington 2	856	3,844	1,187	1,187	200	200	2,243	5,231
Total	*13,102*	*18,883*	*7,941*	*6,446*	*1021*	*836*	*22,064*	*26,165*

[165] *See* 77 FR 39938, 39941 (July 6, 2012)(quoting EPA's 1999 Regional Haze Rulemaking and EPA's BART Guidelines rulemaking at 64 FR 35742 (July 1, 1999) and 70 FR 39143 (July 6, 2005)).
[166] 40 C.F.R. Part 63, Subpart UUUUU, Table 2.

Table 21 above represents a more realistic BART Benchmark scenario for the Carbon plant, because the Carbon units could not operate past April 15, 2015 without complying with the MATS rule. As the table demonstrates, a comparison of emissions under these two scenarios shows that the BART Alternative (with MATS compliance) would result in a 1,495 tpy reduction in SO_2 from the Carbon units. But the total emissions of SO_2 + NO_x + filterable PM_{10} under the BART Benchmark scenario would be 4,101 tpy LOWER than the total emissions of these three pollutants under the BART alternative.

Response: There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a State must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [NPS Tech, pp. 21, 23] We are puzzled by EPA's statement (highlighted in bold below) which does not appear to be consistent with results reported in Table 8 of Utah SIP revision[167] or Table 12 of Federal Register:

> Utah reported that the only metric it evaluated that showed greater improvement for the BART Benchmark in comparison to the BART Alternative was the 98th percentile metric (when averaged across all Class I areas and meteorological years modeled). Utah's comparison of the modeled visibility impacts on the 98th percentile day (8th highest impacted day in a given meteorological year) for the most impacted year shows that **the BART Benchmark would result in greater visibility improvement at five of the nine Class I areas, and is slightly better on average across all nine Class I areas (0.11 dv difference)**. At the most impacted Class I areas, Canyonlands and Capitol Reef, Utah found that the 98th percentile metric indicates the BART Benchmark has 0.76 dv and 0.57 dv, respectively, more improvement than the BART Alternative. At other Class I areas, Utah found that the 98th percentile metric indicates that the BART Alternative provides greater visibility improvement (for example, 0.44 dv at Flat Tops).

UDAQ's SIP Table 8 shows that BART would result in greater visibility improvement at six of the nine Class I areas and is better on average across all nine Class I areas (0.15 dv difference). Our modeling analysis (see table below) shows that BART would result in greater visibility improvement at seven of the eight Class I areas we modeled, and is better on average across all nine Class I areas (0.17 dv difference) when UDAQ's results for Flat Tops are included. At the most-impacted Class I areas, Canyonlands and Capitol Reef, we found that the 98th percentile metric indicates BART has 0.72 dv and 0.63 dv, respectively, more improvement than the BART Alternative.

However, EPA's proposal "to find that these observations suggest that the BART Alternative is likely to achieve greater reasonable progress" undermines the BART process and is inconsistent with its own comments. When evaluated objectively on their merits, EPA's observations do not "suggest" that, as EPA states, "the BART Alternative is *likely* to achieve greater reasonable

[167] Air Quality Modeling Protocol: Utah Regional Haze State Implementation Plan, February 13, 2015.

progress." (emphasis added). EPA's valuation of the importance of the BART Alternative achieving "greater SO_2 and PM_{10} emissions reductions" is contradicted by its own statement: However, as EPA explained in responding to comments in the final rule for the BART Alternative for the Apache Generating Station in Arizona's SIP, ''where BART and the BART Alternative result in reduced emissions of one pollutant but increased emissions of another, it is not appropriate to use the 'greater emission reductions' test.'' Instead, the proper approach is to employ a clear weight-of-evidence approach under 40 CFR 51.308(e)(2) in order to demonstrate that the alternative achieves greater reasonable progress than BART.[168]

Furthermore, in evaluating a BART Alternative for the Tesoro Refinery in Washington, even though there would be a greater reduction in annual SO_2 than in NO_x, EPA required a modeling analysis to demonstrate that the greater SO_2 BART Alternative reductions did, indeed, result in greater visibility improvement than the lesser NO_x BART reductions. The Utah BART Alternative is just such a case where one pollutant (SO_2) decreased but another pollutant (NO_x) increased, and, as EPA states, "…it is not appropriate to use the 'greater emission reductions' test.'' Based upon EPA's previous statements, policies, and precedents, EPA should not consider this comparison of annual emissions in its analysis.

Response: From Table 12 in Utah's Staff Report located in the TSD to the State's SIP revision, the BART Benchmark does indeed show lower impacts at 5 of the 9 class I areas listed.

Comment: [UARG, p. 5] Utah's recognition of the significantly greater sulfur dioxide ("SO_2 ") emission reductions, as well as the larger PM_{10} emission reductions and the greater overall emission reductions, that are attributable to the BART Alternative strongly support a finding that the BART Alternative will achieve greater reasonable progress than would BART.

Response: The response to this comment is provided in the FRN and elsewhere in this RTC document.

Comment: [Conserv Orgs, p. 30] Similar to the Carbon Plant, Utah's projected emissions reduction analysis assumes, under the Most Stringent NO_x scenario, that Hunter Unit 3 could emit NO_x emissions without operating its 2008 low-NO_x burners and the corresponding permitted emissions limit. There is no evidence supporting Utah's assumption that PacifiCorp plans to, or could, remove its 2008 LNBs and defy the corresponding already-permitted NO_x emissions limit.

In fact, when the proper post-2008 Hunter 3 NO_x emissions reductions are included in the "Most Stringent NO_x " scenario, it becomes clear that Utah's BART Alternative does not result in greater emissions reductions, or greater reasonable progress, than would installation of SCR BART controls on the Hunter and Huntington BART units.

When emissions reductions are properly calculated, the BART Benchmark is demonstrably superior to Utah's BART Alternative. Based on the comments in Vicki Stamper's March 14, 2016 TSD (pp. 43-58), below are tables of revised projections of emission reductions from the shutdown of the Carbon units under the BART Benchmark and under the BART Alternative.

[168] 40 CFR Part 52 [EPA–R08–OAR–2015–0463; FRL—9939–43–Region 8]; 81 FR 2004, 2028.

These tables are revisions to the data presented by EPA in Table 3 of its proposed rulemaking on the Utah SIP.[169] No changes to emissions for other emission units are reflected in these revised tables.

Table 4. Revised Estimated Emissions Under BART Benchmark and BART Alternative, Based on 2001-2003 SO2 and NOx Emissions and Revised Filterable PM10 Emissions for the Carbon Units.

Units	NOx Emissions (tpy)		SO2 Emissions (tpy)		Filterable PM10 Emissions (tpy)		Combined	
	Bench-mark	Alter-native	Bench-mark	Alter-native	Bench-mark	Alter-native	Bench-mark	Alter-native
Carbon 1	1,312	0	2,286	0	185	0	9,288	0
Carbon 2	1,977	0	3,528	0				
Hunter 1	775	3,412	1,529	1,529	169	169	2,473	5,110
Hunter 2	843	3,412	1,529	1,529	169	169	2,541	5,110
Hunter 3	6,530	4,622	1,033	1,033	122	122	7,685	5,777
Huntington 1	809	3,593	1,168	1,168	176	176	2,153	4,937
Huntington 2	856	3,844	1,187	1,187	200	200	2,243	5,231
Total	*13,102*	*18,883*	*12,260*	*6,446*	*1021*	*836*	*26,383*	*26,165*

Response: We disagree with the revised annual emission reduction calculations performed by the commenter, and therefore the conclusions they draw from them. See our response to similar comments elsewhere.

Comment: [Conserv Orgs, p. 60] Utah's BART Alternative Improperly Takes Credit for Historical Emissions Reductions from Hunter Unit 3 and Carbon

The Hunter 3 NO_x emissions reductions are not "resulting from" or "achievable under" Utah's BART Alternative. Utah points to no evidence in the administrative record indicating that 2008 NO_x emissions reductions at Hunter 3 were "resulting from" or "achievable under" Utah's BART Alternative. Nor could they be. Utah did not even propose its BART Alternative program until 2015—seven years ***after*** the Hunter 3 emissions reductions. Any claim by Utah that the Hunter 3 NO_x emissions reductions "resulted from" or were "achieved under" its newly proposed program lacks any factual support in the administrative record and is purely fiction.

Response: As explained by Utah in its response to a similar comment during the State's public comment period on the proposed SIP, the commenter is taking the terms "resulting from" and "achievable through" out of context. The rule does not require that the alternative program establish new emission reduction requirements. EPA specifically envisioned allowing states the flexibility to rely on emission reductions from other CAA requirements as part of an alternative program. The preamble to the proposed rule states, "[i]n some cases, emission reductions required to fulfill CAA requirements other than BART (or to fulfill requirements of a State law or regulation not required by the CAA) may also apply to some or all BART eligible sources. In such a situation a State may wish to determine whether the reductions thus obtained would result in greater reasonable progress than BART." (70 FR 44161) 40 CFR 51.308(e)(2)(iv) specifically

[169] 81 FR 2004,2015(Jan. 14, 2016) (Table 3).

allows the inclusion of measures adopted after the baseline date of the SIP (2002) to be included in the alternative program.

ii. Improvement in the Number of Days With Significant Visibility Impairment

Comment: [UDAQ, p. 12] EPA criticizes Utah's use of improvement in the number of days with significant visibility impairment) to support the BART Alternative because "averaging the number of days with impacts greater than 1.0 deciview across all affected Class I areas is not a relevant metric." 81 Fed. Reg. at 2029. The proposed rule further states that, because of averaging, "Utah's results for the total number of days with impacts over 1.0 deciview on a Class I area-by-area basis are not clear in supporting the BART alternative." *Id.* EPA has applied the average improvement metric consistently in other states as allowed in the RHR, and should do so in this case. *See e.g.* 80 Fed. Reg. 19,220-01 (April 10, 2015) (EPA concurring with Arizona Department of Environmental Quality's determination that the Apache BART Alternative would achieve greater reasonable progress than BART based on the improved visibility on average across all affected Class I areas.). Furthermore, averaging visibility improvement is the best way to measure because it counts each Class I area as equal. An evaluation that claims improvements at some sites are greater under BART versus the alternative, gives more importance to one Class I area over another.

Response: We agree with most of this comment, and our main response to it is provided in the FRN. We find that the results for the average number of days with impacts over 0.5 dv show that the BART Alternative is marginally better than the BART Benchmark while those for the 1.0 dv metric do not show the BART Alternative is better, primarily based on comparing the number of days between the two scenarios and the number of Class I areas that are favored by either of the scenarios in the analysis. While we find that averaging the results within this metric provides useful information about impacts in this situation, we view this as a case-by-case determination that could be evaluated differently depending on the circumstances of other BART alternatives.

Comment: [Conserv Orgs – Gray Report, pp. 7 - 8] Two of the visibility metrics Utah used consisted of counting the number of days in which the modeled visibility impact (delta dv) within each Class I area exceeded a specific threshold (0.5 dv and 1.0 dv). Although this metric provides information at two additional points within the distribution of daily impacts, these two points are somewhat arbitrary and can represent very different points on the distribution from one Class I area to the next. The number of days that exceeds each threshold provides an indication of the percentile level associated with the threshold. For example, if the modeled daily average delta dv exceeds 0.5 for 182 out of the 365 modeled days in a given year, then this represents (approximately) the 50th percentile, or median, impact at that Class I area. If, on the other hand, the modeled number of exceedances is 8 (out of 365), then the 0.5 delta dv represents (approximately) the 98th percentile impact. Depending on the modeled number of exceedances for a given threshold, the threshold may represent very different percentiles of the complete distribution of daily visibility impacts. If the modeled number of exceedances is high at a Class I area, then the threshold level does not represent a peak impact at the Class I area. In fact, the higher the exceedance counts, the lower percentile that the threshold level represents. If the modeled number of exceedances is low, representing just a few days in which the modeled

visibility impacts exceeded the threshold, then the threshold does represent a peak impact. However, if there are only a few days in which the modeled visibility impact exceeds the given threshold, then a relatively small change in emissions (for example when comparing the BART Alternative to the BART Benchmark) may result in one or more of the modeled daily impacts crossing over the threshold value (in either direction), depending on how close each modeled daily impact is to the threshold value.

The result is that the change in exceedance counts will go up or down based on the proximity to the threshold value of a few daily impacts. The difference in the exceedance counts when both values are relatively low is therefore an unstable statistic and is not very robust (i.e., there is a large uncertainty associated with the difference).If the annual exceedance counts for both of the compared scenarios are relatively high (e.g., dozens or hundreds of days) then the threshold value does not represent a peak visibility impact. If the exceedance counts are low (e.g., less than about 20), then the statistic is really only "usable" if the number of exceedances for one scenario is much greater than the other scenario (which would indicate that the threshold represents a peak impact for one scenario but a non-peak level for the other scenario). If both scenarios produce "similar" low exceedance counts, then the statistic is quite uncertain(and the comparison of the two scenarios is up to the "whims" of just a few daily averages that might happen to move up or down across the threshold level).The exceedance counts for a specific emission scenario represent very different percentile levels for each modeled Class I area (and therefore the simple addition of the exceedance counts across all the modeled Class I areas is problematic, in that each value represents a different percentile level). In addition, relatively high exceedance counts do not represent the peak of the distribution of visibility impacts. Finally, low exceedance counts, while representing peak impacts, are highly uncertain and so the difference between two relatively low exceedance counts is an unreliable metric. For these reasons, the exceedance counts should be given much lower weight than other more robust metrics which better represent peak impact levels and are less uncertain (such as the 98th percentile delta dv, or even the 90th percentile delta dv).

Response: We acknowledge the commenter's statistical considerations (i.e., strengths and weaknesses) pertaining to the State's metric that assesses the number of days with significant visibility impairment. While EPA considered this metric in our evaluation of the State's weight-of-evidence analysis because it relates to assessing the frequency and duration of visibility impacts, for the reasons explained in the FRN we found that the results for the average number of days with impacts over 0.5 dv show that the BART Alternative is marginally better than the BART Benchmark, while those for the 1.0 dv metric do not show the BART Alternative is better, primarily based on weighing the comparison in number of days between the two scenarios and the number of Class I areas that are favored by either of the scenarios in the analysis.

EPA's evaluation of the modeling metrics and our main response to related comments is provided in the FRN and elsewhere in this document.

Comment: **[Conserv Orgs – Gray Report, p. 15]** The BART Benchmark and BART Alternative scenarios result in almost the same number of days in which the modeled delta dv exceeds 1.0 at all Class I areas except Arches NP and Flat Tops Wilderness. The overall total difference for all Class I areas combined (6 days per year) is due to the higher impacts of Carbon

emissions at Arches NP (average of 9 days per year) and Flat Tops Wilderness (2 days per year). The average number of exceedances at the other seven parks are all within 2 days/year between the two scenarios, with the BART Benchmark scenario producing slightly better results at four of the Class I areas. Therefore, the results shown in Table 4 cannot be used to support the assertion that the BART Alternative scenario is "better than BART."

Table 4. Average Modeled Number of Days/Year with Delta dv ≥ 1.0

	Alternative	BART Benchmark	BART Benchmark vs. Alternative*
Arches National Park	68	77	-9
Black Canyon of the Gunnison National Park	10	9	1
Bryce Canyon National Park	9	8	0
Canyonlands National Park	87	87	0
Capitol Reef National Park	42	41	1
Flat Tops Wilderness	13	15	-2
Grand Canyon National Park	11	10	1
Mesa Verde National Park	13	12	2
Zion National Park	6	6	0
Total (All 9 Class I Areas)	**258**	**264**	**-6**

* Positive values favor BART Benchmark (lower modeled visibility impact); negative values favor Alternative

Response: We agree with the commenter that the BART Benchmark and the BART Alternative scenarios result in almost the same average number of days with modeled impacts over 1.0 dv, though we note there are some minor arithmetic errors in the commenter's referenced Table 4 (i.e., column 3 for Bryce Canyon and Mesa Verde). We find that this metric does not show the BART Alternative is better.

Comment: [PacifiCorp, p. 15] *Improvement in the Number of Days With Significant Visibility Impairment* EPA also properly recognizes that, when analyzing the total number of days for the years modeled, fewer days with significant visibility impacts will occur under the BART Alternative as compared to the BART Benchmark. See 81 FR at 2022. EPA describes this metric as "useful in assessing the frequency and duration of significant visibility impacts from a source or small group of sources." *Id.* In fact, EPA's model shows that the BART Alternative will produce 18 fewer days of impact above the causation threshold of 1.0 dv threshold, and 175 fewer days of impact above the contribution threshold of 0.5 dv.[170] *Id.* EPA thus concludes that such modeled improvements are "an indication that the BART Alternative achieves greater reasonable progress."[171] Id.

[170] EPA summarizes the number of days of impact differently at 81 FR 2004, 2024 where it concludes that there are 48 fewer days of impact of 1.0 dv or more, and 154 fewer days of impact of 0.5 dv or more, under the BART Alternative. Under either set of numbers, of course, the BART Alternative produces greater reasonable progress.
[171] EPA also should consider the average number of days above the noted thresholds as contained in Tables 5 and 6 of the Proposed Action (16 fewer days for 1.0 dv, and 58 fewer days for 0.5 dv under the BART Alternative). This additional evidence supports EPA's proposed conclusion that that BART Alternative demonstrates greater reasonable progress.

EPA's consideration of this type of information is consistent with 40 CFR 51, appendix Y (the "**BART Guidelines**"), where Section IV.D.5 states that, in determining BART, "comparison thresholds can be used in a number of ways in evaluating visibility improvements…."[172] As explained below, PacifiCorp encourages EPA to apply significant weight to this particular metric, including a conclusion that such modeling results show strong evidence of greater reasonable progress.

In any case, the use of this metric takes a holistic view of visibility improvement, which is deserving of significant consideration by EPA.[173] By comparison, the 98th percentile metric (addressed below) presents more of a rifle-shot metric that focuses on a single day[174] of visibility improvement and inherently is less reliable for evaluating the BART Alternative.

Response: EPA unintentionally created some confusion with regard to this metric in our proposed rule by expressing the improvement in the number of days with significant visibility impairment as the *total* number of days with visibility impairment greater than 1.0 and 0.5 dv in Tables 7 and 8, 81 FR 2004, 2017, based on modeling results presented in SIP TSD Ch. 6, Summary of Visibility Modeling. The State did not highlight these particular modeling results in this manner in its Utah Staff Review Report; rather, the State expressed this metric only as the average number of days per year over the three years modeled. However, because we included this information in our proposal, we consider it in our evaluation of the State's BART Alternative. We recognize that information shows that the BART Alternative will produce 18 fewer days of impact above the 1.0 dv threshold, and 175 fewer days of impact above the threshold of 0.5 dv. As we explained in the FRN, due to the small difference in the number of days above the 1.0 dv threshold and because impacts are location specific, we find that this information provides weak evidence and only marginally supports the Alternative. Additionally, we disagree with commenter's characterizations of the two thresholds as "causation" and "contribution". Such characterizations are inappropriate in the weight-of-evidence evaluation that considers whether the Alternative is better than BART. The weight-of-evidence evaluation does not consider whether a BART source "causes" or "contributes" to visibility impairment, which is how we characterize these thresholds when they are applied under the other source-specific BART determination provisions in the RHR.
(See footnote 29 in the FRN.)

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[172] *See* 81 FR 2004, 2022(including n. 84).

[173] Thus, EPA's criticism of this very metric in support of the FIP Proposal – and in particular the 18 days of fewer impacts over 1.0 dv – misses the mark. See 81 FR 2004, 2029. There, EPA admits that the 175 days of fewer visibility impacts over 0.5 dv holds up even under its trumped-up criticism (and therefore "the results of the 0.5 dv threshold favor the BART Alternative"). EPA goes on, however, to simply change the metric by which it evaluates the visibility benefit resulting from 18 fewer days over 1.0 dv of impact. (Total days across all Class I areas vs. average days at each Class I area.) In addition, EPA unilaterally ignores, under the FIP Proposal, the precedent it cites in support of the metric it uses to evaluate the SIP Proposal. EPA got it right the first time under the SIP Proposal, should stick with those metrics, and conclude that they support approval of the SIP Proposal.

[174] The Proposed Action recognizes the limitations of the 98th Percentile Impact analysis as compared to other metrics by stating that, "the annual average does provide an indication of the modeled visibility impacts for the entire year while the 98th percentile modeled results speak to a particular day (the 8th highest impacted day)." See 81 FR 2004, 2023 (emphasis added).

Our response to the comments regarding the use of the 98th percentile metric are addressed elsewhere.

Comment: [NPS Tech, pp. 24-25] Improvement in the Number of Days with Significant Visibility Impairment

Although EPA used "Improvement in the Number of Days With Significant Visibility Impairment" in North Dakota, Montana, and Washington, it did not do so in Arizona and Wyoming,[175] nor did it present "number of days" in its own modeling results for Utah. And, where EPA did include "number of days" in its analysis in some states, it used 0.5 dv as its criterion—not 1.0 dv as EPA proposes to accept in Utah.

"Number of days" is not a meaningful comparative statistic because it does not accurately account for improvements in visibility. For example, if the results of hypothetical control Scenario A show ten days at 0.9 dv impairment and hypothetical control Scenario B show ten days at 0.6 dv impairment, there would be no change in the number of days exceeding either 1.0 or 0.5 dv between the two scenarios, even though visibility has improved by 0.3 dv. On the other hand, if the results of Scenario A show ten days at 0.6 dv and Scenario B show ten days at 0.4 dv, the metric would show a reduction of ten days above the 0.5 dv impairment metric, even though the amount of visibility improvement is less (0.2 dv versus 0.3 dv).

EPA's statement is incorrect:

> Therefore, for this reason and because these metrics are supported by our regulations and past practice, we propose to find the State's use of these metrics is appropriate.

We do not find evidence where EPA in past practice has considered number of days greater than 1.0 dv in regional haze BART decisions; and "number of days greater than 0.5 dv" has been used by EPA only occasionally.

In the case of the UT BART Alternative, although UDAQ's Table 8 shows that BART achieves more visibility improvement at six (of nine) Class I areas, the numbers of days exceeding 0.5 dv (UDAQ Table 5) actually increase for each of those six improving Class I areas. Furthermore, the five Class I areas in UDAQ's Table 4 that shows a decrease in the number of days above 1.0 dv under BART all show an increase in the number of days above 0.5 dv in Table 5. This "number of days" method cannot be used to compare control strategies because it is too sensitive to the relationship of the model result versus the metric threshold and presents misleading results.

Our modeling analysis shows a similar "disconnect" at Canyonlands between 98th percentile impairment (see below) and "number of days." Even though the 98th percentile impairment drops from 4.8 dv under the BART Alternative to 4.0 dv under BART, the number of "days per year greater than 0.5 dv" increases from 122 to 127. EPA has given undue weight and credence

[175] In its Wyoming FIP, EPA stated, "The BART Guidelines recommend that visibility impairment be evaluated for the 98th percentile contribution for each BART source." EPA used the 98th percentile impacts but did not consider "number of days." In its Arizona FIPs, EPA stated, "As recommended in the BART Guidelines, the 98th percentile daily impact in deciviews is used as the basic metric of visibility impact." EPA made no mention of "number of days" in its Federal Register notices. (FN46 in NPS document).

in Utah to misleading metrics that are not statistically valid and that it has previously ignored (number of days greater than 1.0 dv) elsewhere.

Response: We acknowledge the commenter's statistical considerations (i.e., strengths and weaknesses) pertaining to the State's metric that assesses the number of days with significant visibility impairment. While EPA considered this metric in our evaluation of the State's weight-of-evidence analysis because it relates to assessing the frequency and duration of visibility impacts, we placed the most weight on the metric for the 98th percentile CALPUFF modeling results. We agree with the commenter that EPA has used the improvement in number of days with significant visibility impairment in a limited manner in other BART actions. However, contrary to the commenter's point on presentation of this information in our proposed action, we did present the "number of days" results for the modeling done to support our FIP. This information was provided in Tables 16, 17, 22 and 23 in our proposal. Regarding the commenter's points about specific impacts at Canyonlands, we disagree with some of the parameters used in the commenter's modeling and therefore, continued to rely on Utah's modeling for the BART Alternative and our own modeling for the FIP.

We also note that we took into consideration a second method the State used to address similar adverse comments it received from NPS. To address NPS's concerns, the State evaluated the number of days improved using a different methodology. Instead of focusing on the result (number of days with an impact above a certain threshold), the State's second methodology focused on the improvement (number of days that are improved by a specific amount). The State's second methodology analyzed the improvement from the baseline for the BART Alternative and BART Benchmark, and then evaluated the number of total days that were improved by a specific amount.[176] The State then grouped the results by deciview improvement. For example, "any improvement greater than or equal to 4 dv and less than 5 dv were included in the 4 dv category and so on."[177] The State selected six different thresholds for the second methodology, which included: 5, 4, 3, 2, 1, and 0.5 dv.[178] In summarizing the results, which appear in the State's Response to Comment document and the State's SIP, the State suggested that the "grouping showing dv improvement at 3 or greater are almost all days during the winter months of December – February. The largest number of days improved are found in the 1 dv group and the .5 dv group and contain days throughout the year, including the high visitation period of March – November."[179]

In evaluating the State's second methodology, whether the results favor the BART Alternative or the BART Benchmark vary greatly by visibility impact threshold and by Class I area. We found that this approach, while providing additional information regarding the visibility improvement on various days, is inconclusive in determining whether the BART Alternative achieves greater reasonable progress than the BART Benchmark.

[176] As noted in the State's "Response to Comments" at 24, "The visibility impairment in deciviews for each alternative was subtracted from the basecase impairment for each day in the three year modeling period."
[177] State "Response to Comments" at 24.
[178] State "Response to Comments" at 24.
[179] State "Response to Comments" at 25.

Also, as discussed elsewhere, in evaluating the seasonality of results for other metrics as the results relate to peak visitation at the Class I areas, we disagree with the State's consideration of visitation and seasonality in evaluating the number of days with changes in visibility at the six different thresholds under this metric and found that the visitation and seasonality aspects of this metric do not show that the BART Alternative is better than the BART Benchmark. We agree with the commenter that none of the FR notices they include in their comments considered the evidence from the 1.0 dv metric to evaluate those BART Alternative.

We respond to the other comments elsewhere.

Comment: [NPS Tech, p. 36] EPA's second primary element, improvement in the number of days with significant visibility impairment, is not a meaningful comparative statistic and has not been consistently applied by EPA in other actions.

Response: Our response to this comment is explained in greater detail elsewhere in our FRN and this document.

Comment: [UARG, p. 5] In particular, EPA is correct to agree with Utah's finding that the reduction in the number of days with significant visibility impairment, measured by the total number of days during which a 1.0 deciview ("dv") and a 0.5 dv threshold were exceeded in modeled meteorological years, supports the conclusion that the BART Alternative is better than BART.

Response: Our response to the role that the number of days with significant visibility impairment metric had in our final decision is found elsewhere in our FRN and this document.

Comment: [UARG, p. 18] [In the context of failing to grant the State deference], EPA criticizes Utah's reliance on the total number of days with impacts of more than 1.0 dv, arguing that this metric's averaging convention "obscur[es]" impacts at individual Class I areas and that the metric does not address whether the difference in impacts . *Id.*

Response: Our responses to similar comments are included in our FRN and this document.

Comment: [Conserv Orgs, p. 41] Further, Utah's reliance on the number of days with visibility impairment above identified thresholds (0.5 and 1.0 dv) also fails to support Utah's better-than-BART finding because it does not provide any indication of the *magnitude* of impacts on these days and does not depict peak impacts.[180]

Response: Our response to the role that the number of days with significant visibility impairment metric had in our final decision is found in our FRN and this document.

iii. 98th Percentile Impact (dv)

Comment: [UDAQ, pp. 12-13] Several commenters expressed concerns regarding the 98th percentile metric. One commenter explained that EPA assigns the most weight to the 98th

[180] *See* Gray Modeling Report, at 7-8.

percentile metric for two reasons: (1) this metric is recommended by the BART Guidelines, 40 C.F.R. 51, App'x Y, § IV.D.5; and (2) EPA has relied on this metric as a primary metric in evaluating prior regional haze BART alternatives. See 81 Fed. Reg. at 2022. Neither one of these reasons is persuasive. In fact, EPA recognizes the limitations of the 98th percentile metric in comparison with the annual average impact (discussed below) because the "98th percentile modeled results speak to a particular day (the 8th highest impacted day)," whereas the annual average provides "an indication of the modeled visibility impacts for the entire year." Id. at 2023. In other words, the annual average metric provides evidence of improvement throughout a much longer period of time. Further, BART Guidelines suggest that the 98th percentile impact is discretionary and the states "are free to determine the weight and significance" assigned to this metric. 40 CFR 51, Appendix Y, § IV.D.5 ("[T]he following is an approach that you may use to determine visibility impacts . . . ," which includes comparing "the 98th percent days for the pre- and post-control runs."). Thus, EPA places disproportionately great weight on this metric when it should only consider it as one of the factors in the "weight-of-evidence" analysis, and potentially not the most persuasive factor for the reasons explained above. Moreover, EPA should restrict its analysis to a review of whether Utah reasonably exercised the discretion afforded the State under the CAA regional haze provisions.
[PacifiCorp, p. 16] Another commenter explained that for the 98th Percentile Impact (dv) EPA asserts that:

> "The 98th percentile visibility impact is a key metric recommended by the BART Guidelines when selecting BART controls. In addition, this is one of the primary metrics that EPA has relied on in evaluating prior regional haze actions that have included BART alternatives. In the BART Guidelines, EPA described this metric as an appropriate measure in determining the degree of visibility improvement expected from controls. Therefore, we propose to find that it is an appropriate metric for assessing the relative benefits of the Utah BART Alternative here." See 81 FR at 2022.

In other words, the core reasons why EPA proposes to rely on the 98th percentile metric in evaluating the BART Alternative are because: (i) this metric is recommended in the BART Guidelines for determining BART; and (ii) EPA has used it in other regional haze actions that have include BART alternatives. Neither reason, however, requires EPA to consider the results of 98th percentile metric to be of more than marginal worth, especially given the flaws inherent in the use of the CALPUFF model.

Also, the BART Guidelines make clear that, even in the context of determining BART, states "are free to determine the weight and significance to be assigned" to this factor. In other words, even the BART Guidelines confirm that Utah could "determine the weight and significance" of the 98th Percentile metric, which is exactly what Utah did. This is another reason why, if EPA considers the 98th Percentile metric at all, it should give it only marginal weight to it in evaluating the BART Alternative.

[UARG, p. 6] A third commenter explained that the only metric evaluated by Utah that arguably suggests that the BART Alternative may not be better than BART is the 98th percentile dv impacts. Id. at 2022. Even that metric, however, shows only that the BART Benchmark might perform better than the BART Alternative at five of the nine affected Class I areas, a nearly even

split. EPA supplemented Utah's assessment with its own 98th percentile dv impacts evaluation. That evaluation appears to favor the BART Benchmark but also demonstrates that impacts vary based on "the particular Class I area and meteorological year modeled." Id. Further, both the state's analysis and EPA's analysis show that the differences in performance between the BART Alternative and the BART Benchmark are generally quite small. See, e.g., id. at 2023, Table 12. For these reasons, and in light of the evidence presented by the other evaluated metrics, Utah was right not to give controlling weight to the 98th percentile metric in its weight-of-evidence analysis.

[UARG, p. 7] The commenter further explained that EPA asserts that the 98th percentile metric is "a key metric recommended by the BART Guidelines" and therefore proposes to determine that that metric is appropriate "for assessing the relative benefits of the Utah BART Alternative here." Id. at 2022. EPA's apparent premise that, in this respect, the BART Guidelines provide clear direction for assessment of BART alternatives is mistaken. The BART Guidelines recommend use of the 98th percentile when making subject-to-BART and BART determinations for individual sources, see 70 Fed. Reg. at 39,121, 39,162, 39,170. Moreover, the rationale EPA provided in the BART Guidelines for using the 98th percentile in subject-to-BART determinations has no relevance to a comparison of dv impacts of a BART benchmark and those of a BART alternative. In recommending the 98th percentile value metric for certain BART purposes under the BART Guidelines – which do not govern determination of BART alternatives – EPA plainly was not requiring or even recommending use of that metric for BART alternatives. See, e.g., id. at 39,121 ("[W]e note that the 98th percentile value would only be used to determine whether a particular BART-eligible source would be subject to further review by the State. In determining what, if any, emission controls should be required, the State will have the opportunity to consider the frequency, duration, and intensity of a source's predicted effect on visibility."). Because EPA provides no basis for requiring or even preferring use of a 98th percentile evaluation for BART alternatives, and because EPA's BART and BART alternative rules properly emphasize states' discretion to use other appropriate metrics, EPA should recognize that it was reasonable for Utah to decide that, on balance, other metrics provided more reliable and more consistent information on which to base its better-than-BART determination. In addition, because only the 98th percentile metric suggested that the BART Benchmark may arguably be better than the BART Alternative, EPA should conclude that Utah's BART Alternative should be approved on the grounds, inter alia, that "by itself [that metric] is not a dispositive metric in weighing a BART Alternative." 81 Fed. Reg. at 2024.

[UARG, p. 19] Finally, the same commenter explained that EPA does the opposite with respect to the 98th percentile metric, artificially magnifying its significance while downplaying the mixed nature of its results. Indeed, as noted above, the 98th percentile metric shows a nearly even split in whether the BART Alternative or the BART Benchmark will result in greater improvements at affected Class I areas, and it shows different results in different years. See id. at 2029-30. EPA suggests without justification that the 98th percentile metric is the most relevant metric for evaluating BART alternatives. See id. at 2030. For the reasons explained above, the 98th percentile metric is not necessarily more reliable, and should not be portrayed in this rulemaking as more significant, than other metrics in the BART alternative evaluation context. Utah assigned appropriate weight to the 98th percentile metric, in the context of the more consistent results provided by other metrics it considered.

Response: We disagree with a majority of these comments.
We first provide a summary of the State's SIP and our proposal. Utah explained in its regional haze SIP submittal that the only metric it evaluated that showed greater improvement for the BART Benchmark in comparison to the BART Alternative was the 98th percentile metric when visibility impacts were averaged across all Class I areas and meteorological years modeled. Utah's comparison of the modeled visibility impacts on the 98th percentile day (8th highest impacted day in a given meteorological year) for the most impacted years showed that the BART Benchmark would result in greater visibility improvement at five of the nine Class I areas, and is better on average across all nine Class I areas (0.11 dv difference). At the most impacted Class I areas, Canyonlands and Capitol Reef, Utah found that the 98th percentile metric indicates the BART Benchmark has 0.76 dv and 0.57 dv, respectively, more improvement than the BART Alternative. At other Class I areas, Utah found that the 98th percentile metric indicated that the BART Alternative provided greater visibility improvement (for example, 0.44 dv at Flat Tops). We noted in our proposal that when calculating visibility improvements for individual Class I areas, Utah mixed the impacts from different meteorological years between modeling scenarios (baseline, BART Benchmark, and BART Alternative). For example, at Arches, Utah compared the impact of 4.87 dv in 2003 (the most impacted year) for the BART Benchmark to the result of 4.92 dv in 2001 (the most impacted year) for the BART Alternative. Utah's analysis determined the Class I area average favored the BART Benchmark by 0.11 dv.

Utah's methodology may show visibility improvements driven by year-to-year variability in meteorological conditions, as opposed to the differences in emission reductions between the BART Alternative and BART Benchmark. Therefore, to address the question of whether Utah's use of different meteorological data inputs for the two scenarios impacted the results, EPA revised Utah's analysis and calculated the visibility improvements for each modeling scenario using *consistent* meteorological data and years, and determined the Class I area average favored the BART Benchmark by 0.14 dv. Using either method, whether the BART Alternative resulted in lower 98th percentile impacts depended on both the particular Class I area and meteorological year modeled. In some years and some Class I areas, particularly some of the most impacted Class I areas, using consistent meteorological years, BART Benchmark shows better visibility improvement than the BART Alternative. Notably, using the EPA method, the BART Benchmark shows 0.93 dv greater improvement for Canyonlands in 2002 and 0.75 dv greater improvement for Capitol Reef in 2001. By contrast, the BART Alternative shows 0.90 dv greater improvement for Arches in 2003 and 0.43 dv greater improvement for Flat Tops in 2002. On the whole, when using the EPA method, the BART Benchmark is better on average across all years and nine Class I areas (0.14 dv difference). As noted earlier, Utah's analysis provides a comparable result (0.11 dv difference) also favoring the BART Benchmark. We refer to the result of 0.14 dv difference between the scenarios derived from the EPA method in the remainder of our evaluation, however, our conclusions regarding this metric would be the same had we instead relied on the State's analysis.

In the FRN we summarized our proposal as follows:

> In its regional haze SIP, the State determined that while the 98th percentile modeling impact showed greater reasonable progress under the BART Benchmark, several

considerations led to the State's conclusion that this metric does not give a complete picture of the visibility improvements that will be seen by visitors to Class I areas. Therefore, the State's summary of the weight-of-evidence did not include the results from the 98th percentile modeling impact. We assessed the State's evidence for this metric and proposed to find that on the whole, when using this method, the results from the BART Benchmark are slightly better on average across all years and nine Class I areas (0.14 dv average difference). Also, this metric shows greater visibility improvement at five of nine Class I areas for the BART Benchmark. We proposed to find, consistent with the State's evaluation, that this metric favors the BART Benchmark and does not show that the BART Alternative is better.

First, even assuming that EPA's proposed evaluation of Utah's BART Alternative SIP applied a new metric (i.e., the 98th percentile CALPUFF modeling results), our proposed action provided the public with the opportunity to comment. As evidenced by the commenters' submissions, the commenters had the opportunity to comment on EPA's approach to using the 98th percentile results to evaluate the Utah RH BART Alternative SIP and to identify any concerns associated with the approach and weight assigned to this metric.
Second we disagree with the State's and commenter's suggestion to either assign little or no weight to the 98th percentile CALPUFF modeling results. Use of the CALPUFF model and consideration the 98th percentile results is appropriate in this case for a number of reasons, including:

• In complex atmospheric chemistry analysis that in volves several pollutants (i.e., NO_x, SO_2 and PM_{10}) it is reasonable to consider modeled data to evaluate and compare emission control options.
• CALPUFF is an EPA-approved complex non-steady-sta te puff dispersion model that simulates the effects of time- and space-varying meteorological conditions and provides predictions on pollution transport, transformation, and removal.
• In considering the comments that we should disreg ard, or place less weight on, the results from CALPUFF, we considered the regulatory status of CALPUFF for visibility analyses. The requirements of 40 CFR 51.112 and 40 CFR part 51, Appendix W, Guideline on Air Quality Models (GAQM) and the BART Guidelines, which refer to GAQM as the authority for using CALPUFF, provide the framework for use of CALPUFF. The BART Guidelines recommend use of CALPUFF as a screening tool (for the subject-to-BART analysis). To use CALPUFF in a BART determination as part of a SIP or FIP, appropriate consultation/approval with the reviewing authority is required, which Utah received from EPA. The BART Guidelines cited and referred to EPA's GAQM, which includes provisions to obtain approval through consultation with the reviewing authority.
• We approved use of the CALPUFF model for the Utah SIP because it had been shown to be sufficiently documented, technically valid, used in other BART and BART alternative SIPs and FIPs, and reliable for use in a BART decision making process.
• The Utah BART Alternative uses SO_2 and PM_{10} emission reductions to substitute for the required NO_x BART emission reductions. Therefore, it is appropriate to use the results from the CALPUFF model to assess whether the pollutant substitutions (along with some of the NO_x emission reductions) under the Alternative provide for greater

reasonable progress than the BART Benchmark (which relies exclusively on the NO_x reductions).

• The BART Guidelines recommend use of the 98th per centile results from CALPUFF, which are used because they "effectively capture the sources that contribute to visibility impairment in a Class I area, while minimizing the likelihood that the highest modeled visibility impacts might be caused by unusual meteorology or conservative assumptions in the model."[181] Additionally, the 98th percentile results reasonably adjust for the uncertainties associated with the CALPUFF model.

Therefore, as discussed elsewhere, of all the information evaluated in the State's analysis and before us, the information from the 98th percentile metric has the greatest significance, and therefore, the evidence from this metric was assigned the highest value.

Third, we disagree with the State's concerns regarding the 98th percentile metric because it looks at the 8th highest impacted day in a given meteorological year, rather than averaging that day's impacts with all other days in a year, as under the annual average metric. Considering the 8th highest impacted day appropriately accounts for the visibility impacts of a single source, or a small group of sources, and the expected improvements resulting from emission reductions at those sources, as compared with an annual average approach which dilutes those impacts and improvements.

Fourth, we disagree with the State's suggestion that because the CALPUFF modeling did not take into account impacts from non-BART sources, the results do not give a complete picture of visibility improvements and therefore do not need to be considered. The BART requirements are source specific—the statute and our regulations focus on visibility improvements achievable via emission reductions from particular sources. In this case, the State used CALPUFF to compare its BART Alternative with the BART Benchmark in order to determine if the Alternative achieves greater reasonable. This inquiry focuses on the impacts of the sources included in the BART Benchmark on the one hand, and in the Alternative on the other. Impacts from the broader universe of non-BART sources are not part of this evaluation. If a state finds that visibility on certain days is impacted by non-BART sources, there are other provisions in the regional haze program to address the impacts from those sources.

Furthermore, BART is a technology-based requirement that either the BART sources must meet, or an Alternative must show that it is better than BART. Neither the CAA nor our rules allow a state to disregard the BART requirement because non-BART sources contribute to visibility impacts more on some days than the BART sources. Utah's 2015 SIP was submitted with the goal of demonstrating greater reasonable progress than the CAA NO_x BART requirement, not demonstrating overall reasonable progress for BART and non-BART sources. Furthermore, the State has a burden to show that the Alternative is better than BART, and it cannot shift its burden to meet the BART requirement by suggesting that non-BART sources contribute more to visibility impairment on certain days than the BART sources. Moreover, we disagree with the State's apparent suggestion to ignore the 98th percentile modeling results because if emissions from the non-BART sources had been included in the modeling analyses, the differences between the Alternative and the Benchmark would not be perceptible to visitors to the Class I areas. The State's assertions regarding perceptibility are misplaced because "[f]ailing to consider

[181] 70 FR 39104, 39121.

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." Therefore, contrary to the State's assertion, the State cannot use impacts from non-BART sources to eliminate/discount the results from the metric to assess whether its proposed BART Alternative provides for greater reasonable progress than implementation of the CAA's BART requirement.

The remaining portions of these comments, including those about the weight we assigned to the 98th percentile, are addressed elsewhere in the FRN and in this document.

Comment: [Conserv Orgs – Gray Report, p. 2] Despite the fact that the comparison of estimated 98th percentile visibility impacts at the affected Class I areas did not support the approval of Utah's BART Alternative plan, this key metric was not given sufficient weight in the overall assessment, in favor of less-influential metrics that do not accurately represent peak level visibility impacts within the Class I areas. A reasonable consideration of this visibility metric would lead to disapproval of Utah's Alternative plan.

Response: We agree with the commenter's assessment.

Comment: [Conserv Orgs – Gray Report, p. 12] Examination of typical transport patterns for emissions from the three facilities, in addition to comparisons of model results for the three individual facilities, shows that emission from the Carbon facility have a somewhat greater impact (per lb of emissions) at Arches National Park ("NP") and at Flat Tops Wilderness than emissions from the Hunter and Huntington facilities.

Response: We agree with that emissions from the Carbon facility have a somewhat greater impact (per lb of emissions) at Arches National Park and at Flat Tops Wilderness than emissions from the Hunter and Huntington facilities.

Comment: [Conserv Orgs – Gray Report, p. 13] As described above, the spreading out of emissions for the BART Benchmark scenario relative to the BART Alternative scenario results in fewer lower-level impacts which is why the number of days in which delta dv exceeds 0.5 is lower for the BART Alternative scenario. Examination of the modeled visibility impacts at the three most impacted Class I areas (Arches NP, Canyonlands NP and Capitol Reef NP) reveals that for Canyonlands NP and Capitol Reef NP, the peak modeled impacts (see Table 5, for example) are significantly lower for the BART Benchmark plan than for the BART Alternative despite the fact that the number of delta dv exceedances of 0.5 dv is slightly lower for the BART Alternative scenario. Emissions from the Carbon facility in the BART Benchmark scenario have a larger effect on visibility at Arches NP (and also Flat Tops, which is somewhat closer to Carbon than the other two facilities). For this reason, both the peak modeled impact and number of exceedance days are higher under the BART Benchmark scenario at these two Class I area[s].

Table 5. Three-Year Average Modeled 98th Percentile Delta dv

	Alternative	BART Benchmark	BART Benchmark vs. Alternative*
Arches National Park	4.36	4.57	-0.21
Black Canyon of the Gunnison National Park	1.09	1.03	0.06
Bryce Canyon National Park	1.22	1.18	0.04
Canyonlands National Park	5.89	5.10	0.78
Capitol Reef National Park	4.17	3.58	0.59
Flat Tops Wilderness	1.28	1.43	-0.15
Grand Canyon National Park	1.38	1.32	0.06
Mesa Verde National Park	1.35	1.23	0.12
Zion National Park	0.82	0.80	0.02
Average (All 9 Class I Areas)	**2.39**	**2.25**	**0.14**

* Positive values favor BART Benchmark (lower modeled visibility impact); negative values favor Alternative

Response: We acknowledge the commenter's assessment of Utah's modeling results and consider the assessment to be reasonable though we note the data are slightly different from that presented in Utah's Staff Report, Average 98th Percentile (22nd High) Across 3 Years, Table 11. It is unclear how the data in Table 5 were derived, but the commenter's conclusions would be the same using the data from the Staff Report.

Comment: **[PacifiCorp, p. 16]** In fact, EPA has determined in other states that visibility improvements even greater than 0.14 are too small or inconsequential to justify additional pollution controls in the BART context. (See 77 FR 24794 (0.27 dV improvement termed "small" and did not justify additional pollution controls in New York); 77 FR 11879, 11891 (0.043 to 0.16 dV improvements considered "very small additional visibility improvements" that did not justify NO_x controls in Mississippi); 77 FR18052, 18066 (agreeing with Colorado's determination that "low visibility improvement (under 0.2 dV)" did not justify SCR for Comanche units)). Tellingly, the "low visibility improvements" that Colorado found at the Comanche units not to justify post-combustion NO_x controls – as agreed to by EPA -- were 0.17 and 0.14 dV. 77 FR at 18066. In evaluating the BART Alternative here, EPA should not rely on this tiny modeled dv improvement to support the conclusion that "this metric favors the BART Benchmark" (81 FR at 2030) when it really does no such thing for the reasons noted above.

Response: We disagree with the commenters' assertion that EPA should disregard the modeled deciview improvement difference of 0.14 dv between the BART Alternative and the BART Benchmark because other EPA actions considered similar visibility improvements (ranging from 0.043 – 0.17 dV) in New York, Mississippi, and Colorado to be "small" and determined that these benefits did not justify additional controls. First, when reporting modeling results comparing the two scenarios – the BART Alternative and the BART Benchmark - the Utah SIP described average results over three years and nine Class I areas. We fully anticipate lower magnitude visibility improvements in this case because the 98th percentile metric is based impacts at nine Class I areas, which is different from the methodology for the single-source BART results, which are based on the highest impacted for the one source at only one Class I area.

Furthermore, the specific examples provided by the commenter are all instances where the visibility impact of controls and considered alongside other factors, including cost of controls, as part of case-by-case BART determinations to determine the "best" level of control. Utah's BART Alternative analysis is notably different than these BART determinations because the relevant consideration here is the difference in visibility impacts between the BART Benchmark and Alternative, rather than whether the visibility impacts justify the costs and other impacts of controls. Thus, even if we determined the 0.14 dv between the BART Alternative and the BART Benchmark to be inconsequential, which we have not, the fact that Alternative does not achieve greater visibility improvement would still result in failing the "better than BART" test.

Comment: [PacifiCorp, p. 13] As explained in the Hoffnagle Report (and in greater detail below), the 98th Percentile metric measures only the 8th highest impact day, and even then, it greatly overestimates the modeled visibility improvement. For example, when correcting for the margin of error rates inherent in the model, EPA's presumed visibility improvement resulting from the BART Benchmark becomes virtually non-existent. This information makes clear that EPA should take into account the inherent weakness of this metric (due to the margin of error rates and other reasons explained in the Hoffnagle Report) in regard to the BART Alternative. In this light, EPA should give little to no weight to this metric in evaluating the BART Alternative. This is particularly true because the BART Guidelines make use of the 98th Percentile Impact metric permissive even in the context of evaluating BART: "[T]he following is an approach that you may use to determine visibility impacts...," which includes comparing "the 98th percent days for the pre- and post-control runs." See BART Guidelines at Section IV.D.5 (emphasis added). As a discretionary tool, the result of this metric alone should not determine the outcome of EPA's decision regarding the BART Alternative.

In addition, EPA's conclusion in applying the 98th Percentile Impact analysis is that, "on the whole… the BART Benchmark is better on average across all years and all Class I areas (0.14 dv difference)." 81 FR at 2030. By any candid measure, however, such a small difference is not only too miniscule to be of any value, but falls well within the margin of error of the complex modeling calculations used to reach this conclusion as explained in the Hoffnagle Report.

Response: We disagree that visibility improvements associated with the BART Benchmark are "virtually nonexistent" and provide a response to whether visibility improvements below 1.0 deciview should be considered as well as to the commenter's concern regarding the margin of error associated with the 98th percentile metric elsewhere in this document.

Comment: [PacifiCorp, p. 4] In addition, the single metric EPA asserts shows better visibility improvement under the FIP Proposal (98th Percentile metric) should be afforded little or no weight in evaluating the SIP Proposal.

Response: The response to this comment is provided in the FRN and elsewhere in this RTC document.

Comment: [Conserv Orgs, p. 33] In rendering a decision on its co-proposal, EPA must place a heavy reliance on consistent application of the 98th percentile metric, which demonstrates the superiority of BART.

Response: We agree as discussed in the FRN and elsewhere in this RTC document.

Comment: [Conserv Orgs, p. 34] As such, Utah has failed to meet its heavy burden of proving by the clear weight-of-evidence that its BART Alternative results in greater visibility improvement than would BART when judged by a consistent application of the 98th percentile metric.

Response: This comment is a characterization of the CAA and regulatory requirements, and we have addressed the specific concerns about the State's SIP elsewhere.

Comment: [Conserv Orgs, p. 35] EPA's Four Corners 98th percentile analysis showed that the BART alternative provided greater delta deciview improvement at each and every 16 Class I area when compared to EPA's BART determination. This contrasts with the Utah BART Alternative that failed to establish visibility improvement at a majority of affected Class I areas.

Response: We note that the commenter's comparison is not directly applicable to our action on Utah's regional haze plan because the Four Corners Power Plant action involved the application of a Tribal Authority Rule (TAR) which allows for broader flexibility than a SIP or FIP. We acknowledge in the Four Corners action that the BART alternative was better than BART at all of the 16 Class I areas.

Comment: [Conserv Orgs, p. 35] EPA's also heavily relied on a similar 98th percentile analysis for the Tesoro BART alternative. It again used consistent meteorological years (in that case, 2003-2005). EPA's does not explicitly calculate the average across all Class I areas in the Tesoro analysis; however, the average clearly favors the Tesoro BART alternative because the Tesoro BART alternative resulted in greater visibility improvement at each and every affected Class I area. The Tesoro modeling results stand in stark contrast to EPA's Utah results, where EPA's 98th percentile analysis for Utah shows that the BART Alternative only achieves greater visibility benefits in 2 of 9 affected Class I areas.

Response: Comment is noted and we agree that Utah's use of the 98th percentile results was inconsistent with EPA's final determine for the Tesoro BART Alternative.

Comment: [Conserv Orgs, p. 36] The Tesoro methodology was nearly replicated in EPA's Idaho Amalgamated Sugar analysis. Again, EPA relied on consistent meteorological years (2003-2005). Though it did not explicitly average across all Class I areas, EPA did implicitly consider this information in noting the cumulative or "overall greater progress towards achieving natural conditions under the BART Alternative." EPA's 98th percentile modeling results in Idaho also stands in stark contrast to Utah because the Amalgamated Sugar BART alternative resulted in visibility improvement at 6 of 7 affected Class I areas.

Response: Comment is noted and we agree that Utah's use of the 98th percentile results was inconsistent with EPA's final determination for the Idaho Amalgamated Sugar BART Alternative.

Comment: [NPS Tech, pp. 36-37] Despite EPA's finding that "the 98th percentile visibility impact is a 'key metric' that EPA has primarily focused on in prior actions" it "proposes to conclude that by itself it is not a dispositive metric in weighing a BART Alternative." However, the most appropriate comparative statistical metrics consistently used by EPA are the 98th percentile values presented in UDAQ Tables 8 & 9, both of which show that the cumulative impact of UDAQ's BART Alternative does not make more reasonable progress than the BART NO_x scenario. Furthermore, Table 8 shows that UDAQ's BART Alternative fails this test at seven of nine Class I areas, while Table 9 shows failure at five of nine Class I areas.

Response: We agree with the commenter that of the evidence presented, the 98th percentile metric is most appropriate comparative statistical metric, which has been consistently used by EPA. Responses to the remaining portions of this comment are provided in the FRN and elsewhere in this RTC document.

Comment: [NPS Tech, p. 37] In a clear weight-of-evidence demonstration, the burden is on UDAQ to show unequivocally that it has met that test—it has not done so because it has failed to show that the "key metric" favors its position, even when inflated emissions from Hunter Unit 3 and Carbon are included in the hypothetical BART scenario. EPA should not marginalize its most consistently applied and most valuable decision metric in favor of metrics that are either invalid, rejected, never before used, or of minor importance. The only two metrics that EPA has consistently used in other actions—the 98th percentile and the number of days with greater than 0.5 dv impact—yield a "split decision" even if given equal weight (which they should not). A "split decision" does not demonstrate a "clear weight-of-evidence." Thus the UDAQ BART Alternative does not meet current regulatory "clear weight-of-evidence" requirements, and EPA should reject this alternative in favor of BART.

Response: We agree that it is important to assess the strengths and weaknesses of the evidence from the metrics, and that where the metrics yield a "split decision" the State has not demonstrated that the Alternative is "clearly" better than the BART Benchmark. The response to the rest of these this comments is provided in the FRN and elsewhere in this document.

Comment: [Conserv Orgs, p. 2] Even taking Utah's emissions assumptions and visibility modeling at face value, application of the consistently applied and widely accepted 98th percentile visibility metric shows that operation of selective catalytic reduction at the four BART units achieves greater visibility improvement than does Utah's proposed BART Alternative, and no other factor favors EPA's selection of Utah's BART Alternative over BART.

Response: We agree that evaluation of the 98th percentile metric shows that the BART Alternative is not better than the BART Benchmark. The response to this comment is provided in the FRN.

Comment: The Utah DAQ CALPUFF model results are shown in Table 4. These are truly negligible improvements in modeled visibility and a better test than the 98% test which is for so few (and mostly winter) days. Moreover, given the margins of error inherent in the CALPUFF modeling, these alleged improvements all fall within the margin of error. Utah's reliance on

monitored data and other factors in its analysis of the Utah BART Alternative is a sound practice where the CALPUFF modeled visibility improvements are within the margins of error.

Table 4: Utah DAQ 90% Improvement Analysis

110th highest deciviews over 3 years				
	Base case	Alternative	SCR	SCR minus Alternative
Capitol Reef	2.416	1.234	1.15	-0.084
Arches	3.721	1.859	1.999	0.14
Canyonlands	4.183	2.447	2.148	-0.299

Response: It is not clear whether the commenter's characterization of modeled visibility improvements as "truly negligible" is in reference to the absolute improvement from BART and BART Alternative scenarios or to the relative difference between these two scenarios. If the commenter is referring to the absolute improvements, we do not agree that these improvements are negligible. On the contrary, Utah's 90th percentile CALPUFF model results (Table 4, as presented by the commenter) indicate that both the Benchmark and Alternative would result in significant improvements in visibility at multiple Class I areas despite the fact, noted elsewhere in this RTC document, that the 90th percentile dilutes the potential visibility benefits associated with controls.

If the commenter is referring to the relative difference between the two scenarios, we agree that the difference in visibility improvement is small between the two cases. Indeed, as explained in our proposal, because the difference between the two scenarios under the 90th percentile metric is very small (0.006 dv on average across all affected areas), this metric "only marginally supports a conclusion that the BART Alternative achieves greater reasonable progress."[182] Furthermore, the 98th percentile metric does not show that the Alternative is better and even the annual average metric does not show that the Alternative is better at all affected Class I areas. Accordingly, as explained more fully elsewhere in this document, the State has not met its burden to show that the Alternative will achieve "greater reasonable progress" than BART. The commenter also implies that modeled visibility differences are negligible because they fall within the "margin of error" of CALPUFF. We disagree. While there is some uncertainty in the absolute visibility impacts and benefits, CALPUFF provides a reliable assessment of the relative degree of improvement expected from two different control scenarios. In this case, that assessment shows that, for the 90th percentile metric, there is very little difference between the BART Benchmark and BART Alternative. Finally, although we do not agree with the commenter's calculation of the "margin of error" and criticism of the use of CALPUFF, we note that the State was not required to use CALPUFF for purposes of its BART Alternative Demonstration. Utah or PacifiCorp could have used other models with more advanced chemistry and dispersion techniques to support the BART Alternative demonstration, but chose not to do so. Please refer to our responses to the commenter's additional assertions about the "margin of error" of CALPUFF and the State's reliance on monitored data and other factors elsewhere in this document and the FRN.

[182] 81 FR 2004, 2023 (Jan. 14, 2016).

Comment: Apply the Transport and Diffusion Margin of Error: For the Utah DAQ CALPUFF model results, Table 5 shows the effect of considering the transport/diffusion margin of error. The reductions in predicted deciviews account only for the margin of error bias in the transport and diffusion of gases to the Parks and do not account for the errors in atmospheric chemistry.

Table 5. Three-Year Average Modeled 98th Percentile Delta dv

	Alternative	BART Benchmark	BART Benchmark vs. Alternative*
Arches National Park	4.36	4.57	-0.21
Black Canyon of the Gunnison National Park	1.09	1.03	0.06
Bryce Canyon National Park	1.22	1.18	0.04
Canyonlands National Park	5.89	5.10	0.78
Capitol Reef National Park	4.17	3.58	0.59
Flat Tops Wilderness	1.28	1.43	-0.15
Grand Canyon National Park	1.38	1.32	0.06
Mesa Verde National Park	1.35	1.23	0.12
Zion National Park	0.82	0.80	0.02
Average (All 9 Class I Areas)	**2.39**	**2.25**	**0.14**

* Positive values favor BART Benchmark (lower modeled visibility impact); negative values favor Alternative

[1] "SCR" in the tables in this Report actually refer to EPA's required SCR/LNB/OFA NO_x BART controls. The visibility improvement and impacts reflected in these tables reflect the improvements and impacts from SCR/LNB/OFA, and not just SCR.

The Table 5 results show that utilizing the transport and diffusion margin of error, the Utah DAQ CALPUFF model results show that only marginal improvement in visibility on the worst case 8 days per year (98% test) at Capitol Reef and Canyonlands National Parks for all four BART units if SCR/LNB/OFA were installed. These improvements in visibility would not be perceptible to the visitor and are likely to occur in the winter months when the problems with EPA's background ammonia would be particularly acute. At Arches National Park, the visibility will be marginally degraded by the installation of SCR/LNB/OFA's over the BART Alternative proposed by the Utah DAQ based on this information.

Response: As explained elsewhere in this document, we do not agree with the commenter's calculation of a transport and diffusion "margin of error" based on the ENVIRON Report. Accordingly, we also disagree with the commenter's implied assertion this supposed "margin of error" should be applied to the CALPUFF model results in the Utah SIP. While there is some uncertainty in the absolute visibility impacts and benefits, the relative level of impact is a reliable assessment of the degree of visibility impacts and benefit from controls. Any uncertainties in meteorological conditions that govern the transport and diffusion of pollutants are less important in comparing impacts between the BART Benchmark and the BART Alternative, since the same effects will be included in both scenario model simulations. Furthermore, to the extent there is uncertainty in the comparison between these two scenarios, such uncertainty weighs against a finding that the Alternative clearly achieves greater visibility benefits than BART and thus supports our final determination that the State has not demonstrated, based on the clear weight-of-evidence that the Alternative would achieves greater reasonable progress than BART.

iv. Annual Average Impact (dv)

Comment: [UDAQ, p. 13] Utah's annual average impact metric demonstrated that there is a 0.009 dv greater improvement under BART Alternative than under BART across all Class I areas. See TSD, Ch. 1, p. 23, Table 9. On the area-by-area basis, six out of nine areas demonstrated better or the same result under the BART Alternative. See id. Whereas Utah recognizes that the difference is fairly small, this metric represents a projected improvement over a longer period of time than the 98th percentile impact, which focuses on a particular day. The value of this metric and the calculated result is that the improvement is shown consistently over a span of a year. The improvement is also demonstrated in more than half of Class I areas. EPA should find that this metric is supportive of the BART Alternative and refrain from finding it entirely non-supportive, as suggested in the co-proposal to reject BART Alternative. See 81 Fed. Reg. at 2030.

Response: This response to this comment is included in the FRN.

Comment: [PacifiCorp, p. 18] *Annual Average Impact (dv)* EPA properly concluded that it should consider the Annual Average Impact metric because it "provides additional useful information." See 81 FR at 2023. EPA also properly focuses on this metric because it provides "an indication of the modeled visibility impacts for the entire year" as compared to the 98th Percentile Impact analysis which focuses on a single day. Id. In other words it provides a wide-angle view of visibility improvement over a long period of time instead of the compressed telephoto perspective of looking at a single day. This is important when considering the BART Alternative under the weight-of-evidence analysis which allows a state, as explained above, to consider the relative strengths and weaknesses of information and data. Although EPA acknowledges the dv impact resulting from "this metric is small (0.009 dv)," EPA still properly proposes to find – because of the more expansive nature of this metric - that it at least marginally "supports a conclusion that the BART Alternative achieves greater reasonable progress." Id.

In evaluating the FIP Proposal, however, EPA flips all of this rationale on its head and instead proposes to conclude that this metric "does not support a conclusion that the BART Alternative achieves greater reasonable progress than the BART Benchmark." 81 FR at 3030. To support this opposite conclusion, EPA tries to force this wide-angle view into a more compressed form and essentially argues that the metric provides weak data and information because: (i) "this metric shows less or equal visibility improvement at four of the nine Class I areas;" and (ii) "it does not represent the benefits of the BART Alternative on the maximum impact days." Id. The weight-of-evidence test, however, does not allow for such trickery by EPA. EPA cannot change the focus of the metric under its FIP Proposal. In evaluating this metric at face value (without demanding that it be more or different than it is), EPA should stick with its conclusion that it provides some support under the weight-of-evidence analysis for approving the BART Alternative.

Response: The response to this comment is included in the FRN.

Comment: [Conserv Orgs – Gray Report, p. 8] The annual average of the modeled daily visibility impacts represents a "central" statistic and is only marginally useful in describing peak

impacts (to the extent that the collection of peak impacts will have an effect on the overall average). The annual average includes numerous days in which the modeled impacts were very small or negligible. Therefore the modeled "annual average" delta dv should be given little weight.

Response: We agree with the assessment of the annual average visibility impacts in this comment.

Comment: **[NPS Tech, pp. 25-26] Annual Average Impact (dv)** In its evaluation of BART and a BART Alternative at the Four Corners Power Plant, EPA rejected a proposal by APS, the plant owner, to average the visibility improvement over 16 Class I areas.[183] For the Navajo Generating Station, EPA rejected a proposal from SRP, the plant operator, which "demonstrated visibility improvements across the 11 parks … with an average of about 0.10 deciviews."[184] Despite having rejected similar averaging proposals on the Navajo Nation (as discussed above), EPA is now willing to consider this approach in Utah:

Utah's modeling shows that the average annual dv impact at all Class I areas is better under the Utah BART Alternative at five of the nine Class I areas, and is better on average across all the Class I areas. The average impact was calculated by averaging all daily modeling results for each year and then calculating a 3-year average from the annual average. Utah's information shows that the BART Alternative is better than the BART Benchmark by 0.009 dv on average across all nine Class I areas. While EPA has not considered this metric in the past, since the State includes it, we consider it here. Furthermore, the BART Guidelines state that, "in determining what, if any, emission controls should be required, the State will have the opportunity to consider the frequency, duration, and intensity of a source's predicted effect on visibility." The annual average does provide an indication of the modeled visibility impacts for the entire year while the 98th percentile modeled results speak to a particular day (the 8th highest impacted day). Accordingly, and while we have typically relied primarily on the 98th percentile impacts in evaluating BART controls in other actions, we propose to find that the annual average impact provides additional useful information in considering Utah's weight-of-evidence. However, given that the difference in this metric is small (0.009 dv), we propose to find that it only marginally supports a conclusion that the BART Alternative achieves greater reasonable progress.[185]

We disagree with EPA's statement that this approach, which EPA rejected elsewhere and is contrary to EPA's stated intent to be *"consistent with our actions elsewhere"* in previous regional haze rulemakings, now provides "useful information."
UDAQ's Table 6 shows the results of using an average delta-dv across all Class I areas. Under this approach, for example, the 4.1 dv (98th percentile) impact at Capitol Reef NP becomes a 0.4 dv impact averaged across Capitol Reef NP. In effect, UDAQ has artificially diluted an impact that would be clearly perceptible to an impact that is considered imperceptible.
UDAQ's approach has been consistently rejected by EPA because it does not capture the magnitude of the impacts, but, instead, simply dilutes an impact by spatially and temporally

[183] EPA-R09-OAR-2008-0454-0013.3 (FN 47 in NPS document).
[184] EPA-R09-OAR-2008-0454-0014 revised SRP BART analysis Jan 09 (FN 48 in NPS document).
[185] 40 CFR Part 52 [EPA–R08–OAR–2015–0463; FRL—9939–43–Region 8]; 81 FR 2004, 2030 (Jan. 14, 2016).

spreading it across the Class I area. Instead of supporting this averaging metric and thus implying that is has some validity in Utah, EPA should clearly reject it.

Response: We partially agree and partially disagree with this comment. As the commenter points out, EPA has rejected the use of averaging across multiple areas in lieu of consideration of visibility benefits at individual areas for BART determinations, *see, e.g.*, 77 FR 72512, 72519. However, we have allowed for and used such spatial averaging for BART alternative demonstrations under both 41 CFR 51.308(e)(3), which expressly provides for such averaging, and under 308(e)(2)(i)(E). *See, e.g.*, 79 FR 56322, 56328. We thus disagree it is inconsistent with EPA's past practice to average visibility impacts across multiple Class I areas in the context of a better-than-BART analysis.

However, we agree with the commenter that the *temporal* averaging under the annual average metric dilutes the visibility benefits associated with controls and is inconsistent with the BART Guidelines and the CALPUFF modeling approach used by the State. As discussed in the FRN, based on this and other considerations, we find that the annual average impact metric only marginally supports Utah's BART Alternative.

Comment: [UARG, p. 6] EPA's discussion of Utah's consideration of annual average dv impacts and 90th percentile dv impacts is, however, flawed. EPA notes that the Agency has not itself previously considered or relied on these metrics to evaluate BART or BART alternatives. Nevertheless, EPA properly acknowledges that "the BART Guidelines allow states to consider other visibility metrics" than those that the Guidelines specifically identify, and EPA acknowledges that both of these metrics provide information that is useful in evaluating the frequency, duration, and intensity of a source's predicted effects on visibility, as the Guidelines contemplate. EPA asserts, however, that these metrics "only marginally support[ ] a conclusion that the BART Alternative achieves greater reasonable progress" than BART would achieve because of the small size of the modeled overall difference in average dv improvements (across all years and Class I areas) between the BART Benchmark and the BART Alternative. EPA's evaluation, however, ignores that these metrics show that the BART Alternative is better than the BART Benchmark at, respectively, five and seven of the nine relevant Class I areas, and it fails to give proper consideration to the totality of the evidence the state developed. EPA also fails to recognize properly that the state has broad discretion in determining how to weigh the evidence before it. Elsewhere in the Proposed Rule, EPA appears to acknowledge that state authority is constrained only by the requirements that the state's discretion be "reasonably exercised" and "supported by adequate documentation." *Id.* at 2006 (quoting EPA's 2006 BART Alternative rules). EPA should defer to Utah's determinations.

Response: The response to this comment is provided in the FRN.

Comment: [UARG, p. 18] EPA similarly discounts the annual average dv impacts metric because EPA views the difference in impacts measured by this metric as relatively small and because the metric does not measure the benefits of the BART Alternative on the "maximum impact days." *Id.* at 2030.

Response: The response to this comment is provided in the FRN.

v. 90th Percentile Impact (dv)

Comment: [UDAQ, pp. 13-14] EPA underestimates the value of the 90th percentile metric and assigns little weight to it, explaining that "the use of the 90th percentile impacts to evaluate alternatives has not been EPA's practice for source-specific BART determinations. . . ." *Id.* However, the BART Guidelines do allow the states to consider other visibility metrics in addition to the 98th percentile and this metric deserves a closer look by EPA. This is especially true in light of Utah's results under this metric in the area- by-area comparisons, demonstrating improvement in almost 80% of the Class I areas. The 90th percentile measures impacts on the 110th highest day in three years (or the worst 10% days) and comes closest to evaluating targeted days under the BART rule, which requires improvement in visibility during the 20% worst days. See 40 C.F.R. 51.308(e)(3). EPA should not dismiss this metric simply because it has not been its regular practice to use it, and instead should be guided by whether use of the 90th percentile impact results in reasonable progress, and whether Utah reasonably exercised its discretion in relying on it as contributing to the weight of the evidence in favor of the BART Alternative.

Response: The response to this comment is provided in the FRN.

Comment: [Conserv Orgs – Gray Report, p. 10] If the objective is to use a metric that is representative of the peak impacts, then the 90th percentile metric should be given lower weight than the 98th percentile impact metric (but somewhat more than the exceedance data metrics). *(This comment is further supported by discussion in comments located under section XX, Comments on Technical Interpretations of CALPUFF Results.)*

Response: We agree with this comment and discuss our evaluation of the 90th percentile metric in the FRN.

Comment: [Conserv Orgs – Gray Report, p. 19] Using the 90th percentile metric, the average difference across the parks is only 0.007 dv, which is too small to conclude that Utah's BART Alternative plan is "better than BART."

Response: Utah's Staff Review document states that the average difference between the BART Benchmark and Alternative under the 90th percentile metric is 0.006 dv.[186] For the reasons explained in the FRN, we find this metric only marginally supports the Alternative.

Comment: [PacifiCorp, p. 18] *90th Percentile Impact (dv)* – As with the Annual Average Impact metric, EPA properly concluded to consider the 90th Percentile Impact metric which "shows that the BART Alternative is better at seven of the nine Class I areas and is slightly better averaged across three years and across nine Class I areas (0.006 dv difference)." EPA uses this metric even though "the use of the 90th percentile impacts to evaluate alternatives has not been EPA's practice for source-specific BART determinations…." See 81 FR at 2023. Because of the expansive weight-of-evidence test which considers "all available information and data" as described above, EPA is correct to take this metric into account and conclude that it somewhat

[186] UDAQ Staff Review at 24.

"supports a conclusion that the BART Alternative achieves greater reasonable progress." Id. Use of the 90th Percentile metric actually provides a more useful look at modeled visibility improvement because it evaluates the 10% worst impacted day as opposed to the 2% worst impacted day under the 98th Percentile metric. Because the BART rule partially targets improving visibility during the 20% worst days, of all the metrics used by Utah and EPA to evaluate the BART Alternative the 90th Percentile metric comes closest to evaluating those targeted days. That alone suggests that this metric should be afforded some weight in evaluating the BART Alternative as EPA has proposed. EPA takes the opposite approach, however, when it comes to the FIP Proposal. There, EPA baldly concludes only that the use of this metric is "questionable" support for the BART Alternative. Id. at 2030. Simply slapping the label "questionable" on this metric without further support does not make it so, nor does it make this metric unavailable to support EPA's analysis under the SIP proposal that it "supports a conclusion that the BART Alternative achieves greater reasonable progress." Id. at 2023. This is particularly true in light of the Hoffnagle Report's comments regarding the 90th Percentile metric.

Response: We partially agree and partially disagree with this comment. We agree that it is appropriate to consider the 90th percentile modeling results in evaluating the State's weight-of-evidence analysis because this metric provides some additional information about visibility benefits. However, we disagree that the 90th percentile metric is more useful than the 98th percentile. As explained in the FRN and elsewhere in this RTC document, the 98th percentile day is a key metric for evaluating the benefits of controls because it takes into account peak visibility impacts. In contrast, the 90th percentile metric ignores more than a month's worth of visibility data and thus obscures the impacts of controls and dilutes predicted visibility improvements. The NPS provided a helpful example to illustrate the result of considering the 90th percentile versus the 98th percentile CALPUFF, based on comparative modeling results for one of the National Parks. For the Mesa Verde National Park, the CALPUFF model predicted the following results: 1.3 dv impact for the 98th percentile, and 0.4 dv impact for the 90th percentile. This example is helpful because it shows that use of the 90th percentile converts an impact to approximately one third of what the 98th percentile modeling results show, and therefore significantly dilutes predictions.

The State provided in comments that the 90th percentile day comes closest to evaluating visibility impacts on the 20% worst days. However, as we explain in the FRN, we disagree that these two metrics provide similar information. The 90th percentile relates to a single value, the 110th highest impact day across three years for the scenario analyzed, while the 20% worst days describes visibility impacts from all sources on the average of the 20% worst visibility days. The State has not provided any further justification for relying on the 90th percentile metric, other than it is an additional data point to consider. Thus, for the reasons articulated here and in the FRN, we find that 90th percentile metric only marginally supports the BART Alternative.

Comment: In rejecting Utah's BART Alternative, EPA discussed 9 factors considered as part of the weight-of-evidence test. However, EPA primarily relies on just one, the 98% of potential visibility impacts in the Parks. That means the deciview impacts are based on just a single day – the 8th highest impact day. This, of course is the most stringent test and is not derived from the focus of the BART rule on the best 20% of days and the worst 20% of days. The more useful

test, I believe, is the evaluation of the 90% results (worst 10% of days at the Park). EPA does not present this modeling test.

Response: The response to this comment is provided in the FRN and elsewhere in this RTC document.

Comment: [NPS Tech, pp. 26-27] 90th Percentile Impact (dv)

UDAQ's Table 7 presents 90th percentile values which have never before been allowed by EPA and were explicitly rejected by EPA in North Dakota as "not rational"[50] and also explicitly rejected in the BART Guidelines:

> The use of 90th percentile value would effectively allow visibility effects that are predicted to occur at the level of the threshold (or higher) on 36 or 37 days a year. We do not believe that such an approach would be consistent with the language of the statute.[187]

For example, this approach converts a perceptible 1.3 dv (98th percentile) impact at Mesa Verde NP to an imperceptible 0.4 dv impact.

Now, EPA "propose[s] to find that it [90th percentile] only marginally supports a conclusion that the BART Alternative achieves greater reasonable progress." Such a proposal is inconsistent with the BART Guidelines and all previous EPA BART actions and should not be given any weight.

In conclusion, we recommend that EPA rely on the 98th percentile "key metric" as consistent with previous decisions. The other metrics do not provide clear weight-of-evidence that the BART Alternative provides greater reasonable progress than the BART scenario. The BART Alternative is not better than BART.

Response: The response to this comment is provided in the FRN. We note that our statements in the North Dakota notice of final rulemaking[188] and BART Guidelines refer to use of the 90th percentile value in the context of determining whether a source is subject to BART.

Comment: [UARG, p. 19] EPA also discounts the 90th percentile impacts analysis "because of the small difference between the two scenarios." *Id.*

Response: The response to this comment is provided in the FRN.

vi. Timing for the Emissions Reductions

Comment: [PacifiCorp, pp. 2, 19, 26] EPA unfairly minimizes the timing of emissions reductions. EPA glosses over the benefits of the timing of the BART Alternative emissions reductions. The emissions reductions associated with the BART Alternative began in 2007 and

[187] 40 CFR Part 51 [FRL–7925–9] RIN 2060–AJ31; 70 FR 39171, 39121 (July 6, 2005).
[188] 77 FR 20894, 20910 (Apr. 6, 2012).

have continued to this day, long before any emissions reductions would occur under the FIP Proposal.

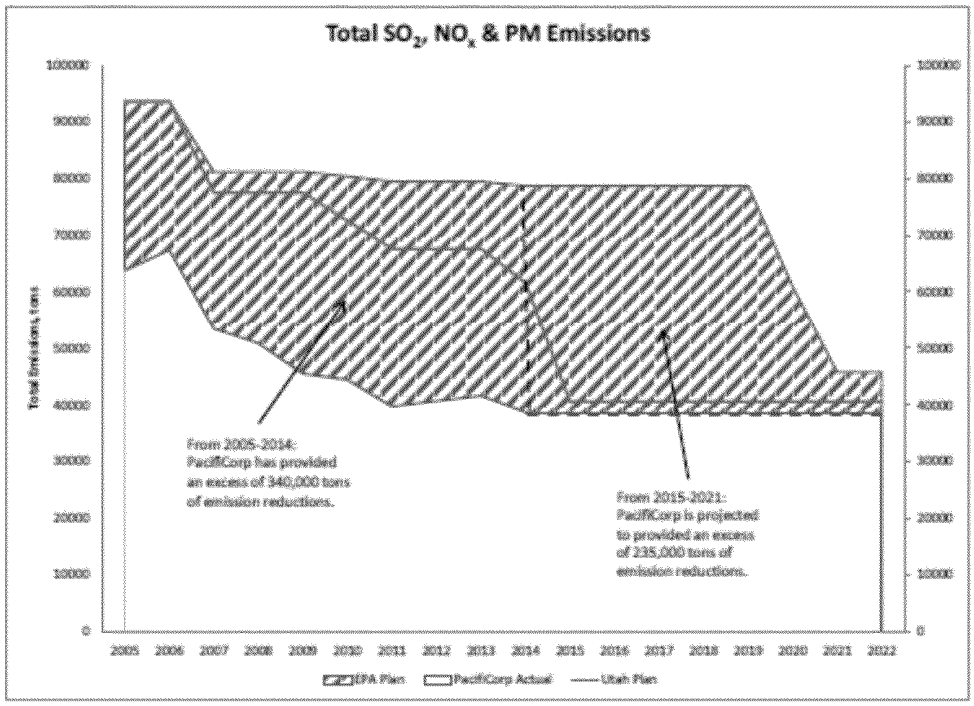
Further, by attempting to impose BART controls EPA is actually requiring both the BART Alternative and BART – reaching well beyond the scope of its authority.

Timing for the Emissions Reductions – In considering the Timing of Emissions Reductions metric, EPA notes simply that "the reductions from the BART Alternative will occur before the BART Benchmark." See 81 FR at 2023. Although this is a true statement on its face, EPA does an extreme disservice to Utah, PacifiCorp, its customers and the general public by including such an underwhelming description of the meaningful and large visibility benefits associated with the timing of emissions reductions under the BART Alternative[189] as compared to the BART Benchmark. In approving the BART Alternative, PacifiCorp strongly encourages EPA to more completely describe both the tremendous scope, and the overwhelmingly positive visibility impact, of the timing of emission reductions under the BART Alternative as compared to the BART Benchmark.

The table below shows the timing of controls installed under the BART Alternative, along with: (i) the total tons of emissions reductions achieved since the date of the installation of the controls; and (ii) the projected emissions reductions to be achieved until the time when the BART Benchmark is expected to be implemented.[190]

[189] In at least three other portions of the Proposed Action, EPA at least acknowledges that the "reductions under the Utah BART Alternative are required under the State SIP by August 2015, as noted in Table 5, providing an **early and on-going visibility benefit as compared to BART**." (emphasis added) See 81 FR 2004, 2018, 2024, and 2030. In addition, EPA states in the Proposed Action that: "Also notable is that combustion control upgrades at the Hunter and Huntington facilities have been achieving significant NO_x reductions **since the time of their installation between 2006 and 2014**." (emphasis added) Id. at 2030. At the critical point of describing in the Proposed Action the timing of reductions as evidence to consider under the Weight-of-evidence analysis, however, EPA could not even be bothered to do more than nominally and incompletely describe that evidence, leaving out the importance, scope and impact of the timing of such significant emissions reductions. This, in turn, led to EPA incompletely evaluating the weight of this evidence when considering the SIP Proposal (even though EPA actually reaches the proper conclusion in proposing to approve the BART Alternative).

[190] EPA projects that the BART Benchmark "likely would be fully implemented sometime between 2019 and 2021." See 81 FR 2004, 2030.



As can be seen, the BART Alternative already has produced a total of 340,000 tons of combined emission reductions beginning in 2007 and continuing through 2014. And these emissions reductions have occurred at a time long before the BART Benchmark ever would be implemented. In addition, the BART Alternative is expected to continue to produce significant emission reductions between now and the time of the BART Benchmark (and beyond). EPA should specifically note the significant visibility benefits associated with the timing of these emissions reductions and assign them great weight under the Weight-of-evidence test.[191] What EPA should not do, however, is brush over the Emission Reduction Timing metric by failing to adequately describe or consider the significant timing benefits as EPA appears to have done in its tepid conclusions regarding the weight of the Emission Reduction Timing metric in evaluating the BART Benchmark.

Even in evaluating its FIP Proposal, EPA cannot escape acknowledging the benefits of the timing of emission reductions achieved under the BART Alternative as compared to the BART Benchmark. Indeed, EPA does not, and cannot, offer any criticism to the contrary and instead concludes that: "we recognize that the reductions from the BART Alternative would occur before the BART Alternative." See 81 FR at 2030. Therefore, even though EPA has employed every tactic it can think of criticize other metrics used to evaluate the BART Alternative under its FIP Proposal, EPA makes no such attempt when it comes to the timing metric. This failure is additional evidence that the timing metric should carry great weight in EPA's weight-of-evidence analysis in support of the BART Alternative and this metric in no way supports the FIP Proposal.

[191] The U.S. Circuit Court of Appeals for the 10th Circuit explicitly acknowledged that the consideration by EPA of emission reductions occurring at an early point in time is a proper part of a clear weight-of-evidence approach to determining greater reasonable progress. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 938 (10th Cir. 2014).

As explained above and following Utah's lead in the Utah SIP, EPA has assumed that the SIP Proposal produces a greater reduction in aggregate emission reductions of 2,856 tpy compared to the BART Benchmark. This information, however, presumes that the emission units covered under the BART Alternative have emitted at the maximum amount allowable under applicable permits every minute of every day for 365 days each year. In reality, of course, the units do not function in this manner. Therefore, EPA should also take into account the actual emissions from the affected units in considering the aggregate tpy reductions, at least in considering emissions from 2007 until the present. This information is available above in the chart at page 17. By acknowledging that the SIP Proposal – based on actual emissions data – produced even greater emission reductions than EPA (or Utah) had supposed, this gives EPA even more reason to approve the BART Alternative based on this metric.

Response: In its SIP submittal, Utah relied only on the NO_x reductions at Huntington 1 and 2 and Hunter 2 and 3 that occurred between 2006 and 2011 in arguing that the BART Alternative provides for early and ongoing visibility improvement. Given the timing of these reductions, we agree with Utah that they can be taken into account as early reductions in assessing the Alternative. We do not agree with the commenter, however, that EPA should consider the timing of the total tonnage of emission reductions associated with the BART Alternative as "early" beyond those identified by Utah in its SIP submittal.

We acknowledge that EPA proposed to find that other emission reductions from PacifiCorp's Utah facilities could be taken into account as early reductions. After considering the comments received, however, we have concluded that it would be difficult to assess the relative benefit of the timing of later emission reductions under the BART Alternative, given that regional haze SIPs were was due in 2007 and that under the schedule in the Clean Air Act, BART should have been fully implemented by 2014 at the latest. It is accordingly difficult to characterize emission reductions such as the shutdown of Carbon in 2015 as "early." As this is consistent with Utah's SIP submittal, we have decided to consider only those emission reductions that occurred between 2006 and 2011 as lending weight to the argument that the Alternative will provide for greater reasonable progress.

In assessing the BART Alternative, we have taken into account the likely visibility benefit from the emission reductions under the Alternative that occurred from the installation of controls at Hunter and Huntington between 2006 and 2011. We have given some weight to this metric but do not consider the timing of these reductions to be compelling, however, in light of the remaining evidence regarding the comparative visibility benefits going forward.[192]

[192] As explained in this response, while we have taken into account the likely visibility benefit of the early emission reductions in our evaluation of the State's greater reasonable progress than BART analysis, the Clean Air Act requires that all SIPs must include "enforceable emission limitations and other control measures, means, or techniques . . . as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements of [the Act]." CAA Section 110(a)(2)(A); 42 USC 7410(a)(2)(A). Furthermore, regional haze SIPs must include emission limits, compliance schedules, and other measures "as may be necessary to make reasonable progress toward meeting the national goal." CAA Section 169A(b)(2); 42 USC 7491(b)(2). Therefore, in addition to disapproving the provisions in the State's SIP that covered the BART Alternative, we also disapproved provisions in the State's SIP that presented references to and information about emission limits that were created outside the SIP process. Additionally, as discussed elsewhere in this document and the FRN, the presumptive

Comment: [PacifiCorp, p. 63] Utah properly considered The Alternative Program provides emission reductions earlier than required, "providing a corresponding early and on-going visibility improvement." *See* Staff Review, Section VII, page 9. The U.S. Circuit Court of Appeals for the 10th Circuit explicitly acknowledged that the consideration of early reductions was proper as part of a qualitative or clear weight-of-evidence approach to determining greater reasonable progress. *WildEarth Guardians v. E.P.A.*, 770 F.3d 919, 938 (10th Cir. 2014).

Response: As explained in the FRN, we agree that consideration of early reductions is allowed under the weight-of-evidence analysis.

Comment: [Conserv Orgs, p. 31] By using emissions for the Carbon units over the 2012 -2013 timeframe in its comparison of emission reductions achievable under the BART Benchmark compared to the BART Alternative, Utah is not meeting the requirements of 40 C.F.R. §51.308(e)(2)(iv) that emission reductions resulting from the BART alternative "will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP."

Response: The RHR regulations specify that "emission reductions resulting from the emissions trading program or other alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP."[193] We have interpreted this to mean that the State can take credit for all post-2002 emission reductions as of that baseline date. However, there is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs, p. 32] Utah should not be allowed emissions reduction credit for the shutdown of the Carbon units at emission levels that exceeded the emissions as of the 2002 baseline date of the regional haze plan.

Response: There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not

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emission limits in the BART Guidelines are rebuttable; we did not determine here that those limits represent BART and therefore disapproved references in the SIP to those limits. The limits created outside the SIP and references to the presumptive emission limits that we disapproved included: SIP Section XX, D subsections: 6.d. (references to use of approval orders and permitted limits to establish the emission limits, the statement that "the four EGUs also met the presumptive emission rates for both NO_x and SO_2 established in Appendix Y independently of the alternative programs", and references in Table 5 to "Permitted" (and the NO_x and SO_2 limits in that column), "Hunter 3", all provisions in the "Presumptive BART Rates" column NO_x and SO_2 emissions); 6.e. (the provisions in "Schedule for Installation of Controls" as the dates refer to emissions for sources that are in the proposed BART Alternative; and the discussion immediately following Table 6 that presents information about the emission limits also appearing in State-issued permits).

basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs, p. 48] The timing of emissions reductions under Utah's BART Alternative also does not support a "greater reasonable progress" finding.[194]

Response: This comment is responded to elsewhere.

Comment: [Conserv Orgs, p. 25] Utah employed arbitrary assumptions in its Projected Emission Reduction Analysis for the BART benchmark. Namely, Utah arbitrarily assumed that if BART, and not the alternative program, were required at Hunter and Huntington, the Carbon plant would have continued operating after April 15, 2015 at uncharacteristically high emissions levels and without complying with mandatory MATS emissions limits, and that PacifiCorp would somehow remove the most recently installed LNB from Hunter Unit 3 and emit NO_x rates higher than its currently permitted limit. As a result, Utah significantly overstated the overall haze-causing emissions that would occur under the BART benchmark scenario.

Response: We respond to these comments elsewhere.

Comment: [Conserv Orgs, p. 55, 56] The Regional Haze Rule Requires Alternative Programs to Achieve Future Emissions Reductions from BART Sources. Utah's BART Alternative does not satisfy these requirements. In fact, the Alternative relies exclusively on past emissions reductions and largely excludes all BART sources in the state by excusing Hunter Units 1 and 2 and Huntington Units 1 and 2 from future emissions reductions under both the alternative program and BART-derived emission limits.

Response: We respond to these comments elsewhere.

Comment: [Conserv Orgs, p. 57, 58] Utah's Alternative Proposal Conflicts with EPA Precedent, Which Requires Actual Emissions Reductions From BART Sources. First, it is important to note that the CAIR program was specifically identified as a potential substitute for BART and specific requirements for this program are enumerated in EPA's regional haze regulations.[195] This is important because the rules governing CAIR are separate from those governing other "alternative programs" to BART. In addition, CAIR is an interstate SO_2 and NO_x "trading program." Utah's ability to rely on a trading scheme is limited to its participation as a 309 state, thus this proposal must instead be evaluated under the "BART alternative" regulations, relating strictly to emissions of nitrogen oxides and PM. Despite these significant differences between the programs, it is clear that the CAIR program was designed as a forward looking program that would require ***future*** emissions reductions to serve as a substitute for BART. In contrast, Utah's BART Alternative is a backward looking program that seeks to rely solely on past emissions reductions that largely resulted from other regulatory programs, i.e. the Carbon units closures resulted from the MATS program, not from regional haze obligations, and

[194] *See* 81 FR 2004, 2018, 2030.
[195] 40 C.F.R. § 51.308(e)(4).

fail to deliver visibility benefits needed to comply with the Regional Haze Rule's BART obligations.

As with CAIR, emissions reductions under CSAPR are forward, rather than backward, looking. And as with EPA's approval of CAIR as a BART alternative, EPA's approval of CSAPR as a BART alternative applies only to states subject to a FIP or SIP ensuring emissions reductions from the CSAPR trading program for the state's EGUs, which necessarily includes EGUs subject to BART.[196] Thus, like CAIR, CSAPR yields future emissions reductions from BART-subject EGUs. Although the Conservation Organizations do not support EPA's determination that CSAPR is a legitimate BART alternative program, it certainly does not provide precedent for Utah's proposed alternative.

Response: As discussed in the FRN, we disagree that the emission trading requirements in 40 CFR 51.308(e)(4) apply Utah's BART Alternative; and since the RHR establishes the baseline date of the SIP as 2002, a RH SIP can take credit for emission reductions that occur post-2002.

Comment: [Conserv Orgs, p. 59] Closer to home, EPA approved a regional SO_2 trading program under 40 C.F.R. § 51.309 (the "309 Program") as satisfying the better-than-BART requirements for SO_2 in Utah, Wyoming, and New Mexico.[197] Again, the 309 Program is designed to achieve emissions reductions from all EGUs in the three participating states and the emissions reductions are guaranteed by a future cap on emissions growth. While the Conservation Organizations disputed EPA's determination that the 309 Program is better than source-specific BART determinations, the program's scope and timing make it fundamentally distinguishable from Utah's alternative.

Response: We agree that the program scope and timing of the regional SO_2 trading program is fundamentally different from Utah's BART Alternative. While we recognize that the 10th Circuit acknowledged it was proper to consider early emission reductions in evaluating a BART alternative program,[198] the regional trading program elements are very different from Utah's BART Alternative. For example, the regional trading program is an ongoing "backstop" trading program, and the program contains overall emission milestones that decline over time. The emissions from sources that are in the program, BART and non-BART, are tracked each year, and if the total emissions from all the sources exceed the overall emission milestones, the trading program is trigger. If the trading program is triggered, the state and local air agencies participating in the program the provide emission allowances to the sources, and the sources' emissions must be covered by allowances. If a source's emissions are going to greater than the allowance provided by the air agency, then the sources needs to either purchase allowances on the market to cover the additional emissions, or reduce its emissions in some other way. The states participating in the program submitted SIPs to EPA that included regulatory details on these trading program elements, and an analysis that EPA approved under the BART alternative regulations. Therefore, we agree with the commenters that backstop trading program's scope and

[196] *Id.* at 33,647.
[197] *See* Final Rule, Approval, Disapproval and Promulgation of State Implementation Plans; State of Utah; Regional Haze Rule Requirements for Mandatory Class I Areas Under 40 CFR 51.309, 77 Fed. Reg. 74,355 (Dec. 14, 2012).
[198] *WildEarth Guardians v. EPA*, 770 F.3d 919, 938 (10th Cir. 2014).

timing make it fundamentally distinguishable from Utah's alternative given the significant differences between the backstop trading program and the Utah BART Alternative.[199]

Comment: [Conserv Orgs, p. 59] Utah's BART alternative relies almost exclusively on ***past*** emissions reductions from geographically distinct ***non-BART*** sources. EPA has approved BART alternatives at the Four Corners power plant, Navajo Generating Station,[200]Apache Power Plant, Sundt power plant, State of Maryland power plants, and at power plants in Colorado.[201]

Response: This comment is responded to elsewhere.

Comment: [Conserv Orgs, p. 60] For the reasons stated above, Utah's BART Alternative not only fails to comply with EPA regional haze regulations, but also fails to comply with EPA practice and precedent.

Response: As explained elsewhere, we agree.

Comment: [NPS Tech, p. 36] Although EPA did not discuss the "early timing for installation of controls" element prior to its weight-of-evidence discussion, it has introduced this element with little explanation or evaluation. Utah's regional haze SIP was due in late 2007, but its complete SIP was not submitted until 2015. The "early" actions that EPA is crediting to the Hunter and Huntington power plants would likely have occurred well before "between 2019 and 2021" (as EPA speculates), and certainly before the 2018 deadline for BART implementation, had Utah complied with the 2007 deadline. As for the Carbon Plant shutdown, PacifiCorp waited until the last allowable day to close the plant rather than comply with the Mercury and Air Toxics Standard.

Response: The response to this comment is provided in the FRN and elsewhere in this RTC document.

Comment: [UARG, p. 8] In addition, Utah acted well within its discretion in considering the timing of emission reductions under the BART Alternative and emission reductions under the BART Benchmark in its weight-of-evidence analysis. EPA's proposed approval of the BART Alternative observes that "the reductions from the BART Alternative will occur before the BART Benchmark." *Id.* At 2023. Indeed, the BART Alternative emission reductions occur *much* earlier, with reductions from combustion control upgrades occurring since their voluntary

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[199] See, Utah's 309 SIP submittal documents (77 FR 74355 (Dec. 14, 2012)): "Technical Support Document for Technical Products Prepared by the Western Regional Air Partnership (WRAP) in Support of Western Regional Haze Plans", Feb. 28, 2011; and Utah's 309 SIP submittal package (dated June 1, 2011)(both are included in the docket for this final action).

[200] The Navajo Generating Station BART alternative is being opposed by NPCA and Sierra Club. However, the alternative does contemplate future emission reductions beyond historic emission credits.

[201] Final Rule, Arizona Regional Haze, Reconsideration, 80 Fed. Reg. 19,220 (Apr. 10, 2015); Final Rule, Navajo Nation; Regional Haze Requirements for Navajo Generating Station, 79 Fed. Reg. 153 (Aug. 8, 2014); Final Rule, Source Specific Federal Implementation Plan for Implementing Best Available Retrofit Technology for Four Corners Power Plant; Navajo Nation, 77 Fed. Reg. 51,620 (Aug. 12, 2012); Final Rule, Arizona Regional Haze (Sundt Unit 4), 79 Fed. Reg. 52,420 (Sep. 3, 2014); Final Rule, Maryland Regional Haze, 77 Fed. Reg. 38,841 (July 6, 2012) (requiring both emission reductions at BART power plants and future emission reductions); Final Rule, Colorado Regional Haze, 77 Fed. Reg. 76,871 (Dec. 31, 2012).

installation between 2006 and 2014 and reductions from implementation of the remaining BART Alternative measures as of August 2015. *Id.* The BART Benchmark, on the other hand, would not require emission reductions until "sometime between 2019 and 2021." *Id.*

Response: The response to this comment is provided in the FRN and elsewhere in this RTC document.

vii. IMPROVE Monitoring Data

Comment: [PacifiCorp, p. 21] *IMPROVE Monitoring Data* – EPA properly reaches the following conclusions: (i) "anthropogenic visibility impairment on the Colorado Plateau is dominated by sulfates;" (ii) "sulfate is the largest contributor to visibility impairment at the affected Class I areas;" (iii) "SO_2 reductions should provide visibility benefits in all seasons;" and (iv) "visibility benefits associated with NO_x reductions are much more likely to occur [only] in the winter months." See 81 FR at 2023-2024. These conclusions properly support the BART Alternative because it requires more significant reductions of SO_2 emissions as the primary driver of year round visibility improvements. This is true even though the BART Alternative supports fewer reductions of NO_x emissions (compared to the BART Benchmark) because further NO_x reductions do not contribute as significantly to visibility improvement, and even when they do, it is only during very limited times of the year with lower visitation rates in affected Class I areas.

EPA's proposal to disagree with Utah's findings in regard to lower park visitation during the winter season, however, lacks merit. As EPA acknowledges, the BART Guidelines allow for states like Utah to "determine if the time of year is important (e.g., high [visibility] impacts are occurring during tourist season…. States may develop other methods as well." See 81 FR at 2024, footnote 109. EPA's decision to not consider this fact in regard to NO_x emissions under the BART Alternative is directly contrary to the cited BART Guidelines. Utah did not assert, as EPA seems to think, that slow-season, winter month visitors are entitled to less visibility protection than visitors during high-season, summer months. But consistent with the BART Guidelines, Utah properly considered this fact among others under the weight-of evidence analysis. EPA should do the same rather than reject this approach out of hand.

As with the timing metric discussed above, EPA does not attempt to criticize this metric in regard to its FIP Proposal (except for the winter visitor information described above). See 81 FR at 2031. This alone is additional evidence that the IMPROVE Monitoring Data metric should carry great weight in EPA's weight-of-evidence analysis in support of the BART Alternative and that this metric in no way supports the BART Benchmark.

Response: In response to this comment from PacifiCorp, as well as other comments related to monitoring data, we have further assessed the State's evidence for the IMPROVE[202] monitoring metric. We conducted an analysis of 2013 and 2014 IMPROVE monitoring data for

[202] The IMPROVE Monitoring Program deploys aerosol samplers to measure speciated fine aerosols and PM_{10} mass in National Parks and Wilderness areas. These measurements are used to establish the current visibility conditions, track the changes in visibility and determine the causal mechanism for the visibility impairment at Class I areas.

Canyonlands, the most impacted Class I area, considering seasonal averages and the 20% best and worst days.[203] Our analysis confirms that sulfate is a large contributor to light extinction year round and that nitrate contributions are highest in the winter season. Nonetheless, overall nitrate extinction at the affected areas is significant, particularly on the 20% worst days. For example, at Canyonlands on the 20% worst days, nitrate contributed 33% and 17% of total extinction in 2013 and 2014, respectively. Furthermore, as explained elsewhere in this document, it is not possible to gauge the magnitude of visibility benefits associated with emission reductions at particular sources based solely on monitoring data. Thus, we do not agree with the commenter that visibility benefits associated with NO_x reductions will occur *only* in the winter months or that they will necessarily be less significant than benefits associated with SO_2 reductions.

We also disagree with the commenter's assertion that we improperly discounted Utah's findings concerning lower park visitation during the winter season. While EPA recognizes that the BART Guidelines allow states to consider the timing of impacts in addition to other factors related to visibility impairment when making BART determinations, we typically consider this to be true in the context of traditional five-factor BART analyses. Since the State was considering visitation as a weight-of-evidence metric and not as part of a five-factor BART analysis, we find the BART Guidelines visitation reference to be only marginally relevant. Taking into account visitation contradicts the goal of the RHR of improving visibility on the 20 percent best and worst days. Indeed, EPA believes that the experiences of visitors who come to Class I areas during periods other than the peak visitation season are important and should not be discounted.[204] Therefore, we do not agree that more weight should be given to visibility benefits that occur outside of the winter months than those that occur during winter.

Comment: [UDAQ-HT, p. 18] The State has already achieved significant reductions in haze causing pollutants. While the visibility modeling predicted a significant improvement in visibility due to emission reductions made during the current planning period, there has not been an equivalent actual improvement in visibility at the mandatory Class I areas. Based on actual observations, it appears that the current model consistently over predicts visibility benefits. Therefore, the actual monitored data should be considered more heavily than modeling when determining the efficacy of visibility controls. However, to the extent that the model is to be relied upon, the State notes that the alternative to BART scenario shows a greater improvement to regional visibility than requiring SCR to control oxides of nitrogen on the Huntington and Hunter "subject to BART" units.

Response: The commenter did not specify which visibility modeling or which Class I areas it was referring to, so it is not possible for us to evaluate its assertion that the visibility improvement at Class I areas has not been equivalent to that predicted by modeling. However, as a general matter, it is important to note that CALPUFF modeling performed in accordance with the BART Guidelines is not intended to predict the amount of visibility improvement that will

[203] See EPA spreadsheet entitled, Canyonlands IMPROVE Monitoring Data for 2013 and 2014.

[204] As we explained in our proposal, "EPA is proposing to place little weight on the State's correlation of emissions reductions and park visitation because nothing in the CAA suggests that visitors during busy time periods are entitled to experience better visibility than visitors during off-peak periods. On the contrary, in the Regional Haze provisions of the CAA, Congress declared a national goal of remedying all manmade visibility impairment in all Class I areas, which includes both heavily-visited national parks and seldom-visited wilderness areas." 81 FR 2014.

occur under existing conditions. Rather, this modeling is intended to estimate how much visibility improvement would occur under natural visibility conditions. The importance of this distinction and the rationale for using natural conditions as the baseline for CALPUFF modeling is explained in the preamble to the final rule that established the BART Guidelines:

> Using existing conditions as the baseline for single source visibility impact determinations would create the following paradox: the dirtier the existing air, the less likely it would be that any control is required. This is true because of the nonlinear nature of visibility impairment. In other words, as a Class I area becomes more polluted, any individual source's contribution to changes in impairment becomes geometrically less. Therefore the more polluted the Class I area would become, the less control would seem to be needed from an individual source. … Such a reading would render the visibility provisions meaningless, as EPA and the States would be prevented from assuring "reasonable progress" and fulfilling the statutorily-defined goals of the visibility program.[205]

Thus, it would not be surprising if monitoring data that reflect existing, degraded conditions, did not show the same degree of visibility improvement as modeling conducted against clean conditions. Such a discrepancy between modeling results and monitored data does not indicate that the monitored data should be considered more heavily than modeling when determining the efficacy of visibility controls. Rather, it suggests that the modeling results, which are based on clean conditions, should be weighed more heavily than the monitoring data, because "measuring improvement against clean conditions will ensure reasonable progress toward those clean conditions."[206] Finally, for the reasons described elsewhere in this document, we do not agree that the CALPUFF modeling results provided by UDAQ clearly establish that the BART Alternative would result in greater improvement in visibility than the BART benchmark.

Comment: [UDAQ, p. 15] Utah is confident that the SO_2 emission reductions from stationary sources that were the focus of Utah's RH SIP will be effective to further improve visibility in Utah's Class I areas throughout the entire year, including the high visitation period of March through November. The BART Alternative includes further reductions in SO_2 leading to a more certain improvement in visibility than would occur due to the installation of most stringent NO_x controls on the four electric generating units at Hunter and Huntington plants, and these benefits would occur year round.

Based on Utah's findings, EPA correctly found that "visibility benefits associated with NO_x reductions are much more likely to occur in the winter months . . . . By contrast, SO_2 emission reduction should provide visibility benefits in all seasons." 81 Fed. Reg. at 2031. However, EPA errs in disagreeing with the State's findings related to park visitation during different times of the year, explaining that "nothing in the CAA suggests that visitors during busy time periods are entitled to experience better visibility than visitors during off-peak periods." *Id.*

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[205] 70 FR 39124 (July 6, 2005).
[206] *Id.*

Contrary to this reasoning, in the RHR, EPA expressly encourages the use of other ways that visibility improvement may be assessed to inform the control decisions. See 70 Fed. Reg. at 39,130. EPA advises that a state may:

> examine distributions of the daily impacts, determine if the time of year is important (e.g. **high impacts are occurring during tourist season**), consideration of the cost-effectiveness of visibility improvements (i.e. the cost per change in deciview), using the measures of deciview improvement identified by the State, or simply compare the worst case days for the pre- and post-control runs.

Id. (emphasis added). By dismissing Utah's findings related to visitation, EPA ignores the fact that SO_2 reductions, which provide a year-round benefit, will provide a visibility benefit to all visitors. NO_x reductions, however, provide a visibility benefit to visitors during the winter season only.

Response: As explained elsewhere in this document, we do not agree that visibility benefits associated with NO_x reductions will occur exclusively in the winter months or that these benefits will necessarily be less significant than benefits associated with SO_2 reductions. We also disagree with the commenter's assertion that we improperly discounted Utah's findings concerning lower park visitation during the winter season for the reasons explained in response to similar comments from PacifiCorp elsewhere in this section.

Comment: [NPS, p. 3] At Canyonlands National Park peak ammonium nitrate concentrations on winter days can be much higher than ammonium sulfate and frequently cause those days to be among the 20% haziest days. Therefore we do not agree that SO_2 reductions at the Carbon Power Plant are preferred to NO_x reductions at the nearer power plants.

Response: We agree with the commenter nitrate extinction at Canyonlands is significant on the 20% worst days and that SO_2 reductions at the Carbon Power Plant are not necessarily more beneficial than NO_x reductions at the nearer power plants.

Comment: [NPS, p. 3] Further, IMPROVE monitoring data alone are not sufficient to discern the visibility benefits at Canyonlands National Park of previously installed NO_x controls at the Hunter and Huntington Power Plants. The monitoring data represents a synthesis of contributions from local, regional, national, and international sources. As discussed in the enclosed technical comments, we analyzed meteorological back trajectories on winter days in January 2008-February 2015 and found that on roughly 50% of the highest nitrate days, there was transport from the vicinity of Hunter and Huntington Power Plants to Canyonlands National Park. While the trajectory analyses do not define the relative contributions of emissions from these specific sources compared to all other contributing sources in the region, these analyses provide strong evidence that emissions from these power plants affect the park.

Response: We agree with the commenter that IMPROVE monitoring data alone are not sufficient to interpret the contributions of specific emission sources. We also appreciate the commenter's additional evaluation of potential source regions contributing to nitrate particles at the Canyonlands IMPROVE monitor. As acknowledged by the commenter, the HYSPLIT back-trajectory analyses cannot discern contributions from the Hunter and Huntington power plants

relative to other sources. This is because the HYSPLIT model only evaluates the wind trajectory, it does not evaluate emissions or chemical transformations along the trajectory. For example, the northwest sector that includes the Hunter and Huntington power plants also includes a major urban areas, the Wasatch Front, which has high levels of NO_x and ammonia emissions and high ammonia nitrate concentrations in winter. Thus, the HYSPLIT model cannot be used to evaluate the contributions of transport from the different sources along the trajectory. The commenter also provides a probability assessment of the trajectory direction on the 10% highest measured nitrate days. We agree with the commenter's finding that these data do not identify contributions specifically from the Hunter and Huntington power plants on high nitrate days at Canyonlands, but do indicate the Hunter and Huntington facilities are likely contributors on these days.

Comment: [Conserv Orgs, p. 42] The use of monitoring data is inappropriate in the BART context and inconsistent with both EPA's actions elsewhere and the purpose and requirements of the Regional Haze Rule. Even if monitoring information were appropriate to consider, it does not support the conclusion that the BART Alternative provides greater reasonable progress than BART. Neither the monitoring data nor the seasonal use information should be used to dismiss or minimize the modeling results as part of a demonstration under either 40 C.F.R. §51.308(e)(2)(i)(E) or §51.308(e)(3).

EPA must reject Utah's proposed reliance on monitoring data as evidence of "greater reasonable progress" for several reasons. First, BART is a source-specific demonstration that looks at the impacts from the specific source(s) in question without regard to other, non-covered sources. It is difficult, if not impossible in most cases, to tell based on monitoring data alone whether pollutant increases or decreases are caused by emissions from any small subset of sources. There are many variables, including emissions from other sources and meteorological variation that affect the monitoring results. It is therefore not appropriate to use monitoring, which reflects many sources besides those being evaluated, to counter or weigh against modeled benefits.[207]

Second, by design of the regional haze program and the BART Guidelines, the modeled benefits of pollution controls are based on a comparison to natural conditions, not current conditions; monitoring is inherently unable to provide this comparison. While modeled impacts are compared with natural conditions, monitoring demonstrates only current, impaired conditions. Visibility impairment is "non-linear," meaning that any single source's contribution to impairment is geometrically less the greater the impairment.[208] For that reason, the impact of the units in question will appear lower if they are evaluated in the context of other pollution sources. The regulations are clear on the point that BART visibility modeling must be done against a natural background, and allow no justification for lesser levels of control on the basis of existing impairment, which is what monitoring reflects.[209]

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[207] We additionally note that modeling and monitoring conducted on different time scales and thus are not directly comparable. Modeling is evaluated on a daily basis, and in this context, the 98th percentile impact from the given source is typically reported. Visibility monitoring is typically conducted every third day and in this context, is measured in terms of the 20% worst and 20% best days with impacts from all sources.
[208] *Id.*
[209] *See also* Final Rule, North Dakota Regional Haze, 77 FR 20894, 20912 (Apr. 6, 2012) (emphasis added); *North Dakota* v. *EPA*. 730 F.3d 750, 766 (8th Cir. 2013); Final Rule, Texas Regional Haze, 81 FR 296, 324 (Jan. 5, 2016).

Third, it is not clear that in promulgating the option to consider the weight-of-evidence, EPA intended to allow for the review of existing ambient conditions. The reference to monitoring in EPA's final rule comes in the form of the listing items that may be considered as part of a weight-of-evidence demonstration, including "future projected emissions levels under the program as compared to under BART, future projected visibility conditions under the two scenarios, the geographic distribution of sources likely to reduce or increase emissions under the program as compared to BART sources, *monitoring data and emissions inventories*, and sensitivity analyses of any models used."[210] Elsewhere in the text, EPA's references to monitoring exclusively refer to the source emissions monitoring data collected by continuous emissions monitors, rather than to ambient visibility monitoring. In this context, given that it is grouped with emissions inventories rather than listed as its own consideration, it is likely that EPA's intention was to consider emissions monitoring data, not visibility monitoring data. This reading is also most consistent with the program's design, as discussed above.

Response: We partially agree with this comment. While we agree with the commenter that use of monitoring data would not be appropriate in a source-specific BART analysis under 40 CFR 51.308(e)(1), we believe it was appropriate for the State to include monitoring data in a weight-of-evidence analysis for a Better-than-BART demonstration under 40 CFR 51.308(e)(2)(i)(E). EPA routinely allows for the inclusion of air quality monitoring data in weight-of-evidence demonstrations. For example, EPA's *Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze* explicitly lists "[a]nalyses of trends in ambient air quality and emissions" as one of the basic elements of a weight-of-evidence demonstration.[211] Even if it were not clear whether the preamble text cited by the commenter is referring specifically to ambient monitoring data or source emissions monitoring data, the text also clearly states that "weight-of-evidence demonstrations attempt to make use of *all available information and data* [emphasis added] which can inform a decision…"[212] We therefore find that it was appropriate for the State to include an analysis of monitoring data in a WOE analysis for a Better-than-BART demonstration.

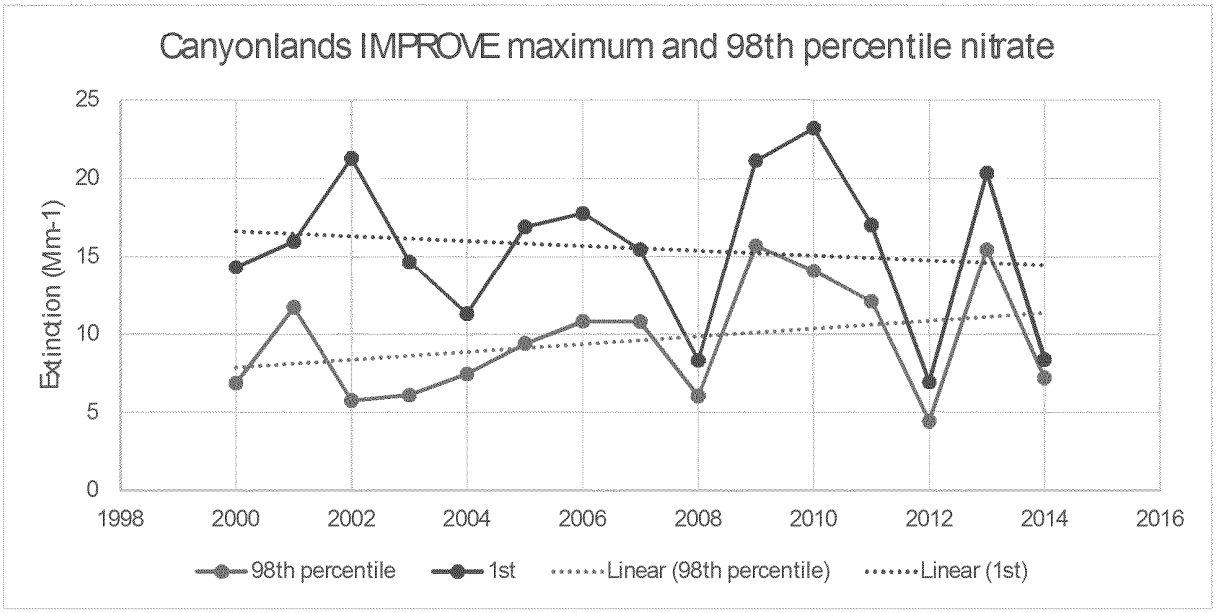
Nonetheless, we agree with some of specific points that the commenter made regarding use and interpretation of monitoring data. In particular, we agree that it is difficult, if not impossible, to tell based on monitoring data alone whether pollutant increases or decreases are caused by emissions from any small subset of sources. We also agree with the commenter that, under the approach set out in the BART Guidelines and used in other source-specific BART Alternatives, modeled impacts are compared with natural conditions, whereas monitoring data reflect current, degraded conditions. In this instance, UDAQ's CALPUFF modeling did evaluate the modeled visibility impacts relative to the natural conditions. As explained elsewhere in this document, we conclude that these modeling results, which are based on clean conditions, should be weighed more heavily than the monitoring data because, "measuring improvement against clean conditions will ensure reasonable progress toward those clean conditions." Moreover, as explained elsewhere in this document, we have determined that the State's analysis based on the monitoring data is inconclusive. Therefore, we are placing greater weight on the State's

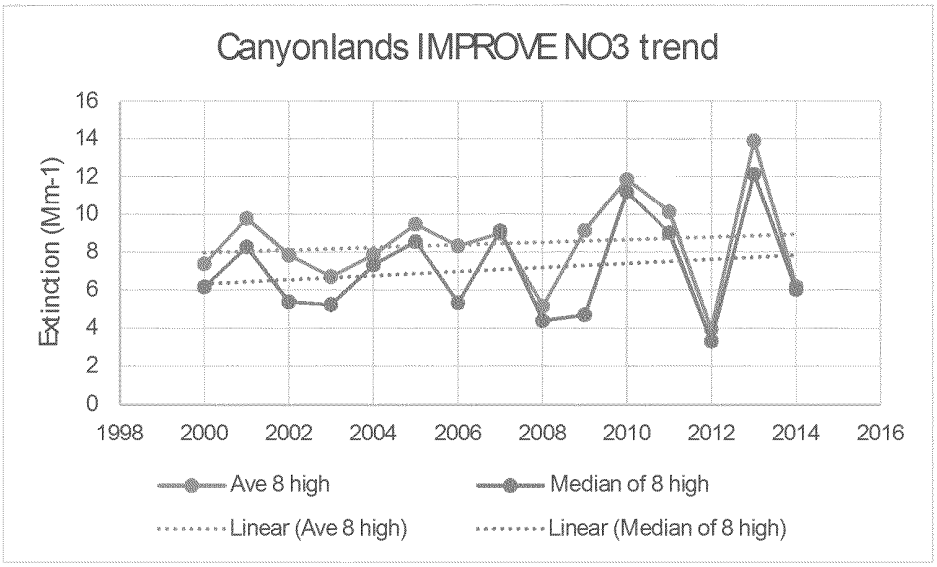
[210] 71 FR 60612, 60622.
[211] EPA-454/B-07-002, April 2007,p. 99.
[212] 71 FR 60612, 60622 (Oct 13, 2006).

modeling results. Our responses regarding Utah's inclusion seasonal park visitor use statistics in its WOE analysis is provided elsewhere in this document.

Comment: [NPS Tech, pp. 2731] UDAQ's September 2014 Staff Review of 2008 BART Determination suggests that the 98th percentile nitrate values are increasing over time, despite decreases in NO_x emissions. As shown above, this is clearly not the case; nitrate concentrations are showing a downward trend. Because ammonium sulfate is decreasing, they suggest that availability of ammonia may be limited and as less ammonia reacts with sulfuric acid (the oxidation product of SO_2 emissions), more ammonia is available to react to form nitrate particles. This may well be the case, which emphasizes the importance of nitrate into the future.

Response: The commenter asserts that the UDAQ is incorrect in its finding that 98th percentile nitrate concentrations have increased over time, and that nitrate concentrations have actually decreased at Canyonlands. However, the commenter's analysis only showed significant decreases in annual average nitrate, not in the 98th percentile nitrate concentration. The commenter acknowledges that nitrate concentrations are highest in winter and that there is no significant trend in winter nitrate concentration over the 2000 to 2014 year period, and that the highest monthly nitrate concentration occurred in 2013. We further evaluated the trends in the nitrate IMPROVE data and note that there is large interannual variability in the highest nitrate days at Canyonlands, and there is a slight, downward trend in the maximum daily nitrate concentration and a slight upward trend in the 98th percentile daily nitrate concentration, consistent with the finding by UDAQ. We agree with the commenter that UDAQ may be correct that as ammonium sulfate decreases, less ammonia will react with sulfuric acid and more ammonia will be available to react to form nitrate particles. This supports the conclusion that NO_x controls will help reduce nitrate, especially as sulfate concentrations continue to be reduced.





Comment: [NPS Tech, p. 31] The data from the ammonia monitoring site at Canyonlands indicate that even in the winter, there is sufficient available free ammonia to produce additional ammonium nitrate. These data do not support a conclusion that ammonia is rate-limiting to nitrate particle formation and in fact would support the need for further NO_x controls to reduce the deleterious effects of ammonium nitrate on visibility.

Response: The ambient monitoring data currently available at Canyonlands is measured as a two week average gas phase concentration using a passive sampler. Because gaseous ammonia and nitric acid exists in thermodynamic equilibrium with aerosol phase ammonium nitrate and sulfate, the partitioning of ammonia between the gas and aerosol phase can vary over the diurnal cycle and from day to day with variations in temperature and relative humidity. For this analysis we are specifically interested in whether excess ammonia is available for the 24 hour average nitrate concentration on the highest nitrate days. The two week average ammonia measurement may include a variety of days with high ammonium nitrate and low ammonia and days with low ammonium nitrate and high ammonia. Thus, the two week average ammonia data cannot be used to determine if nitrate formation is ammonia limited on the highest nitrate days. A more complete set of measurements would be needed to determine if the daily maximum 24-hour average nitrate concentration is ammonia limited, including measurements of gaseous ammonia, nitric acid and sulfuric acid and aerosol ammonium, nitrate and sulfate over the diurnal cycle. Thus, we agree with NPS that the available data are inconclusive as to whether ammonia is rate-limiting to nitrate particle formation at Canyonlands. Furthermore, even if ammonia were rate-limiting, this fact would not undermine the need for NO_x controls. Rather, as explained elsewhere in this section, as ammonium sulfate decreases, less ammonia will react with sulfuric acid and more ammonia will be available to react to form nitrate particles. Without additional NO_x controls, this additional nitrate formation could offset the improvement in visibility that would result from reductions in sulfate concentrations.

Comment: [NPS Tech, p. 35] We agree with UDAQ and EPA that ammonium sulfate occurs year round and that sulfur dioxide reductions "will achieve meaningful visibility improvement." We disagree with UDAQ that IMPROVE monitoring data support a conclusion that the installation of low NO_x burners to reduce emissions between 2006 and 2014 at Hunter and Huntington power plants has not improved visibility at Canyonlands NP; nitrate concentrations are trending down. Because emissions from other sources also could be transported to Canyonlands NP on the highest nitrate days it is not possible to quantify, using the monitoring data alone, the benefit of NO_x emissions reductions at Hunter and Huntington. However, back trajectory analysis indicates that the Hunter and Huntington facilities are likely contributors when high nitrate is observed at Canyonlands NP.

Response: We agree with the commenter that is difficult to evaluate the sources that contribute to the trends in nitrate concentration at Canyonlands using the IMPROVE data alone. For example, there has been a significant increase in oil and gas production activity in the Four Corners region in the last 10 years, and the commenter's trajectory analysis shows that wind trajectories frequently originate in the Four Corners region on high nitrate days. While it is possible that increased NO_x emissions in the Four Corners region have offset the benefits of NO_x emissions reductions in other regions, there is no technical analysis available to evaluate the trends in individual source contributions at the IMPROVE monitor. As discussed in a previous response, we disagree with the commenter that nitrate concentrations at the IMPROVE monitor are trending down on the highest nitrate days, but we do agree that annual average nitrate concentrations have decreased.

Comment: [NPS Tech, p. 36] EPA's third primary element, IMPROVE monitoring data supports the benefit of SO_2 reductions for reducing sulfates, does not negate the value of reducing NO_x emissions. EPA has only once previously approved substituting SO_2 for NO_x reductions, and that substitution occurred within the same facility (Tesoro). IMPROVE data indicate that nitrate is being reduced in all months at Canyonlands NP.

Response: We agree with the commenter that the downward trend in sulfate at the IMPROVE monitoring sites supports the benefits of SO_2 reductions for reducing sulfates, but does not negate the value of reducing NO_x emissions. As discussed in a previous response, we disagree with the comment that the IMPROVE data indicate that nitrate is being reduced in all months at Canyonlands, though we agree that annual average nitrate concentrations have decreased.

Comment: [SCCAW, written statement] Whether reductions occur during peak season of spring-summer-winter at expense of winter, favor max reductions regardless of season.

Response: We note the comment.

Comment: [SCCAW, written statement] SCCAW favors reductions of sulfates over nitrates, if they must choose.

Response: We note the comment.

Comment: [UDAQ-HT, p. 20; UDAQ, p. 14] Our monitoring data indicate that ammonia is the limiting factor in the formation of nitrate and sulfate. Therefore, reducing NO_x and SO_2

emissions is not anticipated to have a corresponding improvement to visibility. Because the visibility modeling uses a much higher value for ammonia than is actually present, this could explain the discrepancy between the model's over prediction and the lack of measured visibility improvement.

Response: With regard to sulfates, we note that UDAQ's comment that reducing SO_2 emissions is not expected to result in a corresponding improvement in visibility contradicts its assertion in its SIP submittal that, based on past trends in SO_2 emissions and sulfate concentrations, it "has confidence that SO_2 reductions will achieve meaningful visibility improvement."[213] With regard to nitrates, as explained elsewhere in this section, it is not possible to determine if nitrate formation is ammonia limited using the measurement data that are currently available for Canyonlands or any of the other affected Class I areas. Furthermore, even if UDAQ were correct that ammonia is the limiting factor in the formation of nitrates, this would not undermine the need for additional NO_x reductions. On the contrary, if nitrate formation is currently ammonia limited, there will be a fixed level of ammonium nitrate until sufficiently large NO_x emissions reductions are implemented such that ambient conditions transition from ammonia-limited to NO_x -limited. Thus, if nitrate is ammonia limited, this fact would support the need for greater NO_x reductions.

Comment: [UPHE, p. 25] The EPA's models of visibility impacts predict that applying BART technology to PacifiCorp's central Utah fleet would significantly reduce the number of haze-impaired days in Canyonlands.[214] DAQ concedes this, but it speculates that, at least in winter, further reducing NO_x might actually increase the concentration of ammonium nitrate (NH3NO3) at Canyonlands (an aerosol that contributes to haze) in a way that the EPA models don't capture. DAQ implies that this possibility is enough to make applying SCR technology to the PacifiCorp fleet that is subject to BART a bad investment risk, regardless of whether reducing NO_x by 87% would significantly reduce haze at other times of the year, and at places other than Canyonlands.

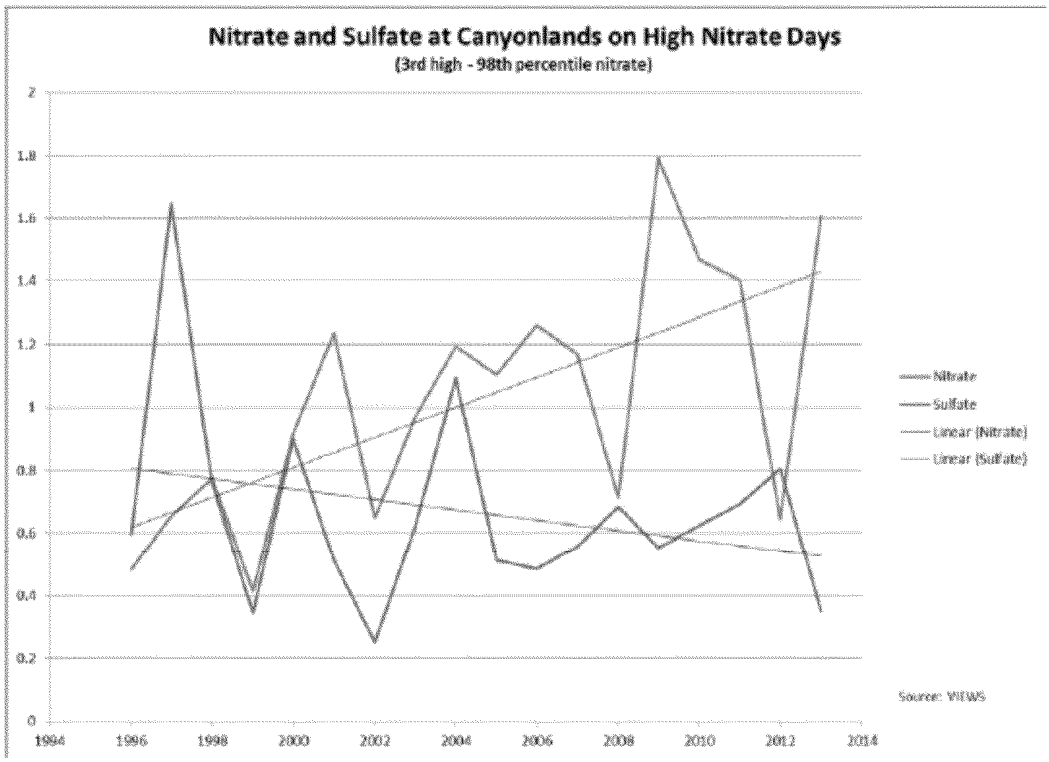
Response: UDAQ does not assert that NO_x emissions reduction will cause increases in ammonium nitrate, rather, UDAQ asserts that ammonium nitrate formation may be limited by the availability of ammonia on the highest nitrate days in winter, and that additional NO_x reductions may have limited benefit if conditions are ammonia limited in winter at Canyonlands. As explained elsewhere in this document, it is not possible to determine if nitrate formation is ammonia limited in winter at Canyonlands using the measurement data that are currently available. We also explain elsewhere our position on the benefit of NO_x reductions in ammonia-limited conditions.

We agree with the commenter that it is important to consider the benefits of emission reductions throughout the year and at all affected Class I areas, not just during the winter months in Canyonlands. The CALPUFF modeling performed by UDAQ includes all days and all affected Class I areas. Accordingly, in evaluating UDAQ's weight of evidence demonstration, we have

[213] Staff Review Report at 13.
[214] See September 12 BART Review, at 25-26.

given more weight to the modeling results than to UDAQ's analysis of IMPROVE monitoring data for Canyonlands.[215]

Comment: [UPHE, p. 25] In its September 12 BART Review, at page 11, DAQ presents Figure 10, which is reproduced below. Once again, DAQ focuses only on the extreme right-hand tail of the distribution (the third-highest day for both NO_x emissions and NO concentrations) which undermines the statistical validity of the trends that it purports to demonstrate. Nevertheless, based on this graph, DAQ speculates that (at least during high-nitrate days in winter) there is enough background ammonia to turn available atmospheric sulfate into ammonium sulfate, and when atmospheric sulfate is depleted, background ammonia then turns nitrate into ammonium nitrate, which would increase winter haze.



Concentrations of sulfate and nitrate have seasonal patterns that are driven largely by changes in ambient temperatures. This is well recognized in the atmospheric chemistry literature. The concentration of gas-phase sulfates is expected to decrease in winter as atmospheric ammonia converts them to ammonium sulfate. Ammonium nitrate formation generally takes place only when sulfate has been fully neutralized.

[215] UDAQ did include 2001-2003 IMPROVE monitoring data for ammonium nitrate and ammonium sulfate (as well as visitation data) for other class I areas in its technical support materials. See Technical Support Documents for Utah's Regional Haze Submittal June 2015, section 5. However, UDAQ did not provide any analysis or discussion of these data, nor did it include more recent monitoring data for other areas.

The literature recognizes that reducing emissions of sulfur oxides and nitrogen oxides can produce a mix of beneficial and adverse effects in terms of their propensity to produce aerosol particulates that reduce visibility. The literature also recognizes the mix of effects can vary with the season. The literature provides recommended strategies for optimizing these seasonally divergent results.

Figure 10 supports a weak inference that unilaterally reducing SO_2 (or, more accurately, reducing SO_2 to a much greater degree than reducing NO_x) is having mixed results on visibility at Canyonlands in winter. DAQ cites this evidence as its main reason for failing to require the installation of BART technology to reduce NO_x emissions from the PacifiCorp fleet by 87%. The academic literature strongly implies that the most effective way to overcome mixed seasonal effects of this kind would be to for the PacifiCorp fleet to reduce NO_x emissions in proportion to the reductions in SO_2 emissions that have already been achieved. This strategy should produce superior results for Utah, just as it is predicted to produce superior results in a number of other regions of the United States.

Response: We note that, in the figure reproduced by the commenter, which appears as Figure 7 in UDAQ's Final (May 13, 2015) Staff Review document, UDAQ presents the trends analysis for the 3rd highest nitrate day, not for the third-highest day for NO_x emissions or NO concentrations. The commenter is correct that ammonium nitrate formation occurs only after the sulfate has been largely neutralized by combination with the available gaseous ammonia. Thus, as noted elsewhere in this document, as ammonium sulfate decreases, less ammonia will react with sulfuric acid and more ammonia will be available to react to form nitrate particles. This supports the conclusion that NO_x controls will help reduce nitrate, especially as sulfate concentrations are reduced.

The commenter also cites photochemical modeling studies using the PMCAMx model that evaluate the effects of NO_x on oxidants and aerosol formation in the eastern U.S. We note that emissions of SO_2 and NO_x and ambient concentrations of sulfates and ammonium nitrates are much higher in the eastern U.S. compared to the western U.S. and that conclusions from photochemical modeling studies for the eastern U.S. may not be relevant for the western U.S. Instead, photochemical model simulations would need to be performed for the western U.S. to evaluate the complex interactions between NO_x, SO_2 and other species and their effects on oxidants and particulate formation. Nonetheless, we agree that the available data suggest that, reducing both NO_x and SO_2 emissions will be an effective strategy for improving visibility at Canyonlands and other Class I areas affected by emissions from the Hunter and Huntington plants.

Comment: [UPHE, p. 22] DAQ makes a technical argument for disregarding the potential impact on visibility of the large reduction in NO_x emissions that it declines to require. It says that the year-to-year rise in nitrate concentrations since 2008 is unexpected given the substantial decline in NO_x emissions from PacifiCorp's central Utah plants over that time. It purports to illustrate the absence of the expected relationship between NO_x emissions and NO_x concentrations with Figure 9 at page 12 of the DAQ September 12 BART Review.

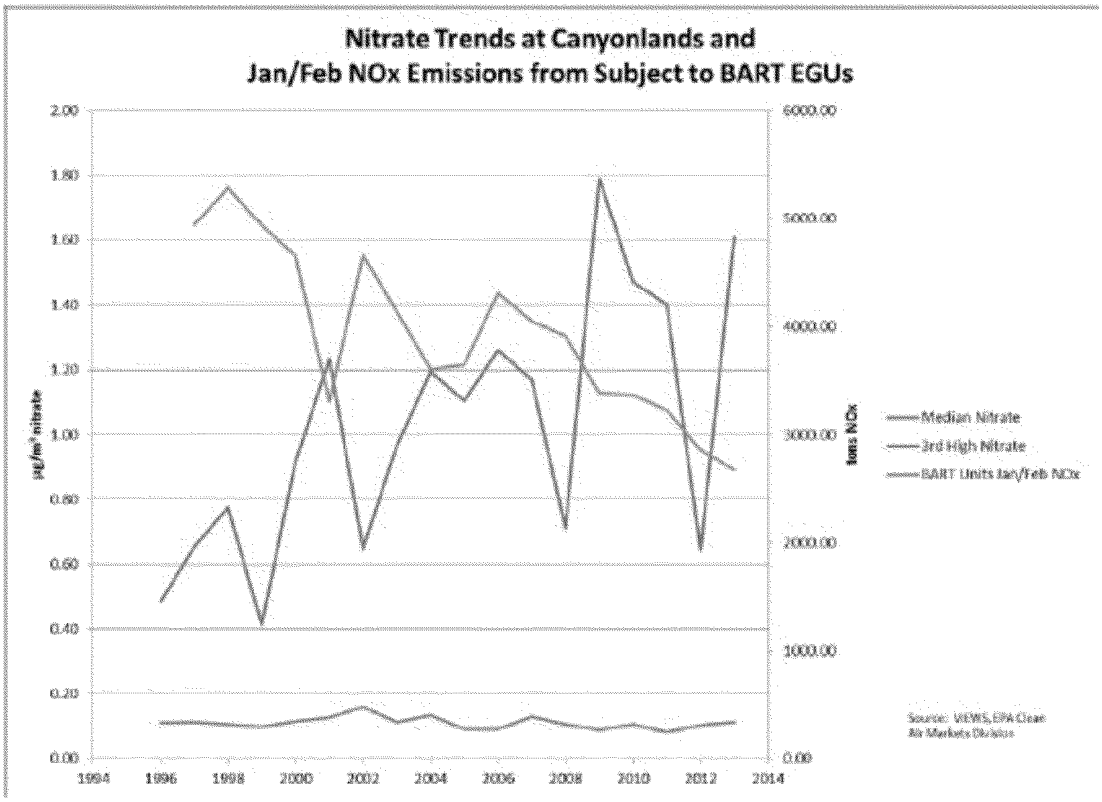


Figure 9 plots wintertime trends in the emissions of NO_x from PacifiCorp's central Utah fleet against the ambient concentration of nitrates at Canyonlands. It plots both mean concentrations and third-highest-day concentrations for each year. DAQ interprets the third-highest-day results as demonstrating that the NO_x emissions and concentrations of NO_x are uncorrelated. Its ensuing discussion suggests that this data demonstrate not just that reducing NO_x from the PacifiCorp fleet would not improve visibility in winter, at Canyonlands, but that it wouldn't improve visibility year round, anywhere in the 360-mile-wide area that is affected by the emissions of PacifiCorp's central Utah fleet.

Figure 9 shows that NO_x concentrations are stable and trend-free when measured at the annual mean, but that they fluctuate wildly when measured on the third highest day of each year. DAQ interprets these fluctuations as evidence that reducing NO_x emissions does not reduce NO_x. These extreme values for NO_x concentrations, however, appear to be too unstable to allow statistically valid inferences to be drawn about the relationship between wintertime NO_x emissions from the PacifiCorp fleet and wintertime concentrations of nitrates at Canyonlands.[216]

According to the academic literature, the persistence of NO_x in the atmosphere increases, and its ability to spread from its source increases, when temperatures drop, humidity goes up, and the atmospheric boundary layer lies close to the surface. (Fei Song, et al., 2011). These conditions

[216] Such large fluctuations are not surprising, since measurements taken on the third-highest day each year are designed to represent the 98th percentile (the far right tail) of the distribution.

describe winter inversions on the Colorado Plateau. Their incidence varies markedly from one winter to the next. The wide fluctuations in the occurrence of extreme concentrations of NO_x in winter in Canyonlands that are reflected in Figure 9 are consistent with similarly wide fluctuations in the occurrence of winter temperature inversions there.

Because atmospheric conditions have such a large effect on concentrations of NO_x in the winter, and because the incidence of extreme atmospheric conditions varies so widely, the behavior of the tail of the distribution of winter NO_x concentrations at Canyonlands provides little basis for discerning the relationship between NO_x emissions and NO_x concentrations in winter in Canyonlands, let alone what that relationship might be during the rest of the year--in Canyonlands, or anywhere else in the 360-mile-wide area that it is impacted by emissions from PacifiCorp's central Utah fleet.

Although Figure 9 isn't sufficient to prove it, emissions of NO_x from PacifiCorp's central Utah fleet and NO_x concentrations at Canyonlands may not be well correlated in winter. The more important question, however, is whether the two are well correlated at Canyonlands throughout the rest of the year (the high visitation part of the year), and whether the two are well correlated at the other Class 1 view sheds on the Colorado Plateau. DAQ makes little effort to answer either of these questions. The answers to these questions, however, are essential to support DAQ's conclusion that it is not certain that reducing NO_x emissions from PacifiCorp's central Utah fleet by 87% would significantly reduce haze *during most of the year over most of the Class 1 view sheds of the Colorado Plateau.* The literature in the field of atmospheric chemistry indicates that reducing NO_x emissions reduces atmospheric concentrations of NO_x and its secondary products for most of the year, in most parts of the United States, as expected.

Response: Initially, we note that "Figure 9" reproduced in the commenter's letter provides information on nitrate concentrations at Canyonlands, rather than NO_x concentrations, as indicated by the commenter. Nonetheless, we agree that the lack of a clear correlation between emissions of NO_x from PacifiCorp's central Utah power plants and nitrate concentrations at Canyonlands in the winter does not provide a sufficient basis to conclude that it is uncertain whether reducing NO_x emissions from these plants would significantly reduce haze during most of the year at all of the affected Class I areas.

Comment: [Conserv Orgs, p. 44] The crux of the argument made by both Utah and EPA is that because SO_2 is the dominant visibility-impairing pollutant and present in all seasons, the SO_2 reductions in the BART Alternative are more important than the NO_x reductions provided under BART. This conclusion is both speculative and irrelevant in this context. NO_x reductions are significant to making reasonable progress at the affected Class I areas and cannot be dismissed.

One element of Utah and EPA's argument is that sulfate is the dominant anthropogenic contributor to visibility impairment at the affected Class I areas.[217] This argument is not relevant to whether or not the BART Alternative provides greater reasonable progress than BART. By statutory mandate, the regional haze program is designed to eliminate visibility impairment from any anthropogenic sources – regardless of the pollutant involved. A deciview of light extinction caused by sulfate is no different from a deciview of light extinction caused by nitrate; thus, the

[217] 81 FR 2004, 2023, 2024.

idea that sulfate provides a greater proportion of impairment generally does not negate the fact that nitrate also contributes to visibility impairment, and that nitrate reductions will provide visibility improvement.

Response: While the commenter has not accurately characterized the findings in our proposal, we agree with the commenter that the fact that sulfate provides a greater proportion of impairment generally does not negate the fact that nitrate also contributes to visibility impairment and that nitrate reductions will provide visibility improvement for reasons explained elsewhere in this section.

Comment: [Conserv Orgs, p. 45] Both Utah and EPA imply that nitrate formation in non-winter months is not significant,[218] or that NO_x reductions will not meaningfully reduce nitrates in non-winter months.[219] Both are untrue. Based on IMPROVE data, light extinction attributable to ammonium nitrate in non-winter months is roughly 20% of that attributable to ammonium sulfate. Despite the preferential formation of ammonium sulfate year round and higher ammonium nitrate formation in winter months, it is clear that significant levels of ammonium nitrate also form in non-winter months, and that these are likely to be lowered by reductions in NO_x emissions. Furthermore, while EPA notes that wintertime conditions favor nitrate formation (versus non-winter),[220] this is accounted for in modeling and cannot be used to discount those results.

Response: The response to this comment is provided in the FRN and elsewhere in this RTC document.

Comment: [Conserv Orgs, p. 45] Utah has not justified or explained its metrics in terms of time frame (e.g. starting with 1996 rather than the either the 1988 start date of measurements at Canyonlands or the 2000 state of the baseline period for the regional haze plan)[221] or impacts and averaging periods. It provides no information about the significance of noted trends.

Response: We agree that Utah did not provide an explanation for its choice of timeframe for its analysis of IMPROVE monitoring data. However, the commenter did not provide an analysis of IMPROVE data trends to show that a different starting year would affect the conclusions based on the UDAQ trend analysis from 1996 to 2013.

Comment: [Conserv Orgs, p. 46] Utah also fails to review information from the other Class I areas that Hunter and Huntington impact. Our review of this data indicates that the suggested pattern is not necessarily replicated at all affected Class I areas.[222] For instance, Capitol Reef is

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[218] UDAQ Staff Review, Exhibit 15 at 17. Winter months in this context are December, January, and February.
[219] 81 FR 2004, 2023 (EPA says that based on a computational model, "We propose to find that visibility benefits associated with NO_x reductions are much more likely to occur in the winter months because this is when aerosol thermodynamics favors nitrate formation.")
[220] 81 FR 2004, 2023.
[221] One way in which this makes a difference is that earlier years (1988 – 1999), fewer measurements were taken per year than in later years (104-105 versus 121-122 in 2001-2013); thus, any relative measure, such as the third highest, may be representative of a different value.
[222] IMPROVE Daily Values Including Patched Values, 1988 – 2013, available at

impacted by Hunter and Huntington at similar levels to Canyonlands.[223] Notwithstanding other potentially appropriate metrics, reproducing Figure 6 for Capitol Reef demonstrates decreasing trends for nitrate, sulfate, and ammonium during both winter and the rest of the year.[224] In sum, Utah has not demonstrated that its evaluation of limited monitoring data invalidates the modeled benefits of NO_x emissions reductions from Units 1 and 2 of both the Hunter and Huntington plants.

Response: We agree with the commenter that Utah did not provide an analysis of monitoring data for the Class I areas that Hunter and Huntington impact other than Canyonlands. In particular, while UDAQ included 2001-2003 IMPROVE monitoring data for ammonium nitrate and ammonium sulfate for other class I areas in its technical support materials,[225] it did not provide analyze or discuss these data, nor did it include more recent monitoring data for other areas. However, we note that the commenter also did not provide an analysis to support its assertion regarding trends in monitoring data for Capitol Reef.

In response to this and other comments concerning monitoring data at other Class I areas, we conducted an additional analysis of monitoring data on the 20% haziest days for all of the affected Class I areas.[226] These data show that between 2000-2004 (baseline period) and 2010-2014 (most recent period for which data are available), the absolute nitrate extinction decreased or remained constant at five of the seven affected IMPROVE monitoring sites, while a sixth site (ZION1) had no monitoring data available for 2010-2014. Only the CANY1 monitoring site (representing Canyonlands and Arches), showed an increase in nitrate extinction over this period. Based on this analysis, we agree with the commenter that trends in monitoring data for CANY1 are not replicated at all affected Class I areas.

Comment: [Conserv Orgs, p. 46] Assuming that ammonium nitrate contributions to winter visibility impairment at Canyonlands were rising in a meaningful way, one theory Utah presents is that the environment is ammonia-limited during the winter. However, there is little information on the actual levels of ambient ammonia or atmospheric dynamics near Canyonlands. In fact, the information relied on by Utah—though from a site in New Mexico—seems to show a trend of increasing ammonia.[227] If applicable to Canyonlands, Utah appears not to have evaluated the impact of potentially increasing ammonia in terms of nitrate trends.

In addition, Utah fails to explain why an ammonia-limited environment—if it is present—argues for fewer NO_x emissions reductions rather than more. If it is true that ammonia, rather than ambient NO_x, is currently limiting wintertime ammonium nitrate formation in Canyonlands, then there will be a fixed level of ammonium nitrate formation until either ammonia is reduced or NO_x emissions are reduced to the point where NO_x is the limiting factor. Thus, greater NO_x emissions reductions may be necessary and justified to achieve the requisite visibility benefits.

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http://vista.cira.colostate.edu/improve/Data/IMPROVE/summary_data.htm.

[223] *See* 2016 Gray Modeling Report, at 15 (table 5).

[224] UDAQ Staff Review, at 15.

[225] See Technical Support Documents for Utah's Regional Haze Submittal June 2015, section 5.

[226] EPA Spreadsheet entitled "IMPROVE Monitoring Trends for Class I Areas Affected by Utah BART Alternative."

[227] UDAQ Staff Review, at 17.

Because Utah has not adequately documented or quantified any of this, and therefore is operating on an unproven theory, EPA should reject it.

Response: We agree with the commenter that insufficient monitoring data are available to determine if nitrate formation is currently ammonia limited or if conditions will be ammonia limited in the future as other sources of SO_2 and NO_x emissions are reduced.
We also agree with the commenter that, if nitrate formation is currently ammonia limited, there will be a fixed level of ammonium nitrate until sufficiently large NO_x emissions reductions are implemented such that ambient conditions transition from ammonia-limited to NO_x -limited. NO_x emissions reductions would be expected to have little benefit for reducing nitrate until that transition point is reached.

Comment: [Conserv Orgs, p. 47] In fact, EPA recognized when it promulgated regulations governing BART-alternative programs that SO_2 emissions reductions alone are unlikely to achieve necessary visibility improvement. There, EPA stated "[i]n limited circumstances, it may be possible for a State to demonstrate that an alternative program which controls only emissions from SO_2 could achieve greater visibility improvement than application of source-specific BART controls on emissions of SO_2, NO_x and/or PM. [EPA] nevertheless believes that such a showing will be quite difficult to make in most geographic areas, given that controls on SO_2 emissions alone in most cases will result in increased formation of ammonium nitrate particles."[228] Accordingly, EPA already has rejected Utah's theory for avoiding further NO_x emissions reductions by substituting SO_2 reductions.

Response: We agree that it would be difficult to make a showing that an alternative program that only controls SO_2 could achieve greater visibility improvement than application of source-specific BART controls on emissions of SO_2, NO_x and/or PM. We note that, while Utah is already implementing an alternative program to control only SO_2 (under section 309 of the RHR), Utah's proposed BART Alternative does not rely on SO_2 reductions alone. Rather, it includes a combination of both SO_2 and NO_x emissions reductions. However, the BART Benchmark includes much larger reductions in NO_x emissions than the BART Alternative.

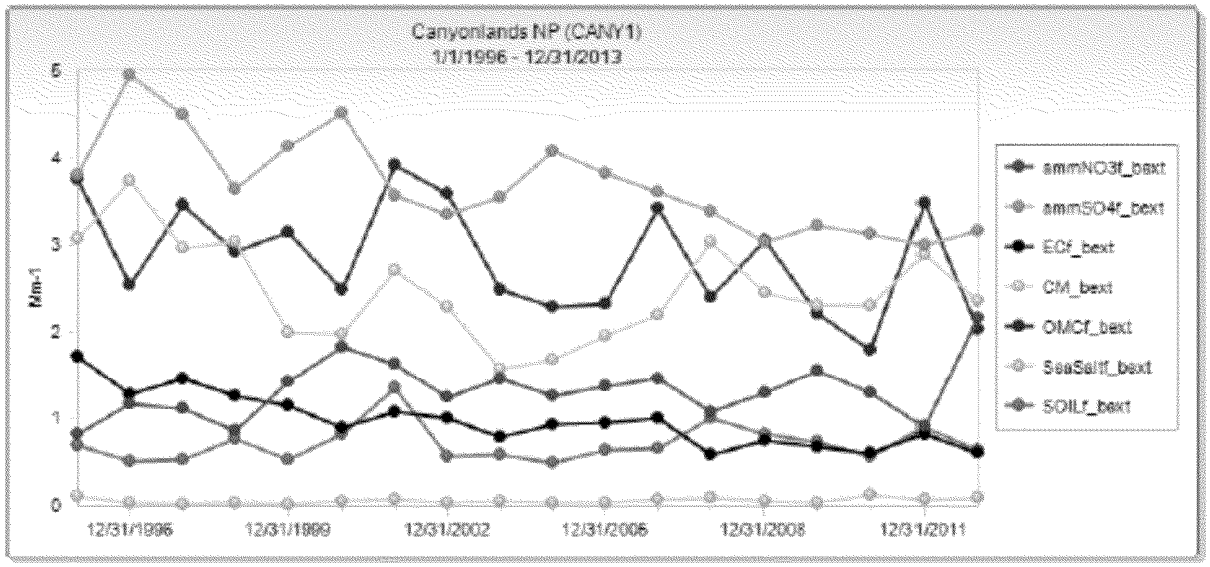
Comment: [Conserv Orgs, p. 47] Finally, EPA cannot allow Utah to use monitoring data to subvert modeled results because doing so would be completely inconsistent with its actions elsewhere, which have not allowed reliance on monitored visibility data and have affirmed the importance of NO_x reductions.

Response: We partially agree with the comment. As stated above, inasmuch as it can be used to inform the analysis, it is appropriate to include ambient monitoring data in a weight-of-evidence analysis for a Better-than-BART demonstration. However, as explained elsewhere in this document, we agree that monitoring data should not be used to subvert modeled results, and, in evaluating Utah's overall WOE demonstration, we have placed greater weight on the modeling results than the monitoring data.

Comment: [UPHE, p. 17] Figure 1 at page 1 of the DAQ staff's September 12, 2014 BART Review Memo is reproduced below. It shows the contributions of the major sources of visibility

[228] 70 FR 44154, 44169 (Aug. 1, 2005).

impairment at Canyonlands National Park, the park most affected by PacifiCorp's central Utah fleet of coal-fired plants. The figure shows that sulfate (in the form of ammSO4) is the most significant contributor to the haze at Canyonlands, but, thanks to recently implemented control measures, it is losing its dominant role. Fire (OMC), dust (CM), and nitrates (ammNO3) are the next most important contributors to haze. In the most recent year reported (2012), nitrates had about two-thirds of the impact on haze that sulfates had. Smoke and dust are not within the DAQ's direct control, but nitrates are. If there is to be significant progress in freeing the Big 5 scenic attractions from the smog that normally enshrouds them, Figure 1 indicates that it will have to come from measures that reduce NO_x, not just SO_2.



Response: We agree with the commenter's assessment of the contribution of visibility-impairing pollutants and the importance of reducing NO_x as well as SO_2 emissions.

Comment: [UPHE, p. 18] DAQ's September BART review tries to build a case for doing nothing with respect to NO_x by noting that there were significant reductions in NO_x emissions by PacifiCorp's central Utah fleet as a result of partial emissions controls that were installed after 2008.[229] It notes that on a yearly basis, the level of nitrates at Canyonlands has been declining, as one would expect if emissions of NO_x are declining.
But for purposes of evaluating the visibility improvements that reducing NO_x would achieve, DAQ regards the annual trend in nitrate concentrations as unimportant. It focuses, instead, on winter, where ambient nitrate concentrations appear to be trending up.

DAQ treated this winter trend in nitrate concentrations as conclusive evidence of the futility of trying to clear the air over Canyonlands, or any other national park in the Colorado Plateau, by further reducing NO_x emissions from PacifiCorp's central Utah coal-plant fleet.

DAQ argued that the contribution of NO_x to regional haze only matters in the winter months because that is when sulfate concentrations fall sharply, and NO_x becomes the dominant

[229] The controls that DAQ required under its regional haze SIP in 2008 were "low NO_x burners and overfire air (LNB + OFA). They remove less than half of the NO_x emissions that BART technology would remove.

pollutant. It noted that visits to Canyonlands fall off sharply in the winter. It concluded that it would be a waste of money to clear the air over Canyonlands and other Class 1 view sheds in winter.

This apparent winter NO_x trend in a single Colorado Plateau location is far too weak a reed to support DAQ's determination not to require BART technology to achieve an 87% reduction in nitrate emissions.

Response: As explained elsewhere in this document and in the FRN, we agree that the trend in nitrate extinction at Canyonlands does not provide a sufficient basis to conclude that reducing NO_x emissions from PacifiCorp's central Utah coal-plant fleet would be ineffective in improving visibility at all affected Class I areas throughout the year.

Comment: [UARG, pp. 8-9] EPA, however, proposes to concur in only one of these state findings: that sulfate is the dominant anthropogenic source of visibility impairment in the affected Class I areas. *Id.* At 2023-24. While acknowledging that sulfate is dominant year-round and that NO_x impacts are much more limited to winter, and without disputing that park visitation is at its lowest in winter, EPA nevertheless proposes to discount these considerations, arguing that "nothing in the CAA suggests that visitors during busy time periods are entitled to experience better visibility than visitors during off-peak periods." *Id.* at 2024. This is a *non sequitur*. The underlying purpose of the CAA's visibility program and its incremental approach to achieving reasonable progress in visibility improvement is based on human perception of visibility impairment. Indeed, the question whether a source is even deemed subject to BART rests on whether that source's contribution to visibility impairment is significant enough to be humanly perceptible. *See, e.g.*, 70 Fed. Reg. at 39,120 & n.32, 39,161. Moreover, as EPA admits in the Proposed Rule, the BART Guidelines expressly permit states to take into account whether impacts occur during the high-visitation season as a factor informing the state's BART control decisions. 81 Fed. Reg. at 2024 & n.109 (quoting 70 Fed. Reg. at 39,130, where EPA states that in determining BART, states may "determine if the time of year is important (*e.g.* high impacts are occurring during tourist season)"). Further, it is improper for EPA to ignore or discount Utah's unrefuted finding that NO_x emission reductions have not been associated with the same levels of visibility improvement that may be attributable to SO_2 reductions.

Response: We disagree with the commenter. While EPA recognizes that the BART Guidelines allow states to consider the timing of impacts in addition to other factors related to visibility impairment when making BART determinations, we typically consider this to be true in the context of traditional five-factor BART analyses. Since the State was considering visitation as a weight-of-evidence metric and not as part of a five-factor BART analysis, we find the BART Guidelines visitation reference to be only marginally relevant. Taking into account visitation contradicts the goal of the regional haze rule of improving visibility on the 20 percent best and worst days. Indeed, EPA believes that the experiences of visitors who come to Class I areas during periods other than the peak visitation season are important and should not be discounted.[230]

[230] As we explained in our proposal "EPA is proposing to place little weight on the State's correlation of emissions reductions and park visitation because nothing in the CAA suggests that visitors during busy time periods are

Comment: [UPHE, p. 22] The argument that sulfates significantly impair visibility year round, but nitrates do so only in winter, is rebutted by DAQ's Figure 1, which is reproduced at page 17 of these comments. That figure shows that the year-round impact of NO_x emissions on visibility at Canyonlands has recently amounted to about two-thirds that of sulfate emissions. Figure 1 provides a more reliable indication than Figure 16 (reproduced on page 20 of these comments) of the relative significance of the impact of NO_x emissions on visibility. Figure 1 shows year-round impacts of emissions on visibility, reflecting the effect of all seasons. Figure 16 shows those impacts only for winter. Visibility impacts for one season should not drive determinations of the value of clearing the air during the other three-quarters of the year when the parks are more heavily visited. It is also important to note that Figure 1 shows the relative impacts that gas phase sulfates and nitrates ultimately have on visibility. The link between ambient aerosols and their gas-phase precursors (such as the NO_x emitted by PacifiCorp's central Utah power plants) is complicated and difficult to model. (C.L. Heald, et al., 2012) Figure 16 shows concentrations of ambient aerosols, but the exact nature of their relationship to their gas-phase precursors is far from clear.

Response: Please refer to our responses concerning seasonal monitoring data elsewhere in this section.

Comment: [UARG, p. 8] Utah also properly based its weight-of-evidence assessment on the relative effects of SO_2 and NO_x emissions on visibility impairment. The state presented evidence that SO_2 emission reductions would more reliably reduce visibility impairment, as compared to NO_x emission reductions, based on IMPROVE monitoring data that demonstrate that sulfates are the dominant visibility-impairing pollutant in the region and evidence that past SO_2 emission reductions have coincided with visibility improvements while NO_x reductions have not been accompanied by similar reductions in visibility impairment. Utah also explained that sulfate-related impairment occurs throughout the year, while NO_x -related impairment is largely limited to winter months. The state added that park visitation rates are higher in periods dominated by sulfate-based impairment. *Id.* These are all reasonable considerations for a state to take into account in a weight-of-evidence approach to evaluating a BART alternative.

Response: We agree with the commenter, and our analysis confirms, that sulfate is a large contributor to light extinction year round and that nitrate contributions are highest in the winter season. Nonetheless, overall nitrate extinction at the affected areas is significant, particularly on the 20% worst days. Moreover, as explained elsewhere in this section, we do not agree that SO_2 emission reductions would more reliably reduce visibility impairment, as compared to NO_x emission reductions. Furthermore, contrary to the State's and others' suggestions that visibility improvements during seasons of peak Class I area visitation should carry more weight, we evaluate the visibility impacts throughout the entire year. Therefore, we have decided to place little weight on this metric and find that the monitoring data analysis metric in Utah's weight-of-evidence analysis only marginally shows the BART Alternative is better than the BART

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entitled to experience better visibility than visitors during off-peak periods. On the contrary, in the Regional Haze provisions of the CAA, Congress declared a national goal of remedying all manmade visibility impairment in all class I areas, which includes both heavily-visited national parks and seldom-visited wilderness areas." 81 FR 2014.

Benchmark. Our full response regarding seasonal visitation rates is found elsewhere in this document.

Comment: [PacifiCorp, p. 63] Utah properly considered that the Alternative Program provides "greater reductions of SO_2, the most significant anthropogenic pollutant affecting Class I areas on the Colorado Plateau that affects visibility year-round…." *See* Staff Review, Section VII, page 9. EPA has approved, or proposed approval, of BART Alternatives on similar grounds. 79 Fed. Reg. at 56,327-28; 79 Fed.Reg. at 33,440-42.

Response: The commenter has mischaracterized EPA's prior actions on BART Alternatives. In the first example cited by the commenter, EPA's proposed approval of a BART alternative for Apache Generating Station in Arizona, EPA noted that the *State* had concluded, based on monitoring and emission inventory data, that SO_2 reductions were more likely to improve class I area visibility than NO_x reductions in the State of Arizona. [231] However, in evaluating the State's analysis, EPA explained that, "we have considered all elements of [the State's] analysis, *but we have given the most weight to the visibility impacts based on air quality modeling*."[232] Thus, while EPA considered the State's analysis of monitoring data, our proposed approval was based primarily on the State's modeling results. Unlike Utah's 98th percentile modeling results for its proposed BART Alternative, Arizona's 98th percentile results showed that the State's BART Alternative would result in improved visibility, on average, across all Class I Areas, compared with BART.[233]

Similarly, in the second example cited by the commenter, EPA relied on CALPUFF modeling results to approve a BART Alternative for the Tesoro Refinery in Washington State.[234] In particular, the 98th percentile CALPUFF results showed that the proposed BART alternative for the Tesoro facility would result in greater visibility improvement at all affected areas, compared with BART.[235]

Thus, contrary to the commenter's suggestion, EPA has not previously approved or proposed to approve BART alternatives based exclusively or primarily on monitoring data. Rather, in the two examples cited by the commenter, we relied primarily on 98th percentile CALPUFF modeling results.

viii. Energy and Non-Air Quality Benefits

Comment: [UAMPS, p. 5] UAMPS also disagrees with EPA's proposals to find that costs and certain other elements Utah considered are not material. EPA must rely on all the elements Utah considered and weigh them collectively in the balance in determining whether the Utah BART Alternative achieves greater reasonable progress. EPA cannot and should not eliminate evidence which does not by itself demonstrate greater reasonable progress by a clear weight-of-evidence. An element weighs one way or the other, and its weight should be taken into account in the

[231] 79 FR 56327 (Sep. 19, 2014).
[232] 79 FR 56328 (emphasis added) (Sep. 19, 2014).
[233] *Id.*
[234] 79 FR 33440-33442 (June 11, 2014).
[235] 78 FR 79355, Table 3 (Dec. 30, 2013).

ultimate balancing. Evidence which shows a benefit in favor of reasonable progress, even if it not compelling by itself, must be weighed in the balance together with all other evidence and not arbitrarily dismissed from consideration. EPA must approve based on the State adequately weighing all the evidence together and not discarding elements which EPA may regard as only providing slight or marginal benefits. Even slight or marginal benefits add to the total weight and must be considered as a whole.[236]

Response: EPA agrees with this comment to the extent that the commenter correctly notes that metrics showing slight or marginal benefits contribute to the total weight of the evidence. We disagree that EPA eliminated from consideration particular metrics on the basis that, taken individually, they were not sufficient to demonstrate greater reasonable progress. Rather, we found that slight or marginal comparative benefits in favor of the BART Alternative for some metrics did not outweigh the relatively large benefit in favor of the BART Benchmark under other metrics, including the 98th percentile metric, which we determined was most relevant to the greater reasonable progress determination.

EPA also disagrees with the commenter's assertions that EPA must rely on all the elements Utah considered in its weight-of-evidence analysis. While a State does have discretion to include metrics in their weight-of-evidence analyses, the CAA requires EPA to exercise independent technical judgment in evaluating whether the content of a State's submission is consistent with the applicable requirements of the CAA and RHR. *See Ariz. ex rel. Darwin v. U.S. EPA*, No. 13-70366, 2016 U.S. App. LEXIS 3196, at *19 (9th Cir. Feb. 24, 2016); (*N. Dakota v. U.S. EPA*, 730 F.3d 750, 761 (8th Cir. 2013). As stated in 40 CFR 51.308(e)(2)(E), a weight-of-evidence analysis is designed to determine whether a BART Alternative "achieves greater reasonable progress than would be achieved through the installation and operation of BART at the covered sources." The RHR defines "reasonable progress" in terms of improvements in visibility. 40 CFR 51.308(d)(1) (States must establish reasonable progress goals, expressed in deciviews, "that provide for reasonable progress towards achieving natural visibility condition."). Thus, EPA is required to assess a State's weight-of-evidence metrics to determine whether they are consistent with the RHR's visibility-driven greater reasonable progress determination.

In reviewing the metrics Utah used to support its weight-of-evidence analysis, EPA determined that two these metrics energy and non-air quality benefits and cost, are not relevant to determining whether the BART Alternative makes greater reasonable progress towards natural visibility than BART.

We address the comments related to cost in Section 1.j.i, and comments related to energy and non-air quality impacts elsewhere in Section 2.b.viii.

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[227] Similarly, in its FIP Proposal, EPA improperly dismisses from the weight-of-evidence evaluation evidence which EPA characterizes as showing "small differences" or "slight comparative benefits" or "not having a direct bearing" on the grounds that these elements of evidence do "not by themselves meet the 'clear weight-of-evidence' test." 81 FR 2032. Also, EPA states that "while some information may show the Alternative is better than BART the information is not adequate to meet the 'clear weight-of-evidence' test." Id. at 2031. EPA is incorrectly applying the weight-of-evidence test by arbitrarily using it to eliminate from the ultimate weighing of evidence those elements which EPA regards as providing only minor benefit. All benefits must be weighed collectively to make a determination if the clear weight-of-evidence demonstrates greater reasonable progress.

Comment: [PacifiCorp, p. 22] *Energy and Non-Air Quality Benefits* [SIP Proposal] EPA concludes that the Energy and Non-Air Quality Benefits identified by Utah "do not have a direct bearing on whether the BART Alternative achieves greater reasonable progress" and therefore are not material to EPA's action on the SIP Proposal. See 81 FR at 2024. EPA, however, is not correct in this conclusion. As explained above regarding EPA's own description of the evidence to be considered in the Weight-of-evidence evaluation: "'Weight-of-evidence' demonstrations attempt to make use of **all available information and data** which can inform a decision while recognizing the relative strengths and weaknesses of that information in arriving at the soundest decision possible." (emphasis added) "All available information and data" includes Energy and Non-Air Quality Benefits because they help to inform greater reasonable progress decisions by causing decision-makers to consider concurrent impacts of a particular action. This is especially true given EPA's repeated reliance on the BART Guidelines to evaluate the BART Alternative (specifically the 98th. Percentile metric), and an evaluation of Energy and Non-Air Quality Benefits are an explicit part of those BART Guidelines. See BART Guidelines at Section IV.D.4.i. Additionally, Congress considered this factor as sufficiently important to specifically include it as part of the five-factor BART analysis requirements. 42 U.S.C. §7491(g)(2). Likewise, this factor should be part of EPA's evaluation of the BART Alternative and EPA should consider the impacts identified by Utah as an additional reason to support approval of the SIP Proposal.

As with the timing and IMPROVE metrics discussed above, EPA does not attempt to criticize this metric in regard to its FIP Proposal. See 81 FR at 2031. This alone is additional evidence that the Energy and Non-Air Quality Benefit metric should carry great weight in EPA's weight-of-evidence analysis in support of the BART Alternative and that this metric in no way supports the BART Benchmark.

Response: EPA disagrees that we must consider metrics under the weight-of-evidence analysis that are not relevant to visibility. As stated in 40 CFR 51.308(e)(2)(i)(E), a weight-of-evidence analysis is designed to determine whether a BART Alternative "achieves greater reasonable progress than would be achieved through the installation and operation of BART at the covered sources." The RHR refers to "reasonable progress" in terms of improvements in visibility. 40 CFR 51.308(d)(1) (States must establish reasonable progress goals, expressed in deciviews, "that provide for reasonable progress towards achieving natural visibility condition."). Thus, only metrics that are indicative of improvements in visibility are relevant in a weight-of-evidence analysis. Energy and non-air quality benefits do not provide any information on whether the BART Alternative results in greater deciviews of visibility improvement at Class I areas than BART.

The fact that energy and non-air quality impacts are part of a five-factor BART analysis is inapposite. Tellingly, these factors do not appear anywhere in 51.308(e)(2), the section of the RHR containing the requirements for BART Alternatives. Rather, energy and non-air quality impacts are relevant to determining the controls that comprise BART. *See* 40 CFR Pt. 51, App. Y IV.E (explaining how to consider the statutory factors, including energy and non-air quality impacts, in choosing between control options that constitute BART). Presumably, the controls a state selects for its BART Alternative will also be reasonable with respect to energy and non-air quality impacts. These factors are thus appropriately considered in choosing controls for the

BART Benchmark and Alternative. However, as stated above, the weight-of-evidence considers only visibility-related factors. Thus, EPA disagrees that it should have considered energy and non-air quality impact in evaluating Utah's visibility-based weight-of-evidence analysis.

EPA disagrees that the fact that we did not criticize the energy and non-air quality impacts metrics in the context of the FIP proposal means that they "should carry great weight" in the weight-of-evidence analysis. As explained above, these factors are properly considered in determining whether a potential BART control measure is reasonable. Our FIP proposal constituted such a BART determination, so was the proper context for considering energy and non-air quality impacts.

Comment: [UDAQ, p. 7] Two additional considerations must be a part of the analysis in deciding whether to impose BART or BART alternative. These are costs of compliance and energy and non-air quality environmental impacts of compliance. The states and EPA are obligated to consider these factors under the CAA. See 42 U.S.C. § 7491(g)(2) (emphasis added) ("[I]n determining . . . [BART] the State (or the Administrator in determining emission limitations which reflect such technology) shall take into consideration the costs of compliance, the energy and non-air quality environmental impacts of compliance . . ."). EPA erroneously decides to entirely dismiss these considerations under either co-proposal. See 81 Fed. Reg. at 2018-19, 2024.

Response: For the response re: cost of compliance under a weight-of-evidence analysis, see Section 1.j.i. For the response re: energy and non-air quality environmental impacts, see elsewhere in Section 2.b.viii.

Comment: [UDAQ, p. 16] EPA erroneously finds that the cost of compliance and energy and non-air quality environmental impacts of compliance "are not material" or "do not have a direct bearing on whether the BART Alternative achieves greater reasonable progress." 81 Fed. Reg. at 2024. Consideration of these factors is not only required by the CAA, 42 U.S.C. § 7491(g)(2), and the BART Guidelines, 40 CFR 51, Appendix Y, § IV.D.4.i., but is also consistent with EPA's own acknowledgement that the "weight-of-evidence" demonstration uses "all available information and data which can inform a decision . . . ," (emphasis added) 81 Fed. Reg. at 2011-12.

EPA should follow the law and its own guidance and assign significant weight to these two factors in evaluating the BART Alternative. This is especially true in light of the substantial impact of these factors when BART is compared to the BART Alternative.

Response: For the response re: cost of compliance under a weight-of-evidence analysis, see Section 1.j.i. For the response re: energy and non-air quality environmental impacts, see elsewhere in Section 2.b.viii.

c. Demonstration That Emission Reductions From Alternative Program Will Be Surplus

Comment: [UARG, pp. 12-13] EPA is, on the other hand, correct to conclude that, in accordance with 40 C.F.R. §51.308(e)(2)(iv), the emission reductions resulting from the BART

Alternative are surplus to the emission reductions resulting from CAA-based measures as of the 2002 SIP baseline date for the regional haze program. As EPA notes, "all of the emission reductions required by the Utah BART Alternative result from measures applicable to Hunter, Huntington and Carbon that occur after 2002." 81 Fed. Reg. at 2025. Further, Utah and EPA have established that the BART Alternative's SO_2 emission reductions will be surplus to those SO_2 emission reductions that are needed to comply with the backstop SO_2 emission trading program under 40 C.F.R. § 51.309 ("section 309 program"). As EPA explains, the Western Regional Air Partnership modeling that formed the basis of the section 309 program's 2018 SO_2 milestone assumed continuing emissions from the Carbon plant. *See id.* Further, SO_2 emissions were already below the section 309 program's 2018 milestone in 2011-2013, when Carbon was fully operational. *Id.*; *see also id.* at 2020, Table 11. In addition, Utah has submitted a further SIP revision in which it commits to add the Carbon plant's historical 8,005 tons per year ('tpy") of SO_2 emissions to the annual milestone reports throughout the life of the backstop trading program to ensure that emission reductions are not double-counted. *Id.* at 2026. Thus, there is no basis – and EPA does not assert that any basis exists – for concluding that the BART Alternative's emission reductions are not surplus to the requirements of other CAA programs in place as of 2002 or not surplus to the SO_2 emission reductions already required pursuant to the section 309 program.

Response: We generally agree with the commenter that the emission reductions Utah relied on in its BART Alternative are surplus to the baseline date of the regional haze program. However, there is some question, raised by other commenters, as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [PacifiCorp, p. 65] ***§51.308(e)(2)(vi)*** – Utah properly concluded that the NO_x, SO_2 and PM emissions reductions resulting from the retirement of Carbon Unit 1 and Unit 2, and the NO_x emission reductions resulting from Hunter Unit 3,[237] "are surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP." Because Utah determined the baseline date of the SIP to be 2002, and because the emission reductions associated with Carbon Unit 1 and Unit 2, and Hunter Unit 3, will occur after that date, the resulting emission reductions satisfy the surplus requirement. *See* Staff Review, Section X, pages 20 - 22. Utah's actions here are consistent with EPA's actions in other states. *See e.g.,* 79 Fed. Reg. at 33,441-42; 79 Fed. Reg. at 56,328.

Response: We generally agree with the commenter that the emission reductions Utah relied on in its BART Alternative are surplus to the baseline date of the regional haze program. However, there is some question, raised by other commenters, as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to

[237] Hunter Unit 3 installed LNB/OFA in 2008. Although the 1990 Clean Air Act Amendments include provisions for reducing NO_x emissions, no specific actions were required at Hunter Unit 3. Under the 1990 CAA, Hunter Unit 3 was classified as a "Phase II" unit and required to meet an annual 0.46 lb/MMBtu emission rate by 2000.

demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [UPHE, p. 8] Including a commitment to non-polluting replacement power in the EPA's first co-proposal is not optional, but mandatory, in our view. The requirement in Utah's "alternative program" to forbear operating the defunct Carbon complex (assuming that this is even a meaningful obligation) has to be coupled with an enforceable commitment by PacifiCorp to replace the lost capacity with power generated by a non-polluting source if Utah's "alternative program" is to actually reduce pollutants (and associated haze) by the claimed increment. Otherwise, the EPA will not have shown that the increment of reduction claimed will, in fact, occur. It will not be "surplus" to the 2002 base period level, and 40 CFR 51.308(e)(2)(iv) will not be met.[238]

Response: The response to this comment is provided in the FRN.

d. Carbon Power Plant Closure

Comment: [Conserv Orgs – Gray Report, p. 4] I also examined a BART scenario in which it was assumed that, if the Carbon plant had continued operating beyond April 15, 2015, then a substantial SO_2 emission reduction would have had to occur at the Carbon facility to comply with the emission standards contained in the Mercury and Air Toxics Standards for Power Plants (MATS) rule. For this modeling scenario ("BART with MATS"), the modeled visibility metrics overwhelmingly favor the BART with MATS scenario over Utah's BART Alternative at all affected Class I areas.

Response: We agree with the commenter that, had the Carbon plant continued to operate beyond April 15, 2015, the emissions controls to comply with the MATS rule would have resulted in substantial SO_2 emission reductions. However, there is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: [Conserv Orgs – Gray Report, p. 27] For both the modeled annual average delta dv (Table 16) and the modeled 90th percentile delta dv impact (Table 17; 110th high out of 1095 days), there is an overall reduction in visibility impairment across all the Class I areas for the Corrected SO_2 BART Benchmark scenario as compared to Utah's BART Alternative scenario, although the overall differences are relatively small, and there are a few Class I areas for which the Corrected SO_2 BART Benchmark scenario would have very minor increases in impairment. However, there were much larger impacts at the two higher-impacted Class I areas (Canyonlands NP and Capitol Reef NP) for the BART Alternative scenario.

[238] 40 CFR 51.308(e)(2)(iv) states: A demonstration that the emission reductions resulting from the emissions trading program or other alternative measure will be surplus to those reductions resulting from the measures adopted to meet requirements of the CAA as of the baseline date of the SIP.

Table 17. Modeled 90th Percentile Delta dv

	Alternative	Corrected SO_2 BART	Corrected SO_2 BART vs. Alternative*
Arches National Park	1.86	1.93	-0.07
Black Canyon of the Gunnison National Park	0.40	0.43	-0.03
Bryce Canyon National Park	0.19	0.21	-0.03
Canyonlands National Park	2.45	2.12	0.33
Capitol Reef National Park	1.23	1.12	0.11
Flat Tops Wilderness	0.47	0.53	-0.07
Grand Canyon National Park	0.22	0.23	0.00
Mesa Verde National Park	0.43	0.48	-0.05
Zion National Park	0.07	0.08	-0.02
Average (All 9 Class I Areas)	**0.81**	**0.79**	**0.021**

* Positive values favor Corrected SO_2 BART (lower modeled visibility impact); negative values favor ALT

The uncertainty associated with the assumed SO_2 emission rates for the Carbon facility casts considerable doubt on the veracity of Utah's modeling results and the comparison of the visibility metrics between Utah's BART Alternative and the BART Benchmark scenarios. As demonstrated above, if the assumed SO_2 emission rates for Carbon were even slightly lower than those assumed in Utah's modeling, the results would shift to the BART Benchmark being better than Utah's BART Alternative for ALL the visibility metrics. Given the uncertainty in correctly identifying the SO_2 emission rates that would have likely occurred at the Carbon facility in the future, it is difficult to rely on the comparisons of the metrics based on Utah's modeling (with their overstated SO_2 emission rates) to support a "better than BART" demonstration. The modeling above, using the corrected SO_2 BART emission rates for the Carbon facility, demonstrates that a relatively small reduction in the assumed SO_2 emission rates will, instead support a determination that the BART Benchmark is actually better than Utah's BART Alternative.

Response: There is some question as to whether Utah should have taken credit for emission reductions at Carbon from a starting point that exceeds its emissions as of 2002. We are not basing our disapproval of the State's Alternative on a determination that it failed to demonstrate that emission reductions were surplus to the baseline date of the SIP, but we do note that a state must take a reasonable approach to assessing whether a BART alternative will provide for greater reasonable progress than BART.

Comment: **[Conserv Orgs – Gray Report, p. 32]** Considering that Utah failed to model the significantly reduced SO_2 emissions required by MATS if the Carbon facility had continued to operate beyond April 15, 2015, EPA may not accord any confidence that Utah's modeling results accurately shows that Utah's BART Alternative results in greater visibility improvement than does the BART Benchmark. If the SO_2 emission rates for the Carbon facility are overstated, by even a small amount, the model results using the Corrected SO_2 BART Benchmark scenario (as well as the BART with MATS scenario) show clearly that Utah's BART Alternative scenario will result in more visibility impairment than the BART Benchmark scenario. Therefore, Utah's

BART Alternative scenario has not been shown to be"better than BART" by the "clear weight-of-evidence."

Response: Our response to how Utah projected Carbon's SO_2 emissions is found elsewhere in this document.

Comment: [Conserv Orgs, p. 2] Most troublingly, Utah assumed unrealistically high future emissions from the Carbon Plant based on unfounded speculation that the Plant's future emissions would greatly exceed representative past emissions and that the Plant would not be required to comply with federal Mercury and Air Toxics Standards that compel significant SO_2 emissions reductions industry wide. When these errors are corrected, it is abundantly clear that compliance with BART would achieve far greater visibility benefits than Utah's proposed BART Alternative. As such, EPA is legally prohibited from approving the State SIP.

Response: The response to this comment is provided in the FRN and elsewhere in this document.

Comment: [Conserv Orgs, p. 25] Utah's assumed emissions from the Carbon Plant in its "BART benchmark" scenario are erroneous, fatally biasing Utah's comparison of BART to the BART Alternative. As an initial matter, the Carbon Plant was permanently closed on April 15, 2015 and is in the process of being dismantled. Thus, Utah's assumption that these units could continue to emit pollutants at 2012 inflated emission rates is factually inaccurate and defies reality.

Response: The response to this comment is provided in the FRN and elsewhere in this document.

Comment: [Conserv Orgs, p. 27] the requirement to permanently retire Carbon Units 1 and 2 by April 15, 2015 was made enforceable through public service commission filings in several states.

Response: Our responses regarding the appropriateness of including the Carbon plant closure in Utah's BART Alternative are provided elsewhere in this document and in the FRN. The enforceability of public service commission filings is not relevant to this final action

Comment: [Conserv Orgs, p. 61] Utah's BART Alternative is unapprovable for another reason: it improperly double-counts SO_2 emissions reductions occurring as the result of the Carbon Plant closure both to satisfy its NO_x BART requirements and to satisfy its commitment under 40 C.F.R. § 51.309.

Response: The response to this comment is provided in the FRN.

Comment: [Conserv Orgs, p. 63] The Carbon plant is not a BART source and any emissions reductions from this source cannot be used to excuse upgrades at BART sources in this context.

Response: The response to this comment is provided elsewhere.

Comment: [UPHE, p. 6] The closing of the Carbon complex was a *fait accompli* by the time the Utah revised its rationale for its BART "alternative program" in 2015, for reasons that are unrelated to reducing regional haze. Nevertheless, according to Utah's Division of Air Quality, agreeing to not reactivate that complex (together with modest NO_x -reducing retrofits that DAQ had previously ordered PacifiCorp to make on its surviving BART-eligible fleet) qualifies under EPA's regional haze rules as a comprehensive alternative to requiring PacifiCorp to install the Best Available Retrofit Technology (BART) on each of its surviving central Utah power plants to reduce the level of nitrogen oxides (NO_x) that are currently emitted by those plants.

Response: The response to this comment is provided in the FRN.

Comment: [UPHE, p. 7] The Carbon complex is not subject to the EPA's regional haze rules because of its age and its closing was not related to regional haze effects.[239] Nevertheless, the requirement in Utah's State Implementation Plan that PacifiCorp not put the closed Carbon complex back on line, in Utah's view, constitutes the key element of an "alternative plan" that "covers" the four surviving plants in PacifiCorp's central Utah fleet.

Response: Comment noted.

Comment: [UPHE, p. 14] The Carbon Plant is now closed and PacifiCorp's transmission system has been reconfigured to adapt to that fact. The fact that PacifiCorp couldn't meet the EPA's new mercury restrictions without closing the plant is just one of many additional reasons that it had to close the Carbon Plant and that there is no realistic prospect of reopening it. Even if the new mercury rule were to be overturned by the courts,[240] the EPA's new, tighter ozone standard issued in October of this year is highly likely to be violated in Utah's national parks, since they are occasionally in violation of the existing, more lenient standard. Because NO_x is the main precursor to ozone formation, complying with a new, tighter ozone standard is very likely to require Utah to draw up a State Implementation Plan that includes a major reduction in the amount of NO_x emitted by the four PacifiCorp generating units that are subject to BART.

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[239] The BART requirements of the regional haze rule apply to facilities built between 1962 and 1977 that have the potential to emit more than 250 tons of visibility-impairing pollution. There are 26 categories of covered facilities, including utility and industrial boilers.

[240] The EPA is not likely to withdraw its mercury rule, and recent events make it unlikely that the courts will delay or overturn it. In June of 2015, in Michigan v. Environmental Protection Agency, the Supreme Court ruled that the E.P.A. should have taken the costs of implementing its mercury rule into account when it decided whether the rule was "appropriate and necessary," rather than taking costs into account to decide the specific form that the rule would take. The flaw identified in the rule was procedural rather than substantive. The Supreme Court remanded the case to the D.C. Circuit Court to instruct the EPA to make a new "appropriate and necessary" determination that explicitly considers costs. In December, 2015, the utilities asked the D.C. Circuit Court to stay implementation of the mercury rule until the EPA's determination is complete and has been reviewed by the court. They cited as precedent the Supreme Court's stay of the Clean Power Plan until judicial review of that plan is complete. The D.C. Circuit left the rule in force, noting that the EPA pledged to complete its reanalysis by April 15, 2016. The utilities then made the same request Chief Justice Roberts. On March 3, 2016, he also refused to issue a stay of the mercury rule. By allowing the mercury rule to remain in force pending judicial review, he signaled that the Court regards the stay of the Clean Power Plan as unique, and is not likely to stay the EPA's other proposed rules to limit pollution by the electric power industry.

Response: Comment noted. We take no position on the commenter's unsupported speculations about the implications of EPA's new ozone standard.

Comment: [UPHE, p. 15] The EPA's regional haze rule requires "reasonable progress towards achieving natural visibility conditions" by 2064. Utah's strategy for meeting this requirement will require a new State Implementation Plan in three years (2018). Utah's DAQ recognizes that it will have to incorporate substantial further reductions in NO_x in that SIP. Id. at 28. The Carbon Plant had to close and it has to stay closed if PacifiCorp is to meet any of these pending regulatory requirements.

Response: Comment noted. We take no position on the commenter's unsupported speculations about the Carbon plant needing remain closed to meet pending regulatory requirements.

Comment: [Transcript pp. 58, 60-61] One commenter talked about attending a meeting in 2013 to discuss the closure of PacifiCorp's Carbon plant. The reasons given at the meeting for closing the facility were to meet the new MATS and regional haze requirements. Another commenter noted that the Carbon plant has ceased operation as agreed in the state plan. Yet another commenter noted that EPA only used data "in their report" with the three PacifiCorp plants running and has not supplied any data since the Carbon plant shut down.

Response: Comments noted. It is unclear what the commenter intended who discussed data related to the Carbon shut down. We note that Utah's BART Alternative analyzed metrics based on CALPUFF modeling that included a scenario with the Carbon emissions set to zero.

Comment: [Transcript pp. 114-115] One commenter asserted that no data or improvements in measurable haze have been provided to the public from the Carbon plant shutting down to drive additional restrictions.

Response: IMPROVE monitoring data is not yet available for 2015, so it will not yet possible to evaluate the effects of the Carbon plant shutdown.

Comment: One commenter noted that the Carbon Plant shutdown was due to that facility being very old and inefficient, not because it was a big polluter.

Response: Comment noted, and we take no position on the commenter's speculations.

Comment: [NPS Tech, p. 2] Of 1,222 plants, CAM data for 2014 rank the Carbon facility #104 for SO_2 at 9,241 tons and #157 for NO_x at 3,270 tons. The Carbon Plant's high emissions relative to its size can be attributed to its lack of emission controls for SO_2 and NO_x. On an emission per unit of electrical output basis, Carbon ranked #34 worst for SO_2 and #31 worst for NO_x. Carbon also ranked #165 for emissions of CO2 per unit of electricity produced.
Response: We generally acknowledge the data presented in the comment but have not based any of our final determinations on the commenter's assessment of the Carbon plant's ranking in emissions compared to other plants.

Comment: [Conserv Orgs – Gray Report, pp. 3-4] I determined that the comparisons of the BART Alternative and the BART Benchmark are very sensitive to the assumed baseline SO_2

emission rate for the Carbon facility. The modeled baseline emission rates for the two Carbon units (under the BART Benchmark scenario) were estimated by Utah using recent emission data for which the SO_2 emissions were much higher than during many previous recent periods when lower sulfur coal was primarily being used at the facility.[241] If the SO_2 emission rates from the Carbon facility are overestimated by even a modest amount, then the comparison of the BART Alternative to the BART Benchmark will produce quite different conclusions regarding the merits of each scenario, as demonstrated below. Including a relatively small "correction" in the assumed baseline SO_2 emission rates for the two Carbon units results in an unambiguous determination that the BART Benchmark would achieve greater reasonable progress than the BART Alternative, and therefore, that the BART Benchmark is better than the BART Alternative. The uncertainty in Utah's assumed SO_2 emission rates for the Carbon facility casts considerable doubt Utah's visibility modeling and on the veracity of Utah's comparison of the visibility metrics between the two scenarios.

Response: The response to this comment is provided elsewhere in the document and in our FRN.

Comment: [NPS Tech, p. 11] Use of these abnormally high short-term [SO_2] emission rates biases[242] the modeling results against BART and in favor ofthe BART Alternative by inflating the emission rate for Carbon Units 1 and 2 prior to the ir shut-down as part of the BART Alternative. In effect, PacifiCorp is being "rewarded" for havin g short periods of unusually high emissions. EPA should consider use of more representative emis sion rates when accounting for emission reductions.

Response: The response to this comment is provided elsewhere in the document and in our FRN.

Comment: [Conserv Orgs, p. 29] Utah should not be allowed any more emissions-reduction credit for the shutdown of the Carbon units than existed at the time of the baseline date of the regional haze SIP.

Response: The response to this comment is provided elsewhere in the document and in our FRN.

e. Hunter Unit 3 and Permit Issues

Comment: [Conserv Orgs, p. 50] A recent compliance review completed by the Sierra Club as part of Utah's proposed issuance of a Title V renewal permit for the Hunter plant indicated that Hunter Unit 3, as well as Hunter Units 1 and 2, constructed projects in the 1996-1999 timeframe that should have triggered prevention of significant deterioration ("PSD") permitting requirements and best available control technology ("BACT") as major modifications of NO_x, SO_2, and PM_{10}.[243] Therefore, PacifiCorp was obligated to install NO_x pollution controls to meet BACT at Hunter Unit 3 prior to the baseline date of the SIP and therefore the NO_x emissions

[241] *See* Technical Support Document of Vicki Stamper dated March 14, 2016, p.33.
[242] These unusually high SO2 emission rates occurred in September of 2012 and July of 2014 simultaneously at both units, probably due to high sulfur coal. (FN 22 in NPS document).
[243] *See* November 13, 2015 letter from William J. Moore, III, to Utah Division of Air Quality, with comments submitted on behalf of Sierra Club, at pp. 6-49 (Ex. 22 attached hereto).

reductions achieved with the 2007 installation of low NO_x burners are not surplus and cannot be credited in the State's BART Alternative.[244]

Response: EPA recently received a petition from Sierra Club requesting that EPA object to the Title V renewal permit issued by Utah arguing, among other things, that PSD should have been triggered. We are investigating the issues raised by the Title V permit but have no conclusions at this time as to whether PSD requirements were triggered. Thus, there is uncertainty regarding the issues raised in the petition for the Hunter plant that was filed with EPA's Administrator; this places additional uncertainty on whether the State's BART Alternative is better than BART. Even if, as commenters argue, Utah were precluded from taking credit for the 2007 emissions reductions in support of its weight of the evidence demonstration, EPA's overall conclusion that a FIP is necessary because the weight-of-the-evidence does not support the proposed BART Alternative approach would not change.

Comment: [Conserv Orgs, p. 52] As detailed by Sierra Club in its November 2015 comments to Utah, the 1997 Approval Orders were based on an unlawful and improper applicability test of evaluating emissions changes based on an apparent allowable-to-allowable emissions basis.[245] The pre-project actual baseline emissions of the Hunter units were much lower than the "PSD baseline emissions inventory" relied on by UDAQ to reflect the Hunter Units' baseline emissions before the projects authorized in the 1997 Approval Order.[246]

Response: The response to this comment is addressed elsewhere in this document

Comment: [Conserv Orgs, p. 54] Assuming Hunter Unit 3 should have obtained a PSD permit for NO_x and other pollutants in 1997, then the unit should have been subject to best available control technology (BACT) for NO_x as part of that permit. It is thus very unlikely that the 2007 NO_x emissions reductions at Hunter Unit 3 were surplus.

Response: The response to this comment is addressed elsewhere in this document.

Comment: [Conserv Orgs, p. 54] Specifically, in a 2011 filing with the Utah Public Service Commission, Cathy Woolems of MidAmerican Energy (of which PacifiCorp is a subsidiary) referred to a 2003 information request made by EPA under Section 114 of the Clean Air Act regarding the Hunter plant (among others) and stated:

> In an effort to avoid the negative consequences of a New Source Review enforcement action, the Company has kept EPA apprised of its emission reduction effort. It is the Company's

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[244] In the November 2015 comments from Sierra Club to Utah on the draft Hunter Title V renewal permit, Sierra Club provided comments, analysis, and exhibits to show that BACT would be based on installation of selective catalytic reduction (SCR). *Id.* at 83-87. *See also* Report of Matt Haber: Best Available Control Technologies for the Baldwin Generating Station, Baldwin, Illinois (April 2002), prepared for the United States in connection with United States v. Illinois Power Company and Dynergy Midwest Generation, Inc., (cv-99-833-MJR, S.D. IL) ("Haber Expert Report") (Ex. 23 attached hereto).

[245] *See* November 13, 2015 letter from William J. Moore, III, to Utah Division of Air Quality, with comments submitted on behalf of Sierra Club, at 9-49) (Ex. 22.)

[246] *Id.* at 2-27.

belief that that had it not been engaged in a reasonable program to reduce its emissions through the installation of controls, the EPA would likely have pursued an enforcement action.[247]

Response: We appreciate the commenter but the comment poses no question nor has bearing on the proposed rule.

Comment: [Conserv Orgs, p. 55] EPA must take all of this information into account in determining whether the clear weight of the evidence supports a finding that the NO_x emissions reductions at Hunter Unit 3 made in 2007 with the installation of upgraded low NO_x burners were surplus emissions reductions. The Conservation Organizations' contend that the clear weight of the evidence provided above and in the cited exhibits does not support a definitive finding by EPA that the NO_x emissions reductions achieved at Hunter Unit 3 were in fact surplus.

Response: The response to this comment is addressed elsewhere in this document.

f. BART Alternative CALPUFF Modeling

Comment: [Conserv Orgs, p. 25] Moreover, even assuming for the sake of that the Carbon Plant would continue operating under the BART scenario, Utah's assumed future SO_2 emissions from the plant are unrealistically high. First, Utah's "BART benchmark" scenario identifies the plant's emissions from 2012-2013, which were significantly greater than in previous years. As explained in the attached Stamper TSD, the Carbon plant's SO_2 emissions over the 2012-2013 timeframe were significantly greater than Carbon's historical emissions.[248] While Utah assumed that Carbon's peak emissions in 2012-2013 of 3,160 lb/hr would continue under the BART scenario, the longterm trend shows otherwise, with Carbon's median maximum daily SO_2 emissions from 2001 to 2014 (2,506 lbs/hr).[249]

Response: For the Carbon power plant, the commenter suggests disparate baselines for establishing emission rates for 1) visibility modeling, and 2) analysis of annual emissions (in a separate comment). In the case of visibility modeling, the commenter suggests that the median highest daily emission rates from 2001 through 2014 be used. By contrast, in the case of the annual emissions, the commenter suggests that the 2001-2003 annual average be used. In both cases, the approach suggested by the commenter would have the effect of tilting the WOE towards disapproval of Utah's BART Alternative SIP**.** Here we address the emission rates used for visibility modeling purposes. Refer to our responses elsewhere in regard to emission rates used for analysis of annual emissions.

The emission rates used by Utah for visibility modeling purposes were established in the modeling protocol for the BART Alternative that was developed in consultation with EPA. See

[247] 2011 Rebuttal Testimony of Cathy S. Woolems before the Utah Public Service Commission, Docket 100-035-124, at 10 (Ex. 31 hereto), downloaded from Utah's Public Service Commission website at http://www.psc.state.ut.us/, under Docket Number 10-035-124 (last accessed March 8, 2016).
[248] 2016 Stamper TSD, at 33-42; *see also* 2016 Gray Modeling Report, at 23.
[249] 2016 Stamper TSD, at 42 (Table 10); 2016 Gray Modeling Report, at 24.

proposed rule at 81 FR 2033. These emission rates were also generally established in accordance with the BART Guidelines which directs States to "[u]se the 24-hour average actual emission rate from the highest emitting day of the meteorological period modeled (for the pre-control scenario)." 70 FR 39170. An exception is the modeled emission rates for the Carbon Power Plant, where instead of using the emissions from the highest emitting day from the meteorological period modeled, 2001-2003, Utah used the highest daily emission rates from a period reflective of actual emissions from a more recent period, 2012-2013. However, the highest daily SO_2 emission rates (combined rates for Units 1 and 2) from these two periods are nearly equal: 3,171 lb/hr for 2001-2003, and 3,160 lb/hr for 2012-2013.[250] Because the difference in these two daily emission rates, 11 lb/hr (or 0.35%), is trivial, it has no consequential impact on the modeled visibility metrics that Utah used to support its weight-of-evidence demonstration. The difference in the two rates appears even less important when compared to the overall modeled emissions from all three facilities included in the BART Alternative analysis: Carbon, Hunter, and Huntington. Accordingly, we find that the SO_2 emission rates used by Utah for modeling the Carbon Power Plant were appropriate and in keeping with the procedures outlined in the BART Guidelines.

Even if the daily SO_2 emission rates between the two periods in question had not been nearly equal, we believe that in some situations it may be appropriate to use a more recent baseline period for the visibility analysis. This is true when emissions during the meteorological period no longer provide a realistic depiction of the emissions that can be anticipated from the source.

The commenter also suggests that instead of using the highest daily emission rate from either 2001-2003 or 2012-2013, that Utah should have instead used the "median maximum daily SO_2 emissions from 2001 to 2014 (2,506 lbs/hr)." Doing so would disadvantage the BART Alternative because the SO_2 emission rate (and thereby reductions and visibility benefits) associated with closure of the Carbon Power Plant would be lower. We are unware of any guidance or precedent that would have served as a basis for Utah to use a median value as described by the commenter. In addition, we note that the commenter did not suggest that a similar approach be used for NO_x emissions from the Hunter or Huntington facilities, where SCR is assumed under the BART Benchmark. Doing so would disadvantage the BART Benchmark because the NO_x emission rate (and thereby reductions and visibility benefits) associated with SCR would be lower. For example, for Hunter Unit 1 (where combustion controls were not upgraded until very recently), the highest daily NO_x emission rate from 2001-2003 was 2,388 lb/hr, while the median daily emission rate from 2001-2014 was 2,058 lb/hr.[251] If the median approach suggested by the commenter should have been used at all, it should have been used consistently across all sources and pollutants in manner that does not selectively disadvantage one control alternative over another. Therefore, we reject the commenter's assertion that Utah should have used a median SO_2 daily emission rate when modeling the visibility benefits associated with the Carbon Power Plant retirement.

[250] Refer to spreadsheet prepared by EPA titled "Carbon daily emissions.xlsx" located in the docket for a summary of daily emission rates taken form the Air Markets Program Data.
[251] Refer to spreadsheet prepared by EPA titled "Carbon daily emissions.xlsx" located in the docket for a summary of daily emission rates taken form the Air Markets Program Data.

Comment: [NPS-TC, p. 7] It is our understanding that EPA did not evaluate all of UDAQ's model inputs and results—instead, EPA accepted them at face value. NPS did evaluate UDAQ assumptions and model results to check their validity. Although NPS does not agree with the inclusion of the Carbon Plant in the UDAQ BART analysis, we included it in our evaluation.

Response: EPA evaluated all the UDAQ modeling results, and then performed additional CALPUFF modeling which we presented in the proposal and have relied on for our final action.

Comment: [NPS-TC, p. 11] Use of these abnormally high short-term emission rates biases[252] the modeling results against BART and in favor of the BART Alternative by inflating the emission rate for Carbon Units 1 and 2 prior to their shut-down as part of the BART Alternative. In effect, PacifiCorp is being "rewarded" for having short periods of unusually high emissions. EPA should consider use of more representative emission rates when accounting for emission reductions.

Response: Refer to our response regarding modeled emission rates for the BART alternative analysis elsewhere in this document.

Comment: [Conserv Orgs, p. 33] As an initial matter, Utah failed to conduct appropriate dispersion modeling to predict visibility impacts on "worst and best 20 percent of days," and instead relied solely on CALPUFF modeling that is not able to depict such impacts.[253]

Response: We do not agree that Utah failed to conduct appropriate dispersion modeling. The requirement to consider visibility impacts on the worst and best 20 percent of days applies only to the two-prong test under 40 CFR 51.308(e)(3), whereas Utah used CALPUFF modeling as part of a WOE analysis under 40 CFR 51.308(e)(2)(i)(E).

Comment: [Conserv Orgs, p. 41] The CALPUFF visibility model is designed to predict maximum visibility impacts, and its results cannot be meaningfully interpreted to estimate impacts lower on the distribution scale, including average impacts.[254] Dr. Gray explains, "the bottom part of the CALPUFF-derived distribution does not provide much useful information regarding the impacts from the modeled source(s) on the 'best' days."[255] This is because the lower end of the distribution includes days on which the visibility impact from any single source at a particular Class I area will negligible due to wind or meteorological conditions.[256] Modeled visibility impacts on these days tell us very little about the contribution of the individual source.

Response: We do not agree with the commenter that CALPUFF results cannot be meaningfully interpreted to estimate impacts lower on the distribution scale, including annual average impacts. However, as noted in our proposal, in this instance, the difference between the BART Benchmark and the BART Alternative under the annual average metric is small (0.009 dv), and

[252] These unusually high SO2 emission rates occurred in September of 2012 and July of 2014 simultaneously at both units, probably due to high sulfur coal.
[253] *See* 2016 Gray Modeling Report, at 6.
[254] Gray Modeling Report, at 5, 7-9.
[255] *Id.* at 5.
[256] *Id.*

only marginally supports a conclusion that the BART Alternative achieves greater reasonable progress . Utah did not provide results for the 20% best days using CALPUFF modeling, nor was it required to do so, as explained elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, pp. 17-18] If the margin of error for atmospheric chemistry is considered, which it must be, any modeled visibility improvements due to nitrates are miniscule. In fact, with a margin of error for atmospheric chemistry up to a factor of 10, the modeled visibility improvements for the SCR BART option over the BART Alternative in the Utah DAQ modeling are shown in Table 7.

Table 7: Apply Chemistry Margin of Error Rate to Model Results

All Results In Deciviews					
	T&D Error Results		Chemistry Error Results		
	Utah DAQ Results				
	Alternative	Add SCR	Alternative	Add SCR	Final
Capitol Reef	2.51	2.21	0.251	0.221	0.029
Arches	2.61	2.69	0.261	0.269	-0.008
Canyonlands	3.58	3.02	0.358	0.302	0.055

Applying the atmospheric chemistry margin of error to the Baseline Case and the SCR for the EPA model runs, the results are shown in Table 8. The SCR improvement is the same as the results shown by EPA in the proposal at Table 15 for Hunter Unit 1 and table 27 for Huntington Unit 1.

Table 8: Margin of Error Applied to EPA Visibility Improvements

Worst Year of Three in Deciviews Hunter Unit #1						
	EPA proposal Table 15			Include Margins of Error		
	Baseline	SCR	SCR Improvement	Base Case	SCR	SCR Improvement
Capitol Reef	4.606	3.493	1.113	2.71	2.05	0.15
Arches	4.601	3.259	1.342	2.71	1.92	0.16
Canyonlands	5.356	3.811	1.545	3.15	2.24	0.18

Table 9: Margin of Error Applied to EPA Visibility Improvements

Worst Year of Three in Deciviews							
Huntington #1							
	EPA proposal Table 27			Include Margins of Error			
	Base Case	SCR	SCR Improvement	Base Case	SCR	SCR Improvement	
Capitol Reef	3.389	2.281	1.108	1.99	1.34	0.12	
Arches	3.887	2.399	1.488	2.29	1.41	0.15	
Canyonlands	5.13	3.249	1.881	3.02	1.91	0.19	

The inclusion of the chemistry error, derived from the results in Colorado, shows that CALPUFF when corrected for the known margins of error shows no true advantage in using SCR/LNB/OFA over the Base Case. The UDAQ modeling shows that the BART Alternative is superior to SCR/LNB/OFA or at least equivalent. This is primarily because the BART Alternative reduces the sulfate impact that is much more important to visibilities in the Parks.

Response: The adjustments the commenter makes to include a "chemistry error" appear to use estimates of uncertainty in CALPUFF that adjust the metrics used in the comparison of our BART analysis to the BART Alternative. The approach is not clearly presented and no detailed methodology or calculations are included with the commenter's assertions. Regardless, for the same reasons that we disagree with the commenter's previous implied assertion that a transport and diffusion "margin of error" should be applied to the CALPUFF model results, we disagree that an atmospheric chemistry "margin of error" should also be applied to the CALPUFF model results. Refer to our response elsewhere in the document.

Comment: **[PacifiCorp -- Hoffnagle Report, pp. 19-20]** The margins of error for CALPUFF, both the transport and diffusion error and the chemistry error, have been applied to various results of CALPUFF BART modeling for the Utah Regional Haze SIP and EPA FIP. The CALPUFF results without consideration of the margin of error overstate the visibility improvements to be obtained by reductions in NO_x emissions. Improvements from 0.12 to 0.19

deciviews are visually not perceptible and well below the EPA BART threshold of 0.5 deciviews. Adding SCR to the four BART units will not lead to significant or measureable improvements in visibility in the Parks beyond that achievable with the Utah BART Alternative.

Response: The commenter appears to be arguing that EPA should approve the BART Alternative because implementation of the BART Benchmark would not result in significantly greater improvements in visibility than the BART Alternative. However, in order to approve a BART Alternative under 40 CFR 51.308(e)(2), we must be able to determine that the BART Alternative would result in *greater* reasonable progress than BART. Thus, even if the commenter were correct that the BART Benchmark would result in slightly greater improvement than the BART Alternative, this fact would not support approval of the BART Alternative. Our responses regarding the margins of error for CALPUFF and consideration of less-than-perceptible visibility improvements less are found elsewhere in this document.

Comment: [Conserv Orgs – Gray Report, p. 5] The goal of the Regional Haze Rule is to determine the differences in visibility between control strategies for each impacted Class I area for the "worst and best 20 percent of days. More sophisticated models or analysis of IMPROVE data could be used to identify the best and worst 20 percent days, but because CALPUFF does not model all sources of visibility impairment, it is not possible using the CALPUFF model results alone to determine which of the modeled daily visibility impacts occurred on the best and worst days.

Response: As explained elsewhere in this document, Utah used CALPUFF modeling as part of a WOE analysis under 40 CFR 51.308(e)(2)(i)(E), not to make a demonstration under the two-prong test in 40 CFR 51.308(e)(3). Therefore, Utah was not required to identify or consider the best and worst 20 percent days.

Comment: [Conserv Orgs – Gray Report, p. 6] The upper end of the distribution of daily CALPUFF-modeled visibility impacts provides useful information regarding the potential peak impacts from the modeled source(s), however the lower end of the distribution does not provide much meaningful information. Therefore, more emphasis (greater weight) should be placed on those metrics that describe the upper end, or "peak" part of the distribution. Some metrics are better than others at describing peak visibility impacts.

Response: Our response regarding the utility of CALPUFF across the distribution of visibility impacts is found elsewhere in this document.

Comment: [Conserv Orgs – Gray Report, p. 7] The CALPUFF model was used to predict concentrations of visibility-impairing pollutant species on an hourly basis which were then used to compute the highest daily average visibility impacts (delta dv) at each Class I area. For each year, the 365 modeled daily values at each Class I area comprise a distribution of impacts. The impacts from the modeled power plant units (under each emission scenario) can be fully described by examination (and comparisons) of the entire distribution. However it is impossible to describe an entire distribution with a single statistic (such as an average or median), especially if we are mostly interested in the upper end of the distribution, i.e., those days when peak impacts occur. The visibility metrics represent various statistical measures that describe different parts of the complete distribution of impacts. In other words, each metric illuminates a different part of the

complete distribution. However, some metrics are better than others are describing peak impacts. The ability of each visibility metric to represent peak impacts is examined below.

Response: Our responses regarding the appropriate use of modeling metrics, including the annual average impact, are found elsewhere in this document.

Comment: [NPS Tech, p. 12] NPS Modeling Results Our analyses show that: UDAQ's BART Alternative would result in less visibility improvement on the 98th percentile days than BART at seven of the eight Class I areas we modeled,[257] and that about 73% of the impairment resulting from the BART Alternative is attributed to nitrate. The cumulative total improvement across the nine Class I areas for BART relative to the BART Alternative would be more than 1.5 dv, with average improvement for BART compared to the BART Alternative of 0.17 dv. *(NPS modeling results are provided on pp.13-15 of its technical comment document)*

Response: We acknowledge the commenter's modeling efforts. We note that the average improvement of 0.17 dv for BART compared to the BART Alternative is similar to the average improved in the CALPUFF modeling performed by UDAQ. These results provide additional support for our finding that the 98th percentile metric indicates that the BART Benchmark would result in greater reasonable progress than the BART Alternative.

Comment: [Conserv Orgs, p. 20] Unlike Utah's SIP analysis, EPA's CALPUFF visibility modeling complies with EPA regulations and guidelines and is consistent with other EPA BART determinations. For example, without EPA approval, PacifiCorp installed new LNB controls at each of the BART units over the time period of 2006-2014.[258] PacifiCorp installed these new LNB controls prior to a formal BART determination, which could have unfairly influenced the BART analysis process. EPA rejected PacifiCorp's strategy and instead correctly assessed baseline emissions from the mandated 2001-2003 baseline period—prior to the installation of NO_x controls at the BART units.

Response: We disagree that Utah's CALPUFF modeling did not comply with EPA regulations and guidelines. In particular, we note that the CALPUFF modeling analyses performed by the State in support of its BART Alternative and those performed by EPA in support of its FIP for BART were intended for different purposes. The State's BART Alternative modeling was intended to compare the relative visibility benefits (towards achieving reasonable progress) between the Alternative and the BART Benchmark. As explained elsewhere in this document, in evaluating the benefits of the BART Alternative, the State was permitted to take credit for any emission reductions that occurred after 2002 and were not required for BART. Because the combustion controls (LNB/OFA) were installed on the BART units after 2002, it was acceptable for the State to model the visibility benefits for both the Alternative and the Benchmark after the installation of these controls.[259] By contrast, EPA's modeling sought to assess the visibility benefits of all feasible control options – LNB/OFA, LNB/OFA plus SNCR, and LNB/OFA plus

[257] We were unable to include Flat Tops in our analyses, so we used UDAQ's results instead—which favored the BART Alternative. (FN23 in NPS document).
[258] 81 FR 2004, 2018 (Jan. 14, 2016).
[259] While the State did not include a baseline case in its modeling, by accounting for the installation of LNB/OFA in both the Alternative and Benchmark scenarios, it effectively included these controls as part of the baseline.

SCR – relative to a common baseline. Therefore, EPA correctly chose a baseline prior to the installation of the combustion controls. In short, it was appropriate for the State and EPA to use different approaches to establishing the baselines for their modeling because the respective modeling efforts were intended to serve different purposes.

3. PM_{10} BART Determination

Comment: [UARG, p. 4] For PM_{10} BART, Utah determined that the existing fabric filter baghouses at Hunter Units 1 and 2 and Huntington Units 1 and 2 and their enforceable 0.015 lb/mmBtu emission rate limits (included in Utah's 2008 regional haze SIP) represented the most stringent technology available and the most stringent achievable emission limit. For that reason, Utah determined that a streamlined analysis of PM_{10} BART was appropriate.

Response: Comment noted. Please see our response to the PacifiCorp comment below.

Comment: [UARG, p. 4] EPA should make final its proposed approval of the Utah BART Alternative and its proposed approval of Utah's PM_{10} BART determinations.

Response: We agree with the commenter. EPA is finalizing our approval of Utah's PM_{10} BART determinations for Hunter Units 1 and 2 and Huntington Units 1 and 2 in our final rule.

Comment: [PacifiCorp, p. 59] PacifiCorp requested EPA incorporate by reference its prior December 22, 2014 comment letter addressed to the State of Utah into PacifiCorp's current March 14, 2016 comments to EPA (corrected version of the 2014 letter submitted to EPA is undated). These prior comments include the overarching comment that the PM BART determinations consist of the most stringent controls and limits available. PacifiCorp provided the following additional supporting information:

In its Guidelines for BART Determinations Under the Regional Haze Rule found at 40 CFR §51, Appendix Y ("BART Guidelines"), EPA states in part at Section IV.D.9: "If you find that a BART source has controls already in place which are the most stringent controls available…, then it is not necessary to comprehensively complete each step of the BART analysis in this section. As long as these most stringent controls available are made federally enforceable for the purpose of implementing BART for that source, you may skip the remaining analyses in this section…."

In the prior Utah RH SIP, Utah's PM BART determination required the Units to install fabric-filter baghouses as PM BART and meet a PM emission limit of 0.015 lb/MMBtu. In its final rule partially approving and partially disapproving the prior Utah RH SIP, EPA disapproved the PM BART determination for the Units because "the State has not provided a demonstration that the PM BART emission limits at the Utah BART sources represent the most stringent controls." 77 Fed. Reg. 74,355, 74,367 (December 14, 2012). The SIP Revision reiterates and concludes, based on Utah's review and approval of PacifiCorp's PM BART analyses, that the "baghouse technology required…is still the most stringent technology available and 0.015 lb PM/MMBtu represents the most stringent emission limit." (Staff Review, p. 5). In addition, by including the emission limits in amended Section IX.H.21 and 22, the SIP Revision makes the PM BART

limits federally enforceable. As a result, Utah properly skipped the remaining BART analyses steps consistent with the BART Guidelines and properly determined PM BART for the Units.

Utah's conclusion is further supported by SIP approvals offered by EPA in surrounding states, which PacifiCorp requests that Utah specifically rely on in making its final decision to approve the proposed PM BART determinations for the Units.

a. In Colorado, with regard to similar electric generating units (EGU), EPA explained that "[f]abric filter baghouses are the most stringent control technology for controlling PM emissions." 77 Fed. Reg. 18,052, 18,066 (Mar. 26, 2012). EPA further explained, "consistent with the BART Guidelines, the State did not provide a full five-factor analysis because the State determined BART to be the most stringent control technology and limit" and "assumes the BART limit can be met with the operation of the existing fabric filter baghouses." *Id.* Significantly, EPA concluded that it "agree[d] with the State's conclusions and we are proposing to approve its PM BART determinations." *Id.*

b. In Wyoming, EPA approved the State's conclusions that "fabric filters represent the most stringent PM control technology" and that "[c]onsistent with the BART Guidelines, the State did not provide a five-factor analysis because the State determined BART to be the most stringent control technology and limit." 77 Fed. Reg. 33,022, 33,035. (*citing* 70 Fed. Reg. at 39,165 (Appx. Y)). EPA also has approved or proposed to approve in numerous other actions, including Wyoming, the same 0.015 lb/MMBtu PM BART emissions limit adopted in the prior Utah RH SIP and in this SIP Revision. *See, e.g.*, 79 Fed. Reg. 5,032, 5,220. *See also* EPA's approval of PM BART in Arizona (77 Fed. Reg. at 72,523 (December 5, 2012)) and for the Four Corners Power Plant (77 Fed. Reg. 51, 620, 51, 636 (August 24, 2012)).

c. In other actions, EPA has approved PM BART limits that are twice as high as those included for the Units in the SIP Revision. For example, EPA approved a RH SIP with a PM BART emissions limit of 0.03 lb/MMBtu for nine EGUs in Colorado. *See, e.g.*, 77 Fed. Reg. 18,051,18,066 (Mar. 26, 2012); 77 Fed. Reg. at 76,872 . EPA approved PM BART emissions limits of 0.03 and 0.04 lb/MMBtu for certain EGUs in Wyoming, where the most stringent limit was 0.015 lb/MMBtu. 79 Fed. Reg. at 5,220. EPA also approved PM limits of 0.07 lb/MMBtu for four EGUs in North Dakota. 76 Fed. Reg. at 58,585; 77 Fed. Reg. at 20,930. In addition, EPA also adopted a PM limit of 0.26 lb/MMBtu for Corette in its FIP for Montana. 77 Fed. Reg. at 57,911.

Response: We agree with the commenter. The additional information Utah provided in the SIP and the information provided by the commenter comparing the PM_{10} BART determinations and emission limits to those EPA has approved in other states is adequate to support the State's assertion that the fabric filters represent the most stringent PM controls available, and that 0.015 lb/MMBtu (30-day rolling average) represents an appropriate PM_{10} emission limit for the fabric filters. As the fabric filters represent the most stringent PM controls available, and the state has submitted corresponding emission limits that will be made federally enforceable by our approval, under the BART Guidelines the State need not comprehensively complete every step of a full BART analysis. EPA is therefore finalizing our approval of Utah's streamlined PM_{10} BART

determinations and corresponding emission limits for Hunter Units 1 and 2 and Huntington Units 1 and 2 in our final rule.

Comment: [UARG, p. 13] EPA's proposed SIP approval action properly includes a proposal to approve Utah's PM_{10} BART determinations. As the Proposed Rule states, the fabric filter baghouse emission control technology in use at Hunter Units 1 and 2 and Huntington Units 1 and 2 is "the most stringent technology available" for PM_{10} and the existing PM_{10} emission limit of 0.015 lb/mmBtu at these units "represents the most stringent emission limit for PM_{10}." *Id.* Accordingly, Utah has satisfied any PM_{10} BART requirements for these units.

Response: We agree with the commenter. Please see our response to the PacifiCorp comment above. EPA is finalizing our approval of Utah's PM_{10} BART determinations for Hunter Units 1 and 2 and Huntington Units 1 and 2 in our final rule.

Comment: [Conserv Orgs -- Stamper Report, p. 63]
Utah has adopted PM_{10} limits of 0.015 lb/MMBtu as PM_{10} BART for those EGUs that committed to install baghouses. 81 Fed.Reg. 2026 (Jan. 14, 2016). However, lower PM_{10} limits are achievable with baghouses. PM_{10} limits of 0.010 lb/MMBtu should be achievable with baghouses.

There have been several recent permits issued with BACT limits at 0.010 lb/MMBtu based on installation of a fabric filter baghouse, including the Desert Rock permit issued by EPA Region IX.[260] The Plant Washington Permit also set a BACT limit of 0.010 lb/MMBtu based on a baghouse.[261]

Even these lower emission limits do not reflect the low levels of filterable PM emissions can be achieved with fabric filter baghouses. Source test data have shown that lower emission levels can be achieved. At least 147 performance tests at coal-fired plants in Florida, as early as May 2004, measured filterable PM/PM_{10} at less than 0.010 lb/MMBtu and 82 recorded PM/PM_{10} emissions less than 0.005 lb/MMBtu.[262] The lowest reported PM/PM_{10} emission rate was 0.0004 lb/MMBtu.

Further, Matt Haber, EPA Region 9's BACT expert and current Deputy Director of the Air Division, concluded back in 2002 that BACT for filterable PM at two existing PC boilers firing Powder River Basin coal and equipped with a baghouse was 0.006 lb/MMBtu based on a 3-hour average and monitored via EPA Method 5 and continuously using triboelectric broken bag detectors.[263] In evaluating the achievable emission rates with a new baghouses at these units, there is no reason that baghouse retrofit applications could not achieve similar PM emission rates as new units with a baghouse.

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[260] Desert Rock PSD Permit (Ex. 58).
[261] Plant Washington PSD Permit (Ex. 59).
[262] Florida Source Tests Compilation (Ex. 60).
[263] Matt Haber, *Best Available Control Technologies for the Baldwin Generating Station, Baldwin, Illinois, Expert Report*, Prepared for the United States in connection with U.S. v. Illinois Power Company and Dynegy Midwest Generation, Inc., April 2002, p. 3 (Ex. 61).

Other states and EPA regions have made low PM BART determinations as well. For example, U.S. EPA Region 9 adopted BART filterable particulate limits for the Four Corners power plant, Navajo Nation at Units 1-3 of 0.012 lb/MMBtu for each unit and at Units 4 and 5, 0.015 lb/MMBtu.[264] South Dakota adopted and EPA approved as BART for the Big Stone power plant a PM limit of 0.012 lb/MMBtu, applicable at all times including startup, shutdown, and malfunction.[265]

In summary, Utah's proposed PM_{10} BART emission limits should be lower than 0.015 lb/MMBtu to ensure that the BART limitations reflect the degree of emission limitation achievable with baghouses at Hunter Units 1 and 2 and at Huntington Units 1 and 2.

Response: EPA disagrees that the PM BART limit must be lower than 0.015 lb/MMBtu. A partial response to this comment is provided in the FRN.

EPA agrees that in general baghouses have very high PM control efficiency capabilities. However, we do not agree with all the points of comparison that the commenter provides. For example, the 0.010 lb/MMBtu PM limit in the Desert Rock permit cannot be directly compared with the 0.015 lb/MMBtu PM limit here, as the Desert Rock permit limits in lb/MMBtu do not apply during periods of startup and shutdown, while the 0.015 lb/MMBtu limits here do apply at all times. See Desert Rock Permit, Ex. 58, IX.N.3; Utah SIP H.21.e. With respect to the cited report for Baldwin Generating Station, we note that the consent decree entered into by the United States, Illinois Power Company, and Dynegy Midwest Generation with respect to Baldwin Generating Station, Units 1, 2, and 3, contains a 0.015 lb/MMBtu PM_{10} limit, based on installation of fabric filters and an annual stack test. Consent Decree, Civ. No. 99-833-MJR, Sections VI.B.85, VI.D.1. Thus, this example supports our approval of Utah's PM_{10} BART emission limit. Finally, the cited Florida performance tests show a range of results up to 0.017 lb/MMBtu, and in any case the performance tests were likely not performed during periods of startup or shutdown.

While there may remain instances in which a lower limit has been imposed in a PSD permit or approved in a regional haze action, on the other hand, as cited in the PacifiCorp comment above, other EPA regional haze actions have approved a PM BART limit of 0.015 lb/MMBtu. In addition, we note that the latest revision to the EGU New Source Performance Standards (NSPS) requires modified units to meet a PM limit of 0.015 lb/MMBtu.[266] Also, the EGU MATS rule sets a PM emissions standard of 0.03 lb/MMBtu, and the BART Guidelines provide that, "unless there are new technologies subsequent to the Maximum Achievable Control Technology (MACT) standards which would lead to cost-effective increases in the level of control, you may rely on the MACT standards for purposes of BART."[267] While the U.S. Supreme Court reversed the judgment of the D.C. Circuit Court of Appeals affirming the MATS rule, the Supreme Court did so on the basis that EPA had not considered costs in EPA's determination that regulation of

[264] Source Specific Federal Implementation Plan for Adopting Best Available Retrofit Technology for Four Corners Power Plant: Navajo Nation, 75 FR 64221 (Oct. 19, 2010).
[265] Approval and Promulgation of Implementation Plans: South Dakota: Regional Haze Implementation Plan, 76 FR 76646, 76659 (Dec. 8, 2011); 77 FR 24845.
[266] 77 FR 9450 (Feb. 16, 2012) (codified at 40 CFR 60.42Da).
[267] 40 CFR Part 51, Appendix Y, Section IV.C.

EGUs under section 112 was "appropriate and necessary," see CAA section 112(n)(1)(A), and not on the basis that EPA had impermissibly determined the level for the MACT standards. *Michigan v. EPA*, 135 S. Ct. 2699 (2015).
Finally, due to the low contribution of coarse mass direct particulate emissions from point sources such as Hunter Units 1 and 2 and Huntington Units 1 and 2 to visibility impairment, lowering the emission limit to 0.010lb/MMBtu is unlikely to result in any meaningful visibility improvement.

Thus, we agree with Utah that the submitted PM emission limit adopted for these sources in Section IX, Part H.22 of Utah's SIP satisfies BART for these units. We are finalizing our approval of Utah's PM_{10} BART determination at Hunter Units 1 and 2 and Huntington Units 1 and 2. We find that an emission limit of 0.015 lb/MMBtu reasonably represents what can be continuously achieved with a properly operated baghouse on these units. Therefore, we are finalizing our proposed approval of Utah's BART determination for PM_{10} at Hunter Units 1 and 2 and Huntington Units 1 and 2.

4. EPA's FIP

a. Overarching Comments on FIP

Comment: [PacifiCorp, p. 1] PacifiCorp strongly opposes EPA's proposed federal implementation plan, which would result in hundreds of millions of dollars in costs with less "reasonable progress" than the BART Alternative.

Response: Comment noted. Please refer to the final rule for our summary of the visibility impacts from the Utah BART sources, as well as the visibility improvements anticipated from our FIP action.

Comment: [Conserv Orgs, p. 2] Accordingly, BART-based NO_x emissions reductions from Hunter Units 1 and 2 and Huntington Units 1 and 2 are justified to clean the air over Utah's spectacular national parks and are legally required. The Conservation Organizations therefore urge EPA to promulgate its proposed federal implementation plan ("FIP") for Utah.[268]

Response: We concur and are promulgating a FIP in today's final action.

[268] A coalition of conservation groups submitted comment letters to the State of Utah on March 8, 2011, December 22, 2014, May 1, 2015, and September 14, 2015 regarding its adoption of the State Implementation Plan (SIP), which are attached and incorporated herein by reference. Copies of these comment letters are attached hereto as Exhibits ("Ex.") 1-4 and are incorporated herein by reference. A coalition of conservation groups also submitted a comment letter to U.S. Environmental Protection Agency on July 16, 2012, which is also attached and incorporated herein by reference. A copy of this letter is attached hereto as Exhibit 5. In addition, the National Park Service (NPS) previously submitted a series of comment letters to Utah on its regional haze SIP, which are attached hereto and incorporated herein by reference. *See* National Park Service ("NPS") letter to the State of Utah dated August 1, 2008 attached hereto as Ex. 6; NPS letter to the State of Utah dated March 4, 2011 attached hereto as Ex. 7; and, NPS letter to EPA dated July 13, 2012 attached hereto as Ex. 8. We also incorporate herein by reference the NPS comments to EPA on this proposed rule and all attachments thereto.

b. BART-Eligible Sources

c. Methodology (Comparison with other BART Determinations)

Comment: [PacifiCorp, pp. 5, 27, 28] EPA's proposed BART analysis for each Unit is flawed, making the FIP Proposal legally unsustainable.

Not only did EPA improperly reject the Utah SIP Proposal for the reasons described above, it also failed to correctly analyze the five statutory BART factors under its FIP Proposal when it created its NO_x BART determinations for the Utah BART Units (Hunter Units 1 and 2, and Huntington Units 1 and 2).

EPA, however, failed to properly consider and analyze four of the five BART factors in its FIP Proposal: (i) existing NO_x controls; (ii) costs of compliance; (iii) non-air quality environmental and energy impacts; and (iv) reasonably anticipated visibility improvement.

Response: We disagree that we improperly rejected the Utah SIP proposal. See our discussion on this topic elsewhere in this document.

We also disagree that we failed to properly analyze any of the five BART factors in our FIP proposal. We address the commenter's specific claims in regard to each of these factors in separate responses in this section of the document.

Comment: [Conserv Orgs, p. 22] EPA's visibility modeling results also compares favorably to other EPA BART determinations where SCR was required on coal plants in the Interior West. In summary, we agree with EPA that installing SCR at Hunter and Huntington compares well with, is consistent with, and often exceeds, visibility improvements at other plants in the Interior West.

Response: We concur. Refer to our discussion in the FRN and elsewhere in this document on how the costs of compliance and visibility improvements for the installation of SCR at the four Utah BART EGUs compares to where it has been required at other units.

Comment: [NPS Tech, p. 6] EPA proposed that the cost of adding SCR at Hunter Units 1 and 2 and Huntington Units 1 and 2 are reasonable when compared to the cost of adding SCR at the Cholla, Hayden, and Laramie River power plants where SCR had been determined to represent BART. We are also pleased that EPA considered the impacts on visibility from the entire BART-eligible source and at multiple Class I areas in its analyses of visibility benefits and in its BART proposals.

Response: Comment noted. As explained in the preamble to our final rule, the visibility benefits from application of BART to the entire BART source and the visibility benefits from BART at the nine impacted Class I areas support our selection of SCR + LNB/SOFA as BART.

d. Cost of Controls

Comments Regarding EPA Costs

Comment: [NPS Tech, pp. 5-6] EPA proposed that the costs of adding SCR to Hunter Units 1 and 2 and Huntington Units 1 and 2 compare favorably with the costs of adding SCR at Hayden Station Units 1 and 2 which Colorado determined to represent BART. It appears that the costs to install SCR at the Hayden Station were based upon 2006 dollars while the costs to install SCR at Hunter and Huntington were based upon 2014 dollars. A comparison of the Chemical Engineering Plant Cost Index (CEPCI) values for these two years shows that the 2014 costs are 15% higher than the same 2006 costs, due to inflation. A more accurate comparison would be obtained by increasing the Hayden costs to reflect 2014 dollars; as a result, the comparison to SCR costs at Hunter and Huntington would be even more favorable there. Likewise, it appears that the costs to install SCR at the Cholla Power Plant, for which EPA determined that BART was SCR in its Arizona FIP, were based upon 2009 dollars while the costs to install SCR at Hunter and Huntington were based upon 2014 dollars. A comparison of the CEPCI values for these two years shows that the 2014 costs are 10% higher than the 2009 costs, due to inflation. A more accurate comparison would be obtained by increasing the Cholla costs to reflect 2014 dollars; as a result, the comparison to SCR costs at Hunter and Huntington would be even more favorable there. EPA should also have adjusted the costs it cited for SCR at the Laramie River Station (determined to represent BART in its Wyoming FIP) to reflect the 2% increase in costs since the 2013 cost year used there. Once again, the comparison to SCR costs at Hunter and Huntington would be even more favorable there. We suggest that EPA also consider the determination made by Wyoming that SCR should be added to all four units at the Jim Bridger power plant where the 2013 dollar cost-effectiveness values estimated by EPA also exceed EPA's 2014 dollar cost estimates for Hunter and Huntington

Response: We concur that, when comparing cost effectiveness of control options at a single BART source, it is best to use values adjusted to the same year (e.g., 2014 dollars). However, for the purposes of comparison with other BART determinations, cost effectiveness cannot be reliably adjusted from year-to-year by using the CEPCI as suggested by the commenter. This is because cost effectiveness is derived from total annual costs that are in turn the sum of the annualized capital costs and the operation and maintenance costs, but the CEPCI is only used to adjust the former. Moreover, some operation and maintenance costs do not change in proportion to the CEPCI, and may even decrease over time (while the CEPCI has largely increased over time). For example, catalyst replacement costs, which make up a large portion of the operation and maintenance costs, have decreased over time.[269] Nonetheless, because total annual costs of SCR are dominated by the annualized capital costs, and those costs have increased over time, we agree that as a general matter, if the SCR cost effectiveness for the other BART EGUs was adjusted to 2014 dollars, it would compare even more favorably to those from Hunter and Huntington. Regardless, adjusting the cost effectiveness for these units to 2014 would not alter our selection of SCR with combustion controls as BART because the cost effectiveness of SCR compares favorably either way (when the other BART factors are taken into consideration). As we explain elsewhere in response to comments, for purposes of our comparison of BART at the Hunter and Huntington BART units with other BART determinations, it is not necessary that the cost-effectiveness and visibility impacts be computed in precisely the same way for all the BART determinations.

[269] CURRENT CAPITAL COST AND COST-EFFECTIVENESS OF POW ER PLANT EMISSIONS CONTROL TECHNOLOGIES, Prepared for Utility Air Regulatory G roup, p. 6-5, J. Edward Cichanowicz, July 201.

Comment: [NPS-TC, p. 5] …the draft revised CCM [EPA Control Cost Manual] for SCR now assumes a 30-year equipment life instead of the 20-year life cited in the current CCM and used by EPA in its Utah analyses;[270] the effect of the shorter amortization period used by EPA is to increase annual costs by 13% (when applied to the ATP estimates). Thus, EPA has overestimated the costs of SCR (which it nevertheless considers reasonable).

Response: The revised CCM chapter for SCR was not finalized until May of 2016, shortly before EPA took final action on Utah's SIP.[271] Because the revisions to the CCM for SCR were not finalized until very recently, it was appropriate for EPA to assume an equipment life of 20 years consistent with the 2002 CCM in our proposed rule. In addition, this allowed us to make direct comparisons with several other recent BART analyses for SCR where an equipment life of 20 years was assumed (e.g., our final RH rules for Wyoming, Montana, Arizona, etc.). Nonetheless, in our revised costs supporting this final rule, we have presented costs for the Utah BART EGUs based on an assumed equipment life of both 20 and 30 years.[272] Whether 20 or 30 years is assumed does not alter our selection of SCR (with combustion controls) as BART because in both cases the cost effectiveness is very reasonable when considered along with the other BART factors.

Moreover, because cost effectiveness is judged in relation to that at other sources, it matters very little whether 20 or 30 years is used so long as a consistent assumption is made. For example, consider our comparison of cost effectiveness (and visibility improvement) in the final rule where the cost effectiveness of SCR for Hunter 1 is compared to that of other sources where it has been evaluated. In that case, the cost effectiveness values are consistently based on an assumed equipment life of 20 years. If by contrast, all of the cost effectiveness values had been based on an assumed equipment life of 30 years, then the cost effectiveness values would all decrease in like fashion such that the relative comparison would remain unchanged. While slight variations in methodology do not matter much for comparisons, as the commenter states, the change to a 30-year life is more significant. Thus, comparing cost effectiveness values for SCR based on 20 years to those based on 30 years would be somewhat problematic. In any case, for the reasons above, the equipment life of SCR is not pivotal when selecting BART for the Utah EGUs.

Comment: [NPS-TC, p. 6] EPA proposed that the cost of adding SCR at Hunter Units 1 and 2 and Huntington Units 1 and 2 are reasonable when compared to the cost of adding SCR at the Cholla, Hayden, and Laramie River power plants where SCR had been determined to represent BART. We are also pleased that EPA considered the impacts on visibility from the entire BART-eligible source and at multiple Class I areas in its analyses of visibility benefits and in its BART proposals.

Response: Comment noted. In addition, in the final rule we have updated our comparison of SCR BART determinations. Also, see related responses elsewhere in this document.

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[270] Revised CCM, page 2-69, "…broadly speaking, a representative value of the equipment life for SCR at power plants can be considered as 30 years."
[271] https://www3.epa.gov/ttn/ecas/docs/SCRCostManualchapter7thEdition_2016.pdf
[272] Cost of NO_x BART Controls on Utah EGUs from Andover Technology Partners, to EC/R, Inc., May 13, 2016 (ATP report). Andover Technology Partners is a subcontractor to EC/R Incorporated.

Comment: [UDAQ-HT, p. 21] Because UT has already implemented controls under the first option in EPA's proposal, imposing a FIP under the second option would effectively require all controls from both options. The cost effectiveness of the option to partially disapprove the UT SIP and impose a FIP should be evaluated based on the cost to implement all controls and from the beginning to the end of the current planning period. (Rocky Mountain Power and Savage made similar comments.)

Response: We disagree with this comment. As explained in the FRN and elsewhere in this RTC document, we were unable to find that the BART Alternative contained in the State's SIP submittal would make greater reasonable progress than BART. Thus, we are required to disapprove the BART Alternative and promulgate a FIP to satisfy our existing CAA obligations.

In making our BART determination we evaluated all feasible controls that are intended to fulfill the requirements of §51.308(e)(1) for BART: LNB/SOFA (already installed), LNB/SOFA and SNCR, and LNB/SOFA plus SCR. That evaluation of controls included the costs of compliance, as measured by cost effectiveness. In each case, we estimated emission reductions for cost effectiveness purposes relative to a 2001-2003 baseline. Therefore, in promulgating the FIP, EPA has met the requirements of the RHR in regard to assessing the costs of compliance for BART sources.

Comment: [UDAQ, p. 23] The assumed 20-year life to the Hunter and Huntington units is incorrect. In its modeling, EPA claims that PacifiCorp assumes a 20-year life on the Hunter and Huntington units. In Utah's conversations with PacifiCorp, the timeline would be different with the imposition of a FIP requiring SCR because this control would be installed in addition to controls already required and installed as part of the BART alternative. Consultation with PacifiCorp should be used to determine a more realistic time frame.

Response: We disagree that the remaining useful life of at least 20 years that we assumed in our proposed rule for the Hunter and Huntington BART units was incorrect. In our proposed rule for Utah, we explicitly solicited information that would lead the Agency to consider other BART control options that that could be finalized in a FIP (if we were to disapprove the Utah BART alternative), as well as information or comments on the proposed timing of compliance (81 FR 2007). However, PacifiCorp did not offer any information responsive to this request (e.g., an indication that they would prefer to retire any of their BART EGUs in Utah early as opposed to installing SCR). By contrast, during the public comment period for our Regional Haze rulemaking for Wyoming, PacifiCorp indicated that they would prefer to retire Dave Johnston Unit 3 early as opposed to installing SCR (79 FR 5049, 5165). In that instance, because the shorter remaining useful of the unit (9 years) would have constrained the equipment life of SCR, the cost effectiveness of SCR became prohibitive when taken into consideration with the remaining statutory BART factors. For this reason, in our FIP for Wyoming, PacifiCorp was given the option of either retiring the unit within 9 years or installing SCR. But again, PacifiCorp has not proposed a similar approach here despite EPA having explicitly solicited such proposals. As explained in the BART Guidelines:

> The "remaining useful life" of a source, if it represents a relatively short time period, may affect the annualized costs of retrofit controls. For example, the methods for calculating annualized costs in EPA's *OAQPS Control Cost Manual* require the use of a specified time period for amortization that varies based upon the type of control. If the remaining useful life will clearly exceed this time period, the remaining useful life has essentially no effect on control costs and on the BART determination process. Where the remaining useful life is less than the time period for amortizing costs, you should use this shorter time period in your cost calculations.
> For purposes of these guidelines, the remaining useful life is the difference between:
> (1) The date that controls will be put in place (capital and other construction costs incurred before controls are put in place can be rolled into the first year, as suggested in EPA's *OAQPS Control Cost Manual*); you are conducting the BART analysis; and
> (2) The date the facility permanently stops operations. Where this affects the BART determination, this date should be assured by a federally- or State-enforceable restriction preventing further operation.

40 CFR part 51, Appendix Y, IV.D.4.k. In this case, there is no enforceable restriction preventing further operation of the Hunter and Huntington BART units. Thus, even assuming that the fact that the LNB/SOFA were installed earlier than the SCR will be at the units is relevant here, in the absence of an enforceable restriction we can assume that the remaining useful life of the Hunter and Huntington units will be at least 20 years, no matter whether the installation date of the LNB/SOFA or the SCR is used as the starting point.

Comment: [NPS-TC, p. 1] EPA cost estimates show that both the combined cost of Low-NO_x Burners and Overfired Air plus Selective Catalytic Reduction (LNB/OFA + SCR) and the incremental cost of adding SCR to LNB/OFA are cost-effective and represent BART.

Response: We concur. In addition, the revised cost effectiveness estimates that we prepared to support this final rule, when considered along with the other BART factors, continue to support selection of SCR with LNB/OFA as BART.

Comment: [UPHE, p. 11] The age of Rocky Mountain Power's BART eligible plants in central Utah averages 40 years. As discussed above, this is late middle age for a typical coal-fired generating unit. The economically useful life of these units is already on the downhill slope for these units. As will be discussed later, spending an additional $1.5 billion to operate these plants with BART NO_x controls is probably cost effective when the public health benefits of reduced NO_x and its secondary pollutants (ozone, and fine particulates) are considered, but that additional expense should be compared to the expense of building utility-scale renewable generating facilities of a capacity comparable to the retired Carbon complex.

Response: We disagree that we should have compared the expense of installing and operating BART NO_x controls to the expense of building utility-scale renewable generating facilities of a capacity comparable to the retired Carbon complex. The RHR and BART Guidelines only require that the costs of compliance for technically feasible control options at the BART source be evaluated, and not that these costs be compared to that to build new generation capacity. For

purposes of our FIP BART determination for the Hunter and Huntington BART units, cost of replacement generation for the Carbon shutdown appears to be irrelevant.

Comments Regarding PacifiCorp's Costs

Comment: [Conserv Orgs -- Stamper Report, p. 8] PacifiCorp greatly overstated the costs of SCR plus LNB/OFA in its BART update – both the capital costs and the operations and maintenance cost. Some of the key areas in which PacifiCorp's SCR cost analyses are overstated are detailed below:

PacifiCorp Improperly Calculated the Indirect Capital Costs for SCR Installation, Which Resulted in an Overstatement of Indirect Capital Costs and Total Capital Costs of SCR.
EPA's Control Cost Manual requires a calculation of the total capital investment to include both direct and indirect costs of purchasing and installing an SCR. "Indirect installation costs are those associated with installing and erecting the control system equipment but do not contribute directly to the physical capital of the installation."[273]

In its August 2014 BART Update, PacifiCorp relied on the calculations of direct capital costs of SCR provided in its June 2012 BART submittals plus the capital costs of low NO_x burners/overfire air, and then added to these direct capital costs the percent increases recommended by EPA's Control Cost Manual for the indirect installation costs, project contingency, and preproduction costs. Specifically, the EPA's Control Cost Manual indicates the indirect installation costs of SCR should be based on 20% of the total direct capital costs of the SCR and the project contingency costs should be based on 15% of the total direct capital costs of the SCR plus the indirect installation costs.[274] Further, the preproduction costs are based on 2% of the sum of the direct capital cost of the SCR and indirect installation costs and contingency costs.[275] However, PacifiCorp did not multiply these percentages by the direct capital costs for installation of SCR, as required by the Cost Control Manual. Instead, PacifiCorp added in the direct capital cost of the LNB/OFA controls which were approximately $11.6 million for Hunter Unit 1 and $8.3 to 8.9 million each for Hunter Unit 2, Huntington Unit 1, and Huntington Unit 2, and then applied the percentages for indirect installation, project contingency, and preproduction costs to this higher capital estimate.[276]
This resulted in an overstatement of indirect capital costs of SCR and also of total capital costs of SCR.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment

[273] U.S. EPA, Control Cost Manual, Section 4.2, Chapter 2, at 2-43. (FN22 in document).
[274] *See id.* Section 4.2, Chapter 2, at 2-44 (Table 2.5). (FN23 in document).
[275] *Id.* (FN24 in document).
[276] *See* PacifiCorp's August 5, 2014 BART Update submittal at 2-5 for LNB/OFA capital costs and at Appendix A, page 4 of each unit-specific worksheet regarding the inclusion of the capital costs of LNB/OFA in the direct capital costs of SCR. (FN25 in document).

could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 9]

PacifiCorp Improperly Includes Sales Tax in the Direct Capital Costs of SCR.

PacifiCorp included sales tax in its calculation of direct capital costs for SCR. The documentation for PacifiCorp's calculation of direct capital costs is in its June 2012 BART submittals for each of the four BART-subject units, as explained in Appendix B of PacifiCorp's August 2014 BART update. There are various places in the documentation for direct capital costs of SCR where PacifiCorp added in sales tax.26 Utah state law exempts pollution controls from sales tax.[277] So sales tax should not have been included in the capital costs of SCR.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 9]

PacifiCorp Appears to Have Improperly Included Owner's Costs in the Total Capital Investment Calculations for SCR plus LNB/OFA.

PacifiCorp's August 2014 BART Update states that, with respect to Owner's Costs, PacifiCorp "applied the Engineering and Home Office Fees in Row 87 [of the cost worksheets] in recognition of EPA's argument that real-world Owner's Costs are not allowed by the manual's methodology."[278] PacifiCorp goes on to state: "Although the manual's approach to Engineering and Home Office Fees as a representation of Owner's Cost does not reflect real world costs, it has been utilized as a proxy for purposes of this information submittal."[279] Essentially, it appears what PacifiCorp has stated is that, while it does not agree that the Control Cost Manual's approach to owner's costs addresses all owner's costs, it has only included the owner's costs allowable by the Control Cost Manual in the indirect installation costs for Engineering and Home Office Fees. The Control Cost Manual addresses Owner's costs in the indirect installation costs for engineering and home office fees by adding 10% to the capital cost of SCR.[280] Thus,

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[277] *See,* e.g., June 2012 BART submittal for Hunter 1, Appendix A-5, Exhibit 1 Sheet 4 at 1 (Sales Tax related to Common Facilities for SCR added into Other Direct and Indirect Costs in an amount of $441,700), and at 2 (Sales Tax related to Other Direct and Construction Indirect Costs Related to EPA-SCR Build in the amount of $2,119,300).

[278] *See* PacifiCorp's August 5, 2014 BART Update submittal at 1.

[279] *Id.*

[280] EPA Control Cost Manual at 2-44.

PacifiCorp determined the Indirect Installation Costs due to Engineering and Home Office Fees as 10% of the Direct Capital Costs in Row 80 of each unit's cost worksheet in Appendix A of its August 2014 BART Update.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 10] Yet, PacifiCorp's Capital Costs of Row 80 also included owner's costs. Specifically, the Row 80 Capital Costs of SCR include Contractor/Construction Management/Field Engineering, Contractor Startup/Spare Parts, and Contractor Training Classes.[281] These are indirect installation costs that are either already covered under the indirect installation costs for Engineering and Home Office Fees or are not allowed by the Control Cost Manual. So, either PacifiCorp has double-counted some owner's costs by including the costs in the direct capital costs *and* calculating indirect installation costs as 10% of the capital costs,[282] or PacifiCorp has included owner's costs that are not allowed by the Control Cost Manual. Further, the inclusion of these indirect installation Owner's Costs in the capital costs of SCR is inconsistent with PacifiCorp's apparent statement that it was only accounting for owner's costs in the indirect installation costs for Engineering and Home Office Fees as allowed by the Control Cost Manual.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 10]

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[281] *See* PacifiCorp's August 5, 2014 BART Update, Appendix B-Row 80 Direct Capital Costs – EPA Cost Effectiveness Comparison Spreadsheets.

[282] Further, because the indirect installation costs for Engineering and Home Office Fees is based on a percentage of the direct capital cost of SCR, PacifiCorp also overstated the indirect installation costs by also including some of these costs in the Row 80 direct capital costs of SCR.

PacifiCorp Did Not Justify Its Assumption that Two SCR Reactors Would Be Necessary for Each Unit.

PacifiCorp assumed 2 SCR reactors would be necessary for each unit at Hunter and Huntington.33 EPA's Control Cost Manual states that generally only 1 SCR reactor per unit is required in a typical high dust system design. EPA's Control Cost Manual states that 2 SCR reactors may be needed to treat flue gas from a boiler configuration that splits the flue gas to two air preheaters or particulate control devices.[283] PacifiCorp did not explain its justification for assuming 2 SCR reactors would be necessary at each BART-subject unit. Because the addition of SCR reactors increase capital costs,[284] UDAQ must verify that the assumption that two SCR reactors are needed at all four BART- subject units is correct.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 10]

PacifiCorp Did Not Evaluate the Costs of SCR if Anhydrous Ammonia is Used as the Reagent.

The SCR cost example in EPA's Control Cost Manual, which PacifiCorp purports to follow in its August 2014 BART Update, assumes the reagent for the SCR is anhydrous ammonia.[285] Instead, PacifiCorp assumed urea would be the reagent. Using urea as the reagent means the capital costs will be higher because of the costs of the equipment necessary to convert urea to ammonia.[286] A study of the optimal ammonia sources for SCR installations found that a urea-to-ammonia system had the highest capital costs and that anhydrous ammonia had the lowest life cycle costs.[287] UDAQ should require PacifiCorp to evaluate both use of anhydrous ammonia and use of an urea-to-ammonia system in its SCR cost analysis.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably

[283] *See* U.S. EPA, Control Cost Manual, Chapter 2, at 2-29, 2-34.
[284] *Id.* at 2-29.
[285] *Id.* at 2-41.
[286] *See* Reda Salib and Robert Keeth, Optimization of Ammonia Source for SCR Applications, Ex. 1.
[287] *Id.*

cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 11]

PacifiCorp's Costs for Urea Assumed in its SCR Cost Analyses Are Much Higher than Used by EPA in Recent BART Analyses.

PacifiCorp used a reagent cost for urea of $0.33 per pound in its SCR cost analysis.[288] PacifiCorp used a lower urea cost in its June 2012 BART analyses of $400/ton or $0.20/pound.[289] In its SCR cost effectiveness analyses for Wyoming power plants, EPA used a cost of urea of $450/ton or $0.23/pound.[290] Thus, PacifiCorp's 2014 SCR costs for urea are greatly overstated. It must be noted that the Control Cost Manual requires cost effectiveness analyses be based on the controls as of today, without taking into account any potential increases in costs in the future.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 11]

PacifiCorp Costs for the SCR Catalyst Are Also Much Higher than Used by EPA in Recent SCR BART Cost Analysis.

PacifiCorp used a catalyst cost of $240 per cubic foot for the initial catalyst and $290 per cubic foot for the replacement catalyst. This equates to $8,476 per cubic meter for the initial catalyst and $10,241 per cubic meter for the replacement catalyst. These catalyst costs are much higher than catalyst costs cited in current literature and used by EPA in recent SCR cost effectiveness evaluations. A January 2010 study on the current costs of power plant emission control technologies says the cost of catalyst is in the range of $4,000 to $6,000 per cubic meter:

> The minimum price of near $4,000/m3 first occurred in 2005, and prices approximating this level continue today. Limited catalyst availability, requiring orders to be place almost one year in advance, was observed in recent years as many operators prepared seasonal SCR reactor for annual operation, which included supplementing or replacing existing

[288] *See* PacifiCorp's August 2012 BART Update, Appendix A at page 2 of the cost spreadsheet for each unit.
[289] *See,* e.g., June 2012 BART submittal for Hunter 1, Appendix A-5, Exhibit 1 Sheet 3 at 3.
[290] *See* EPA-R08-OAR-2012-0026-0087 in docket for Wyoming Regional Haze SIP/FIP, Ex. 2.

> catalyst layer. However, catalyst prices remain in the approximate range of $5,000-6,000/m3 and are anticipated to remain in this range during the next 5 years.[291]

EPA has relied on this study and these figures in conducting SCR cost analyses for BART evaluations. For example, in the cost effectiveness analyses for Wyoming power plants, EPA assumed a catalyst cost of $5,500/m3.[292]

PacifiCorp has not justified use of such a higher cost of catalyst than the range of $5,000-6,000/m3 and has greatly overstated the cost of catalyst for the Hunter Units 1 and 2 and Huntington Units 1 and 2 SCR cost analysis. Further, there is no justification for the use of an increase cost for replacement catalyst.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 12]

PacifiCorp Greatly Overstated the Property Tax in the SCR Cost Analyses.

PacifiCorp included in the Total Direct Annual Costs for its SCR cost analyses the costs of property tax on the SCR system at a rate of 1% of the total capital investment. This was a very significant annual cost of $1.8 million per year per unit.[293] As will be explained below, it was improper to assume the same 1% of the total capital investment in property taxes would apply every year for the Utah plants. Moreover, it appears that PacifiCorp also included property taxes in the capital costs of the SCR system at a cost of $2.8 million for Hunter 1 and 2 and $1.9 million for Huntington 1 and 2.[294] In reviewing the June 2012 BART submittals, it appears that PacifiCorp had previously included property taxes as a capital cost, and not as a direct annual cost.[295] However, it is confusing, because PacifiCorp's submittal also states that property taxes are included in the O&M costs.[296] Further, in its June 2012 BART submittals, PacifiCorp identified the property tax rate as 0.94%,[297] but then PacifiCorp used the 1% default property tax

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[291] *See* January 2010 Cichanowicz study, "Current Capital Cost and Cost-Effectiveness of Power Plant Emissions Control Technologies," at 6-5 to 6-6. Ex. 3.
[292] *See* EPA-R08-OAR-2012-0026-0087 in docket for Wyoming Regional Haze SIP/FIP, Ex. 2.
[293] 44 *See* PacifiCorp's August 2012 BART Update, Appendix A at page 6 (row 108) of the cost spreadsheet for each unit.
[294] *Id.*, Appendix B - Row 80 Direct Capital Costs – EPA Cost Effectiveness Comparison Spreadsheets.
[295] *See,* e.g., June 2012 BART submittal for Hunter 1, Appendix A-2 at 3.
[296] *Id.*, Appendix A-1 at 2.
[297] *Id.*, Appendix A-2, Exhibit 1 Sheet 1 at 2.

rate of the EPA's Control Cost Manual in determining annual property tax costs in its August 2014 BART Update.[298]

The EPA's Control Cost Manual only provides for the inclusion of property taxes as a direct annual (operations) cost.[299] Thus, it is not consistent with EPA cost methodologies to include property taxes both in the capital costs and the direct annual operations costs for the SCR systems evaluated.

Further, although the EPA's Control Cost Manual assumes a 1% default property tax rate,[300] PacifiCorp's June 2012 submittals indicate a property tax rate of 0.94% as stated above. Assuming this is the actual property tax rate applicable to the Hunter and Huntington plants, the actual 0.94% tax rate should have been used rather than EPA's 1% tax rate from the Control Cost Manual. Moreover, a review of Utah property tax regulations shows that it was not proper to expect the taxes to be based on the total capital investment for every year of the 20 year life assumed for the SCR. According to Utah property tax regulations, pollution control equipment is considered Class 8 Machinery and Equipment, which "is subject to considerable functional and economic obsolescence created by competition as technologically advanced and more efficient equipment becomes available."[301] Such equipment is taxed at a declining "Percent Good of Acquisition Cost" value of the equipment.[302]
Thus, for all of these reasons, PacifiCorp greatly overstated the annual costs of property taxes in its cost effectiveness analysis for SCR.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 13]

PacifiCorp Assumed a Much Higher Operational Capacity Factor in Determining Costs of SCR than it Assumed in Determining the Tons Per Year of NO_x ***That Would Be Reduced with LNB/OFA plus SCR.***

PacifiCorp assumed a 90% capacity factor in its cost analyses for SCR at each of the BART-subject units.[303] The capacity factor greatly impacts the cost analysis for the SCR system,

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[298] *See* PacifiCorp's August 2012 BART Update, Appendix A at page 6 (row 108) of the cost spreadsheet for each unit.
[299] EPA Control Cost Manual at 2-34.
[300] EPA Control Cost Manual, at 1-28.
[301] Utah tax regulation R884-24P-33(2)(g).
[302] *Id.*
[303] *See* PacifiCorp's August 2012 BART Update, Appendix A at page 1 (row 12) of the cost spreadsheet for each unit.

because the higher the capacity factor, the more flue gas flow that needs to be treated by the SCR system. The capacity factor directly impacts both the capital costs and annual operating costs. For the purposes of the cost analysis, the capacity factor is translated into an annual heat input based on the capacity factor multiplied by the number of possible operation hours in a year (i.e., 8,760 hours per year) multiplied by the maximum hourly heat input of 4,750 MMBtu/hr for Hunter Units 1 and 2 and 4,960 MMBtu/hr for Huntington Units 1 and 2.[304] Thus, for the purpose of the cost analysis, the annual heat input was assumed to be 37,449,000 MMBtu/year for Hunter Units 1 and 2 and 39,104,640 MMBtu/year for Huntington Units 1 and 2. Yet, for the purposes of calculating emission reductions with SCR plus LNB/OFA, PacifiCorp relied on the actual annual average heat input during the 2001 to 2003 timeframe. Those annual heat inputs used in calculating emission reductions were 31,372,895 MMBtu/yr for Hunter 1, 31,537,898 MMBtu/yr for Hunter 2, 31,365,923 MMBtu/yr for Huntington 1, and 29,899,997 for Huntington 2.[305] The annual heat inputs used to calculate the tons of NO_x removed reflect approximately 75% capacity factor for each Hunter 1 and Hunter 2 and 72% and 69% capacity factors for Huntington 1 and 2, respectfully. Thus, this is not an apples-to-apples comparison. Assuming a capacity factor of 90% for cost purposes requires purchasing and operating a larger SCR and use of more reagent than would be required for operations at a lower capacity of 69-75%, resulting in a higher cost estimate. At the same time, assuming that each unit will actually operate at the lower capacity factors results in a lower estimate of the actual emission reductions achieved with SCR. As a result, PacifiCorp's SCR+LNB/OFA cost effectiveness numbers are higher than they would be if a consistent capacity factor was assumed for emissions reductions to be achieved with these controls.

Table 1 below demonstrates what the cost effectiveness of SCR+LNB/OFA is using PacifiCorp's Total Annual Costs of SCR+LNB/OFA (notwithstanding the deficiencies discussed above) and the NO_x emissions reduced with SCR+LNB/OFA with each unit operating at 90% capacity factor. PacifiCorp's calculated cost effectiveness for SCR+LNB/OFA with the mismatched capacity factors is shown in the last line of the table. As Table 1 shows, without changing anything in PacifiCorp's cost estimates but simply assuming each unit operates at the 90% capacity factor assumed in the SCR cost analysis, the cost effectiveness of SCR +LNB/OFA is approximately \$3,700 to \$3,900 per ton of NO_x removed, compared to PacifiCorp's calculated cost effectiveness that ranged from approximately \$4,500 to \$4,800 per ton of NO_x removed.

[304] *Id.*, Appendix A at page 2 (row 47) of the cost spreadsheet for each unit.
[305] *Id.*, cover letter at 2-5.

Table 1. Cost Effectiveness of SCR+LNB/OFA Using PacifiCorp's Annual Cost Numbers and Assuming Operation of All Units at 90% Capacity Factor[57].

	Hunter 1	Hunter 2	Huntington 1	Huntington 2
Maximum Hourly Heat Input, MMBtu/hr	4,750	4,750	4,960	4,960
Annual Heat Input at 90% CF, MMBtu/yr	37,449,000	37,449,000	39,104,640	39,104,640
PacifiCorp's Total Annual Costs of SCR+LNB/OFA at 90% CF, $/yr	$24,539,094	$24,144,098	$24,101,813	$24,129,266
Baseline NOx rate, lb/MMBtu	0.401	0.382	0.375	0.386
SCR+LNB/OFA NOx Rate, lb/MMBtu	0.050	0.050	0.050	0.050
Annual Tons of NOx Removed with SCR+LNB/OFA at 90% CF	6,572	6,217	6,355	6,570
Cost Effectiveness of SCR+LNB/OFA at 90% CF	$3,734	$3,884	$3,793	$3,673
PacifiCorp's Cost Effectiveness of SCR+LNB/OFA at 90% CF for costs and actual CF during 2001-2003 for NOx emission reductions	$4,462	$4,616	$4,733	$4,804

[57] All of the data in this table is from the tables in PacifiCorp's August 6, 2014 letter to UDAQ with its updated BART analysis, with the exception of the annual heat input at 90% capacity factor, the tons of NO_x removed from baseline at 90% capacity factor, and the Cost Effectiveness of SCR+LNB/OFA at 90% capacity factor which were calculated.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, pp. 14-19]

Correction of Some of the Deficiencies in PacifiCorp's SCR Cost Analyses Shows that the Cost Effectiveness of SCR+LNB/OFA is Much More Cost Effective than PacifiCorp's Cost Numbers Indicate.

As discussed above, we have identified several deficiencies in PacifiCorp's cost analyses for SCR at Hunter Units 1 and 2 and Huntington Units 1 and 2 that overestimate the costs of SCR at these units. To reiterate, those deficiencies include:

Calculation of indirect capital costs for SCR improperly based on the direct capital cost of SCR and LNB/OFA rather than just based on the direct capital costs of SCR.

- Sales tax was included in capital costs, but no sales tax applies in Utah for pollution control equipment.
- PacifiCorp appears to have improperly included or double-counted Owner's Costs in the capital costs.
- Assumption of 2 SCR reactors needed per EGU not justified.

- Calculated costs based on urea which has higher capital and operational expenses compared to anhydrous ammonia, which is more commonly used in SCR applications.
- Assumed costs per pound of urea were much higher than used by EPA in recent BART analyses.
- Assumed costs per cubic feet for SCR catalyst are much higher than used by EPA in recent BART analyses.
- Property taxes were greatly overstated in SCR direct annual cost analyses and should not have been included in the capital costs at all.
- PacifiCorp estimated SCR costs assuming 90% capacity factor but determined emission reductions to be achieved based on much lower capacity factors (overstating costs and understating the emission reduction benefits).

Below, we have corrected PacifiCorp's SCR cost analyses for those issues which could be more readily corrected, given that the public was not provided with PacifiCorp's cost spreadsheets that could be modified. We recalculated PacifiCorp's direct capital costs of SCR to exclude property taxed and capital costs of LNB/OFA that should not have been included in the direct capital costs of SCR, and we recalculated the indirect installation costs, project contingency, and pre-production costs based on the revised PacifiCorp capital cost of SCR. We also revised the property taxes to reflect the declining percent good value provided in Utah's tax regulations. And, after recalculating total annual costs, we divided the annual costs by the tons per year of NO_x reduced with each unit operating at 90% capacity factor.

We first re-calculated the direct capital costs for SCR at each unit by subtracting the capitalized property taxes that should not have been included in the capital costs, as shown in Table 2 below.

Table 2. Revised PacifiCorp Direct Capital Costs of SCR +LNB/OFA Excluding Capitalized Property Taxes[58]

	Hunter 1	Hunter 2	Huntington 1	Huntington 2
PacifiCorp Row 80 Direct Capital Costs	$124,875,935	$122,947,212	$121,673,816	$122,258,814
PacifiCorp Capitalized Property Tax	$2,764,009	$2,773,612	$1,864,732	$1,863,726
Recalculated Direct Capital Costs Excluding Capitalized Property Tax	$122,111,926	$120,173,600	$119,809,084	$120,395,088

[58] Cost data from PacifiCorp's August 2012 BART Update, Appendix B – Row 80 Direct Capital Costs- EPA Cost Effectiveness Comparison.

Next, we re-calculated the indirect capital costs of SCR by subtracting the capital costs of low NO_x burners and overfire air from the recalculated direct capital costs of SCR (i.e., excluding capitalized property taxes from Table 2 above). Then, we applied the percentages from the EPA's Control Cost Manual, as relied on by PacifiCorp, for projecting indirect

capital costs of SCR. We then calculated a revised Total Capital Investment for SCR plus LNB/OFA for each unit.[306] The results of these re-calculations are shown in Table 3 below.

Table 3: Recalculated Total Capital Investment of SCR plus LNB/OFA[60]

PacifiCorp August 2014, Appendix A Row Number	Description of Cost	Hunter 1	Hunter 2	Huntington 1	Huntington 2
	Recalculated Direct Capital Costs of SCR+LNB/OFA Excluding Capitalized Property Tax	$122,111,926	$120,173,600	$119,809,084	$120,395,088
	PacifiCorp's Capital Costs of LNB/OFA	$11,586,773	$8,872,212	$8,325,049	$8,562,067
80	Recalculated Direct Capital Costs of SCR (Excluding LNB/OFA and Excluding Capitalized Property Tax)	$110,525,153	$111,301,388	$111,484,035	$111,833,021
86	Recalculated Indirect Installation Costs Due to General Facilities (0.05 x Direct Capital Costs)	$5,526,258	$5,565,069	$5,574,202	$5,591,651
87	Recalculated Indirect Installation Costs Due to Engineering and Home Office Fees (0.10 x Direct Capital Costs)	$11,052,515	$11,130,139	$11,148,404	$11,183,302
88	Recalculated Indirect Installation Costs Due to Process Contingency (0.05 x Direct Capital Costs)	$5,526,258	$5,565,069	$5,574,202	$5,591,651
89	Recalculated Total Indirect Installation Costs (Direct Capital Costs x 0.05 x 0.10 x 0.05)	$22,105,031	$22,260,278	$22,296,807	$22,366,604
90	Recalculated Project Contingency (Direct Capital Costs + Total Indirect Installation Costs) x 0.15	$19,894,528	$20,034,250	$20,067,126	$20,129,944
91	Recalculated Total Plant Costs (Direct Capital Costs + Total Indirect Installation Costs + Project Contingency)	$152,524,711	$153,595,915	$153,847,968	$154,329,569
92	AFUDC (PacifiCorp did not include)	Not Used in Cost Effectiveness Analyses			
93	Recalculated Preproduction Costs (0.02x Total Plant Costs)	$3,050,494	$3,071,918	$3,076,959	$3,086,591
94	PacifiCorp's Inventory Capital	$69,376	$69,376	$72,443	$72,443
95	PacifiCorp's Initial Catalyst and Chemicals	$35,000	$35,000	$35,000	$35,000
96	**Recalculated Total Capital Investment of SCR plus LNB/OFA (Plant Costs + Preproduction Costs+Inventory Capital + Initial Catalyst and Chemicals + PacifiCorp's Capital Costs of LNB/OFA).**	**$167,266,354**	**$165,644,422**	**$165,904,583**	**$166,395,815**
Compare PacifiCorp's Row 96	plus LNB/OFA based on improper inclusion of LNB/OFA in indirect costs of SCR and including Owner's Costs	$180,791,743	$177,483,372	$176,287,506	$176,517,450

[60] If a row is not identified as "recalculated," the cost is from PacifiCorp's August 2014 Appendix A worksheet.

[306] Although it appears that PacifiCorp double-counted or otherwise improperly included some Owner's Costs in the direct capital costs as discussed above, we did not exclude those costs in this analysis, because PacifiCorp's seems to indicate in its discussion of this issue that it only included Owner's Costs in the indirect installation costs for Engineering and Home Office fees.

As Table 3 above demonstrates, the recalculated capital investment of SCR plus LNB/OFA are about 6% lower when capitalized property tax and owners costs are excluded and when indirect capital costs of the SCR are calculated just based on the direct capital costs of SCR.

Next, we recalculated the annual property taxes for the SCR plus LNB/OFA based on PacifiCorp's stated property tax rate of 0.94% and based on the Percent Good valuation required by the Utah Property Tax Regulations. As previously stated, for Class 8 equipment such as pollution control equipment, Utah Property Tax Rule R884-24P-33 provides that the taxable value of Class 8 property is calculated by applying the percent good factor against the acquisition cost of the property.[307] The State Tax Commission's 2014 Recommended Personal Property Valuation Schedules indicate the following percent good factors for Class 8 equipment:

Utah Percent Good Valuation Schedule for Class 8 Property[62]

Year	Percent Good of Acquisition Cost
2014	
2013	93%
2012	87%
2011	80%
2010	71%
2009	64%
2008	57%
2007	50%
2006	42%
2005	34%
2004	23%
2003	12%

[62] *See* Table 1 of 2014 Recommended Personal Property Valuation Schedules And Registered Vehicle Uniform Fees, Utah State Tax Commission, Property Tax Commission, Ex. 4.

Based on this percent good valuation schedule and a 0.94% property tax rate, we recalculated property tax for the SCR plus LNB/OFA for the assumed 20 year life of the controls, assuming the property taxes are based on a valuation of the total capital investment costs using 100% for the 1st year, 93% for the second year, 87% for the third year, and so on with a 12% percent good factor applied in the 12th through 20th year. Then we took the annual average of these annual property taxes to reflect the declining property taxes over time. This is a much more appropriate level of property taxes to include in the indirect operation costs as compared to PacifiCorp's

[307] Utah Rule 884-24p-033(2)(g)(ii).

approach of assuming 1% of the total capital investment of the pollution controls would apply every year. However, our analysis of property taxes is likely overestimated because we based the tax on the total capital investment (recalculated as show in Table 3 above), whereas property taxes are based on the "acquisition cost" which does not include indirect costs.[308]

Table 4 below shows the recalculated average annual property taxes using the declining percent good method for each of the BART-subject units.

Table 4: Recalculated Annual Average Property Taxes for SCR plus LNB/OFA Assuming Tax Rate of 0.94%[64]

	Hunter 1	Hunter 2	Huntington 1	Huntington 2
Recalculated Average Annual Property Taxes Per Year, Based on the Recalculated Total Capital Investment of SCR plus LNB/OFA.	$635,997	$629,830	$628,739	$631,508
Compare to PacifICorp's Assumed Property Tax Cost Per Year (Row 109 of Appendix A of August 2014 BART Update)	$1,807,917	$1,774,834	$1,762,875	$1,765,174

[64] The details of these calculations are provided in Ex.5, Worksheet entitled Revised Calculation of Annual Property Taxes.

As Table 4 demonstrates, PacifiCorp has greatly overstated the annual property taxes by not accounting for the fact that Utah tax rules provide for a declining value of pollution controls over time.

Last, we recalculated cost effectiveness of SCR plus LNB/OFA for the Hunter Units 1 and 2 and Huntington Units 1 and 2 using the corrected total capital investment costs of these controls from Table 3 above, using the recalculated annual average property taxes from Table 4 above, and using the annual tons of NO_x removed with SCR plus LNB/OFA with all units operating at 90% capacity factor from Table 1 above.

To determine the annualized capital costs, the total capital costs are multiplied by the cost recovery factor. The capital recovery factor (CRF) is based on the following equation:

$$CRF = [i(1+i)^n]/[(1+i)^n - 1]$$

where i is the interest rate and n is the life of the pollution control equipment. In essence, annualization establishes an annual payment sufficient to finance the capital investment for its entire life.[309] PacifiCorp assumed an interest rate of 7% and a 20 year life of the pollution control

[308] Utah Rule 884-24p-033(1)(a)(i).
[309] US EPA Air Pollution Control Cost Manual, EPA/452/B-02-001, Section 2, at 2-21 (January 2002), available at https://www3.epa.gov/ttncatc1/dir1/c_allchs.pdf.

equipment, for a CRF of 0.094. Although we think a 7% interest rate is too high as will be discussed in Section II of this document, for the purpose of this recalculation of PacifiCorp's cost effectiveness of SCR plus LNB/OFA, we did not change the assumed interest rate. The annualized capital costs, also called the indirect capital costs, of LNB/OFA plus SCR were calculated based on the revised total capital costs from Table 3 above and the CRF of 0.094.

The recalculated annual average property taxes were used in lieu of PacifiCorp's calculated annual property tax in recalculated total direct annual costs for the four units. The total direct annual costs are based on the maintenance cost + the total variable direct cost + property tax. The maintenance costs were calculated based on 1.5% of the Total Capital Investment of SCR. Therefore, because we recalculated the total capital investment, we also recalculated the maintenance costs. The total variable costs include the costs for electricity, reagent, catalyst, and water. Even though we have shown above that PacifiCorp assumed too high of costs for urea and catalyst, we did not revise these costs.

Table 5 below shows the specific costs that we revised, recalculated total annual costs, and recalculated cost effectiveness with the tons of NO_x removed at 90% capacity factor.

Table 5. Revised Total Annual Costs and Cost Effectiveness of SCR plus LNB/OFA at 90% Capacity Factor

PacifiCorp August 2014, Appendix A Row Number	Description of Cost	Hunter 1	Hunter 2	Huntington 1	Huntington 2
96	Recalculated Total Capital Investment of SCR plus LNB/OFA (Total Capital Investment of SCR + PacifiCorp's Capital Costs of LNB/OFA)	$167,266,354	$165,644,422	$165,357,420	$166,085,670
97	Recalculated SCR Maintenance Cost (0.015 x Total Capital Investment of SCR)	$2,508,995	$2,484,666	$2,480,361	$2,491,285
107	PacifiCorp's Total Variable Direct Cost	$2,953,839	$2,953,839	$3,054,331	$3,054,331
108	Recalculated Total Direct Annual Cost (Maintenance Cost + Total Variable Direct Cost + Property Taxes)	$6,098,831	$6,068,335	$6,163,431	$6,177,124
109	Recalculated Average Annual Property Tax Factor	$635,997	$629,830	$628,739	$631,508
111	Capital Recovery Factor (interest = 7%, N = 20 years)	0.0944	0.0944	0.0944	0.0944
112	Recalculated Indirect Annual Costs (CRF x Total Capital Investment)	$15,788,761	$15,635,662	$15,608,571	$15,677,312
113	Recalculated Total Annual Costs (Direct Annual Costs + Indirect Annual Costs)	$21,887,592	$21,703,997	$21,772,001	$21,854,436
114	Recalculated Annual NOx Removed from baseline (2001-2003 average) at 90% Capacity Factor	6,572	6,217	6,355	6,570
115	Recalculated Cost Effectiveness of SCR plus LNB/OFA	$3,330	$3,491	$3,426	$3,327

As Table 5 demonstrates, the correction of just come of the more significant flaws in PacifiCorp's cost analysis results in much lower total annual costs and much lower cost effectiveness values than PacifiCorp's overstated SCR cost analysis does.

In the next section of these comments, we have presented an independent cost analysis of SCR for Hunter 1 and 2 and Huntington 1 and 2 which demonstrates that the costs of SCR and cost effectiveness of SCR plus LNB/OFA are even lower than our recalculation of parts of PacifiCorp's SCR cost estimate shows in Table 5.

Response: This comment pertains to the costs that PacifiCorp submitted to UDAQ, and which UDAQ included in its SIP submittal to EPA. However, EPA developed separate costs to support our FIP, and has updated those costs in support of our final action. Accordingly, we are only responding to comments directed at the costs developed by EPA. Nonetheless, refer to our responses elsewhere where similar issues may be discussed. To the extent that this comment could be applied to EPA's cost estimates, we note that the comment generally attempts to show that SCR is more cost-effective than PacifiCorp estimated. As we find SCR to be reasonably cost-effective based on our estimates (which in any case we think are correctly derived), any comment intended to show that SCR is even more cost-effective would not change our BART determination.

Comment: [Conserv Orgs -- Stamper Report, p. 20]

Analysis of SCR Plus LNB/OFA Cost Effectiveness for Hunter Units 1 and 2 and Huntington Units 1 and 2 Using the Sargent & Lundy Integrated Planning Model SCR Cost Module

We used the Sargent & Lundy SCR cost module that was developed for estimating SCR costs for the Integrated Planning Model (IPM)[310] to estimate the costs of SCR at the BART-subject units at the BART-subject EGUs in Utah, with some important modifications to ensure more realistic costs and consistency with the methodology of the EPA's Control Cost Manual. EPA has used the Sargent & Lundy cost module to estimate the cost for SCR in its evaluation of NO_x BART for the BART-subject EGUs in Arizona[311] and in Wyoming.[312] EPA also relied on the Sargent & Lundy SCR cost module to estimate capital costs of SCR in its proposed federal implementation plan (FIP) addressing regional haze in Montana.[313] According to EPA, the IPM controls costs are based on databases of actual SCR project costs and take into consideration coal type, boiler type, and NO_x reduction efficiency.[314]

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[310] *See* Documentation for the EPA Base Case v.4.10 Using the Integrated Planning Model, August 2010, EPA #430-R-100/10 and, in particular, see Appendix 5-2A SCR, available at http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v410/Appendix52A.pdf. A copy of Appendix 5-2A, IPM Model – Revisions to Cost and Performance for APC Technologies, SCR Cost Development Methodology, August 2010, prepared by Sargent & Lundy, is attached as Ex. 6.

[311] 77 Fed. Reg. 42852 (July 20, 2012).

[312] *See* February 7, 2013 Memo from Jim Staudt, Andover Technology Partners, to Doug Grano, EPA, at 3 (in Docket for EPA's rulemaking on the Wyoming Regional Haze Plan at Docket ID: EPA-R08-OAR-2012-0026-0086, available at www.regulations.gov).

[313] 77 F.R.24044 (April 20, 2012).

[314] *Id.*

Response: Comment noted. However, in EPA's cost estimates in support of this rulemaking we have relied in part on the site-specific costs supplied by PacifiCorp and included in the state's SIP submittal, and not the IPM cost modules. PacifiCorp applied some of the factors and format of the 2002 CCM with their site-specific costs. However, the costs provided by PacifiCorp were adjusted by EPA to account for items that are double-counted or should not be allowed under the CCM, such as AFUDC. We believe that this approach can yield a more accurate estimate of SCR control costs than using the IPM control cost modules. This is because the IPM cost modules only allow for consideration of a limited number of site-specific factors, such as coal type, boiler type, and NO_x reduction efficiency. Regardless, EPA's approach yields similar cost effectiveness values to those suggested by the commenter. In either case, the cost effectiveness of SCR is reasonable when taken into consideration with the other BART factors.

Comment: [Conserv Orgs -- Stamper Report, p. 20]

Assumed* NO_x *Emission Rate with SCR Plus New/Upgraded Combustion Controls (Low* NO_x *Burners/Overfire Air).

In the cost analysis for the SCR systems, we assumed a controlled NO_x rate of 0.05 lb/MMBtu with the SCR plus the new low NO_x burners and SOFA at each unit. This NO_x rate reflects a NO_x removal across the SCR of approximately 75%-80% at each unit.[315] Ninety percent control is readily achievable with SCR systems at coal-fired boilers, and thus the BART-subject units in Utah could likely achieve even lower NO_x emission rates than 0.05 lb/MMBtu with SCR plus LNB/OFA.

EPA analyzed Clean Air Markets NO_x data for 22 existing units with retrofitted SCRs that are achieving limits below 0.07 lb/MMBtu on a 30-day rolling average. Eight of these units were operating at or above 90% removal efficiency and not one was operating at less than 86%.[316]Moreover, this data was collected from 2003, before the NO_x SIP Call[317] and other regulatory programs for NO_x were in place. Because compliance with the NO_x SIP Call was generally not required until May of 2005, performance has improved since that point.[318]

This high level of performance is reflected in the emission rates that are being achieved. SCR system designers have analyzed EPA's Clean Air Market's continuous emission monitoring systems data to determine the NO_x levels that are currently being achieved by over 100 SCR-

[315] The percent NO_x control from the LNB/OFA NO_x emission limit of 0.26 lb/MMBtu is 80%. However, the Hunter 2 and Huntington 1 and 2 units with LNB/OFA have been achieving much lower rates in the range of 0.2 to 0.22 lb/MMBtu, which means a 0.05 lb/MMBtu limit with SCR would only reflect 75% to 77% removal. There is not enough data to know the emission rates that will be achieved at Hunter Unit 1 with its new LNB/OFA, but it is very likely to be in the same range of 0.20 to 0.22 lb/MMBtu.

[316] Srivastava et al., Nitrogen Oxides Emission Control Options for Coal-Fired Electric Utility Boilers, Table 4, Available at: http://www.netl.doe.gov/technologies/coalpower/ewr/pubs/NOx%20control%20Lani%20AWMA%200905.pdf (Ex. 7).

[317] Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, 63 F.R. 57356 (Oct 27, 1998).

[318] Manuel J. Oliva and Sikander R. Khan, Performance Analysis of SCR Installations on Coal-Fired Boilers, Pittsburgh Coal Conference, September 2005, p. 3 Ex. 8.

equipped coal-fired boilers. This analysis identified 25 units that are achieving NO_x emissions less than 0.05 lb/MMBtu on an hourly average basis.[319] Others have reported similar results.[320]

Thus, for all of these reasons, we used a 0.05 lb/MMBtu emission rate as the achievable NO_x limit with the addition of SCR plus LNB/OFA at the BART-subject units in Utah.

Response: We concur that it is reasonable to use an annual emission rate of 0.05 lb/MMBtu when calculating the costs of compliance for SCR (with combustion controls), and have used this emission rate in the cost analysis support this rulemaking. However, because the control efficiency of SCR is highly dependent on the post-combustion control emission rate, we disagree that 90% percent control is readily achievable with the SCR systems at the Utah BART EGUs and that therefore a much lower emission rate is achievable. For example, the Utah BART units, as equipped with combustion control upgrades, currently achieve annual emission rates of approximately 0.20 to 0.22 lb/MMBtu, which yields a controlled annual emission rate with SCR of 0.02 lb/MMBtu (annually) if a 90% control efficiency is assumed. The EPA is unaware of, and the commenter has not documented, any coal-fired EGU retrofits achieving this level of performance.

In addition, the commenter misunderstands the Clean Air Markets (CAMD) NO_x control efficiency data for 22 existing units retrofitted with SCR as it relates to the control efficiency estimated by EPA for the four Utah BART EGUs. The control efficiency data cited by the commenter is reported using an assumed pre-control baseline of 0.5 lb/MMBtu, and so represents the percent reduction from *both combustion controls and SCR* (refer to footnote c Table 4 in the publication cited by the commenter). By contrast, the control efficiencies noted by the commenter for the Utah BART EGUs (i.e. 75%-80% at each unit) represent the percent reduction from *SCR alone*. In essence, the commenter compares apples to oranges. If a similar pre-control baseline of 0.5 lb/MMBtu (annual) were assumed for the Utah BART units, the resulting control efficiency would be 90% (at the assumed annual controlled rate of 0.05 lb/MMBtu).

Finally, we are clarifying that the 0.05 lb/MMBtu assumed by EPA is an *annual emission rate* used for calculating annual emission reductions that are in turn used to calculate cost effectiveness. This is not the same as the *emission limit*, which is expressed on a 30-day rolling average basis. We have set the 30-day emission limit to be somewhat higher than the assumed annual emission rate in order to account for 1) the shorter averaging period, 2) the requirement that the emission limit apply at all times, including during startup, shutdown, and malfunction.

Comment: [Conserv Orgs -- Stamper Report, p. 21]
Modifications Made to the Sargent & Lundy SCR IPM Cost Module.

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[319] Clay Erickson, Robert Lisauskas, and Anthony Licata, What New in SCRs, DOE's Environmental Control Conference, May 16, 2006, p. 28. Available here: http://www.netl.doe.gov/publications/proceedings/06/ecc/pdfs/Licata.pdf (Ex. 9); LG&E Energy, Selective Catalytic Reduction: From Planning to Operation, Competitive Power College, December 2005, p. 75-77. Ex. 9.
[320] M.J. Oliva and S.R. Khan, Performance Analysis of SCR Installations on Coal-Fired Boilers, Pittsburgh Coal Conference, September 2005 Ex. 8.

We modified the Sargent & Lundy SCR cost module to make it consistent with the methodology of the EPA's Control Cost Manual and to more realistically estimate costs of SCR, as discussed below.

(1) Modifications to Make the Methodology Consistent with the Overnight Costing Methodology of the EPA's Control Cost Manual.

EPA typically requires, and has required for some time, that BART cost determinations be based on EPA's Control Cost Manual to have a consistent basis for comparison to other States' BART cost determinations.[321] This is very important because, as EPA has done for years with BACT determinations, the costs that other subject-to-BART sources have had to bear to comply with regional haze requirements are used as a benchmark for determining if the cost of pollution control at a source in question is reasonable.[322] In other words, if other similar sources have had to bear similar costs for a particular control technology to meet BART, then such costs should be considered reasonable for another source of the same source category, taking into account other factors that define BART including the degree of improvement in visibility expected to result with the pollution control. The only way such comparisons can be properly made is with the consistent use of the same cost methodology.

The costing methodology of the Control Cost Manual is based on the "overnight" method of cost estimation, widely used in the utility industry.[323] The overnight cost is the present value cost that would have to be paid as a lump sum up front to completely pay for a construction project.[324] The overnight costing methodology converts the capital cost estimates into an annual cost in current real dollars without any inflation.

The overnight costing methodology must be used regardless of the source of the capital cost data. The only exceptions are as to the source of capital cost estimates – vendor quotes, equipment bids, budget estimates.

The Sargent & Lundy SCR module of the IPM model does not use the overnight method to calculate costs. Rather, it calculates various components of all-in cost inputs expressed in $/kW, $/kW-yr, and $/MWh for input into the IPM model itself.[325] The IPM model seeks to estimate the actual cost of control equipment to the owner and thus is based on an all-in costing method. Among other differences with EPA's Control Cost Manual, the Sargent & Lundy SCR Cost Module includes costs that are excluded from consideration in the Control Cost Manual, including owners' costs and allowance for funds used during construction (AFUDC).

To make the Sargent & Lundy SCR cost module consistent with the overnight costing methodology, we made the following changes to the capital cost estimate in the Sargent & Lundy SCR cost module:

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[321] *See* 40 C.F.R. Part 51, App. Y, Section IV.D (describing under Step 4.a. Impact analysis part 1: How do I estimate the cost of control?).

[322] *See* U.S. EPA, Draft New Source Review Workshop Manual, at B.29 (Oct. 1990), available at https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf.

[323] *See* EPA Air Pollution Control Cost Manual, EPA/452/B-02-001, Section 2.3 to 2.4 (January 2002).

[324] Steven Stoft, Power Economics: Designing Markets for Electricity, 2002.

[325] EPA, Documentation Supplement for EPA Base Case v. 4.10 FTransport – Updates for the Final Cross-State Air Pollution Rule (CSAPR), p. 2-6, http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v410/Chapter2.pdf.

First, as explained above, AFUDC is never allowed in an overnight cost analysis. Thus, we set this cost equal to zero.

Second, the SCR module includes a labor cost, in addition to normal loaded labor rates, that is figured as 10% of the base capital cost in IPM, to account for overtime inefficiency and per diem required to attract labor. This charge is never allowed in an overnight cost effectiveness analysis. This is a future award for failure to plan. The SCRs would be installed and catalyst would be changed out during normal maintenance outages. Efficient upfront planning and scheduling of the labor pool should not result in an overtime inefficiency.[326] Therefore, there is no reason to plan for inefficiency. This charge has been eliminated by EPA in other BART cost effectiveness analyses as it is not consistent with the Control Cost Manual's costing method.[327] Thus, we set this cost equal to zero.

Third, owner's costs are included as 5% of the total project cost in the Sargent & Lundy cost module. These are not valid SCR costs and have been eliminated by EPA from BART cost effectiveness analyses in other cases. Projects that are completed overnight do not incur any owner charges.[328] Thus, we set this cost equal to zero.

Certain assumptions in the Sargent & Lundy SCR cost module would tend to overestimate costs of SCR, and thus we revised those assumptions as detailed below.

Catalyst Cost
First, a unit cost for catalyst of $8,000/m3 is used in the Sargent & Lundy IPM SCR module to estimate catalyst change-out cost. This is very high compared to values typically quoted by vendors, depending upon volume per order.[329] In addition, for plants with multiple units installing SCRs, the high volume order would warrant a unit price reduction. Further, costs can be lowered further by using regenerated catalyst, which additionally reduces the SO_2 /SO3 conversion.[330]

A January 2010 study, "Current Capital Cost and Cost-Effectiveness of Power Plant Emissions Control Technologies" states as to catalyst cost:

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[326] *See* Documentation Supplement for EPA Base Case v. 4.10 FTransport – Updates for the Final Cross-State Air Pollution Rule (CSAPR), http://www.epa.gov/airmarkt/progsregs/epa-ipm/transport.html.
[327] *See* Response to Technical Comments for Sections E. through H. of the Federal Register Notice for the Oklahoma Regional Haze and Visibility Transport Federal Implementation Plan, 12/13/2011 [Docket ID EPA-R06-OAR-2010-0190-0057]. Ex. 10.
[328] *See* Complete Response to Comments for NM Regional Haze/Visibility Transport FIP, Docket No. EPA-R06-OAR-2010-0846, 8/5/2011, at 3-4. Ex. 11.
[329] Letter from Callie A. Videtich, Director, Air Program, EPA Region 8, to Terry O'Clair, Director, Division of Air Quality, North Dakota Department of Health, Re: EPA Region 8 Comments on December 2009 Draft Regional Haze SIP (Public Comment Version), January 8, 2010, Enclosure 2, p. 28. Ex. 12; Email from Anthony C. Favale, Director - SCR Products, **Hitachi** Power Systems America, Ltd., to Anita Lee, U.S. EPA, Region 9, Re: CX Catalyst Question, April 1, 2010 ($5,500/m3 to $6,000/m3). Ex. 13; Email from Flemming Hansen, Manager SCR DeNOx Catalyst, **Haldor Tøpsoe**, to Phyllis Fox, P.E., Re: Catalyst Cost, January 23, 2008 ($6,000/m3) . Ex. 14.
[330] Mark Ehrnschwender and April Freeman Sibley, SCR Catalyst Regeneration – 10 Years of R&D Development and Commercial Application, Mega Symposium (2008), available athttp://secure.awma.org/presentations/Mega08/Papers/a104_1.pdf.

The minimum price of near $4,000/m3 first occurred in 2005, and prices approximating this level continue today. Limited catalyst availability, requiring orders to be place almost one year in advance, was observed in recent years as many operators prepared seasonal SCR reactor for annual operation, which included supplementing or replacing existing catalyst layer. However, catalyst prices remain in the approximate range of $5,000-6,000/m3 and are anticipated to remain in this range during the next 5 years.[331]

The IPM model cites no basis for the $8,000/m3 cost used to estimate annual catalyst change-out costs. In our cost estimates, we have revised the annual operations and maintenance catalyst change-out cost to use $5,500/m3 which is the mid-range of the study quoted above. EPA also used a catalyst cost of $5,500/m3 in its SCR cost analyses for the power plants in Wyoming.[332]

Second, the SCR module of the IPM model does not amortize the catalyst costs in estimating replacement cost, resulting in a significant overestimate in catalyst O&M. Cost effectiveness is the annual cost divided by the annual emission reductions. Thus, all costs must be expressed on an annual basis. Catalyst is used for more than one year, typically 2 to 3 years. The IPM model does not annualize the cost of replacement catalyst. The EPA's Control Cost Manual explains that the future worth factor should be used to amortize the catalyst cost over the years preceding the actual catalyst purchase.[333]

As money is allocated in advance of purchase, the sum of the annual catalyst replacement cost is less than the purchase price of the catalyst. Thus, the purchase price should have been multiplied by a future worth factor.

Response: These comments are not pertinent because the costs developed by EPA in support of this rulemaking do not rely on the IPM cost module. Refer to our response elsewhere in relation to the use of the IPM cost modules. We note that even if we relied on the IPM cost module and agreed with these comments, we could continue to find that SCR is reasonably cost-effective.

Comment: [Conserv Orgs -- Stamper Report, p. 10]

Auxiliary Power

The Sargent & Lundy SCR module of the IPM model excludes auxiliary power from the variable O&M cost, but instead, estimates a percentage and reports the cost of the auxiliary power at $0.06/kWh. Auxiliary power is the power required to operate the SCR system, including increased fan power to overcome the added pressure drop across the catalyst, ductwork, and reagent supply system. Thus, we have included it in our estimate of operations and maintenance costs, based on the IPM estimate of the fraction of the electrical output that is used to run the SCR system.

Further, the default unit cost of electricity used in the IPM model of $0.06/kWh is much higher than the auxiliary power cost commonly used in cost effectiveness analyses. Auxiliary power is

[331] J. Edward Cichanowicz, Current Capital Cost and Cost-Effectiveness of Power Plant Emissions Control Technologiesat Table 6-1. Ex. 3(Jan. 2010).

[332] *See* EPA-R08-OAR-2012-0026-0087 in docket for Wyoming Regional Haze SIP/FIP, Ex. 2; EPA Air Pollution Control Cost Manual, EPA/452/B-02-001, at 2-47 (January 2002).

[333] EPA Control Cost Manual, Section 4.2, Chapter 2, at 2-47.

the power required to run the plant, or power not sold. Cost effectiveness analyses are based on the cost to the owner to generate electricity, or the busbar cost, not market retail rates. The site-specific data reported by PacifiCorp to FERC in 2012 indicates that the busbar power cost for the Hunter and Huntington units is less than $0.03 lb/kWhr.[334] Further, PacifiCorp used an electrical power cost in its August 2014 BART update of $0.03/kWhr.[335] Thus, we assumed a cost of electricity of $0.03/kWh for all PacifiCorp BART-subject units in Utah.

Response: This comment is not pertinent because the costs developed by EPA in support of this rulemaking do not rely on the IPM cost module to estimate the costs of auxiliary power. Instead, EPA relied on the procedures in the 2002 CCM to calculate auxiliary power costs. However, we do agree with the commenter that it is appropriate to use the busbar power costs reported to FERC, and have used costs taken from the FERC Form 1 for 2014. Refer to the ATP report and associated spreadsheet located in the docket.

Comment: [Conserv Orgs -- Stamper Report, p. 24]

Reagent

We note that the costs in the Sargent & Lundy cost module are based on the use of a 50% urea solution as a source of ammonia. As discussed above, this is the most expensive source of ammonia. The assumption of a 50% urea solution results in overestimating both capital and O&M costs for the SCR, and so we are being conservative in relying on the Sargent & Lundy cost module for this parameter.

The Sargent & Lundy default cost for the urea is $310/ton. Based on recent data collected by EPA, this seems low. We increased this to $450/ton, which was the urea cost used in EPA's SCR cost effectiveness analyses for Wyoming power plants.[336]

Response: This comment is not pertinent because the costs developed by EPA in support of this rulemaking do not rely on the IPM cost module to estimate SCR reagent costs. Instead, EPA relied on the procedures in the 2002 CCM to calculate reagent costs. In addition, we have used a more recent cost for delivered urea in our Utah cost analysis. Refer to the ATP report and associated spreadsheet located in the docket.

Comment: [Conserv Orgs -- Stamper Report, pp. 24-25]

Property Taxes

Property taxes are not included in the Sargent & Lundy IPM Cost Module, so we calculated the average annual property taxes over a 20 year life using the percent good valuation factors discussed in Section I.B above.

Response: We agree that property taxes should be included in the SCR cost estimates, and have calculated them in a manner similar to that suggested by the commenter. Refer to the ATP report and associated spreadsheet located in the docket.

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[334] PacifiCorp 2012 FERC Form 1, p. 402.1 to 402.2. Ex. 15.
[335] *See* August 2014 PacifiCorp BART Update, Appendix A at row 37 in each unit's cost spreadsheet.
[336] *See* EPA-R08-OAR-2012-0026-0087 in docket for Wyoming Regional Haze SIP/FIP, Ex. 2.

Comment: [Conserv Orgs -- Stamper Report, pp. 25-26]

Determination of Total Annual Costs of NO_x ***Controls.***

In order to determine cost effectiveness of NO_x controls, the NO_x pollution control costs have to be converted total annual costs. The Sargent & Lundy SCR Cost Module does not present the costs in this manner, so we have calculated total annual costs of the SCR controls as follows.

O&M Costs

For the O&M costs generated by the Sargent & Lundy cost module, the costs are estimated in terms of $/kWyr and $/MWh. We converted these costs to annual costs assuming the units would operate at the same capacity factor as the units operated at during the baseline period.

Annual Capital Costs

Total capital investment includes all costs required to purchase equipment needed for a control system, the costs of labor and materials for installing the equipment, costs for site preparation and buildings, and certain other indirect installation costs. The total capital investment is converted to annual costs by multiplying by a capital recover factor or CRF. The CRF is given by:

$$CRF = [i(1+i)^n]/[(1+i)^n - 1]$$

where i is the interest rate and n is the life of the pollution control equipment. In essence, annualization establishes an annual payment sufficient to finance the capital investment for its entire life.[337]

The interest rate for the calculation of CRF should be source-specific. Section 2.4.2 of the EPA's Control Cost Manual states:

> …the social rate of interest [the 7%] is probably not appropriate for industry…the industrial planner must. . . understand how the cost of each device fits into the financial structure of their business . . .[T]he source may find it useful to apply their own interest rate to the calculation of control costs. Common interest rates used by industry and accepted by the EPA for source petitions include the business' current borrowing rate, the current prime rate, and other acceptable industrial rates of return.

Section 2.4.4.3 of the Control Cost Manual seems to indicate that real financing rates must be used for also industry cost evaluations, by stating:

Determination of an appropriate interest (discount) rate: for States, local, Tribal, and other environmental management organizations, the EPA's seven percent social discount rate will probably be the most appropriate. Industrial users of this Manual should consult with their financial officers and/or trade association for input.

In 2001, when the SCR section of the EPA's Control Cost Manual was being drafted, the real cost of debt for investor-owned utilities was about 7%. Thus, 7% was used in the sample SCR problem and in the text of the Control Cost Manual. However, in 2012, the cost of capital to all borrowers has rather dramatically changed. The current cost of capital to the company should be

[337] EPA Air Pollution Control Cost Manual, EPA/452/B-02-001, Section 2, at 2-21 (January 2002), available at https://www3.epa.gov/ttncatc1/dir1/c_allchs.pdf.

used in cost effectiveness analyses. Our review of the real cost of capital to PacifiCorp finds that it is 5.66%.[338] We used a 7% interest rate in our cost analysis to be consistent with UDAQ and PacifiCorp, but it must be noted that use of PacifiCorp's real cost of capital would result in lower annual costs for SCR and lower cost effectiveness numbers.

We assumed a lifetime of the SCR of 20 years, as well as the low NO_x burners and SOFA, in determining annualized capital costs of NO_x controls at the BART-subject units. This is a conservative assumption. We think the lifetime of an SCR is 30 years or more.[339] Many utilities routinely specify 30+ year lifetimes in requests for proposal and to evaluate proposals. In its NO_x BART analysis for the San Juan Units 1 through 4, EPA assumed a 30 year life of the SCRs in its cost effectiveness analysis.[340] A study of the economic risks from SCR operation at the Detroit Edison Monroe power plant, for example, used 30 years as the anticipated lifetime.[341] Although we think a 30 year life is supportable for determining cost effectiveness of SCR, we have assumed a 20 year life both to be conservative and to provide for more direct comparison to recent BART determinations made by EPA. It must be noted that had we assumed a 30 year life of the pollution controls, the annual costs and the cost effectiveness values would have been lower.

Assuming an interest rate of 7% and a 20 year life of the SCR equates to a CRF of 0.0944.

Response: We disagree that it is inappropriate to use an interest rate of 7% for the purpose of calculating the CRF for annualizing the total capital investment. The use of a 7% social discount rate is consistent with guidance contained in the Office of Management and Budget, Circular A-4, for regulatory analysis.[342] Circular A-4 states:

> As a default position, OMB Circular A-94 [a prior OMB document regarding interest rates] states that a real discount rate of 7 percent should be used as a base-case for regulatory analysis. The 7 percent rate is an estimate of the average before-tax rate of return to private capital in the U.S. economy. It is a broad measure that reflects the returns to real estate and small business capital as well as corporate capital. It approximates the opportunity cost of capital, and *it is the appropriate discount rate whenever the main effect of a regulation is to displace or alter the use of capital in the private sector*.

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[338] PacifiCorp was recently authorized a rate of return of 7.94% by the Utah Public Service Commission in Docket No. 10-35-124. PacifiCorp operates in six states (Utah, Oregon, Wyoming, Washington, Idaho, and California), but Utah is the largest with over 40% of the total. As of June 21, 2012, the return on long-term treasuries was 2.30% and 2.68% for 30 years. The return on inflation-adjusted treasuries was 0.13% for 20 years and 0.52% for 30 years. This implies a market expectation of inflation of 2.16% or 2.17%. *See* http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield. At 2.16% inflation, the real rate of return would be 5.66% (i.e., 1.0794/1.0216 = 5.66%).

[339] In fact, EPA has proposed to use a lifetime of 30 years for tail-end SCRs in its draft revisions to Chapter 2 of its Control Cost Manual.

[340] *See* U.S. EPA, Complete Response to Comments for NM Regional Haze/Visibility Transport FIP, Docket No. EPA-R06-OAR-2010-0846, 8/5/2011, at 46-47. Ex. 11.

[341] 97 S.D. Unwin and others, Selective Catalytic Reduction (SCR) System Design and Operations: Quantitative Risk Analysis of Options, Presented at CCPS 17th Annual International Conference: Risk, Reliability, and Security, p. 3. Ex. 16.

[342] Office of Management and Budget, Circular A-4, Regulatory Analysis (Sept. 17, 2003).

Id. (emphasis added).

While, as described by the commenter, the CCM may indicate that industry actors may wish to use a different interest rate for their own calculations, it intends for EPA to use the interest rate set by the OMB for regulatory purposes. The CCM states that the 7 percent rate used for regulatory purposes "differs from that used in non-governmental financial analyses. It represents a social interest rate established by the Office of Management and Budget (OMB) for the comparison of public policy issues." CCM, Section 2.4.2, at 2-12. Thus, our use of 7% is consistent with both OMB guidance and the CCM.

The use of a consistent 7% social discount rate allows for the comparison of cost-effectiveness values across sources. Correspondingly, we have used a 7% interest rate in a number of other Regional Haze rulemakings, including for Montana and Wyoming.

Finally, the EPA's use of a 7% interest rate for estimating BART costs has been upheld by the U.S. 9th Circuit Court of Appeals. The Court rejected the same argument the commenter makes here:

> [NPCA] 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.*

Nat'l Parks Conservation Ass'n v. U.S. EPA, 788 F.3d 1134, 1143-44 (9th Cir. 2015).

Refer to our response elsewhere in regard to the equipment life of SCR. Finally, we note here as elsewhere in response to the Conservation Organizations' comments that we find SCR to be reasonably cost-effective based on our own cost estimates—which we continue to think were done correctly—so that even if we accepted these comments we would merely continue to find SCR cost-effective.

Comment: [Conserv Orgs -- Stamper Report, p. 27]

Determination of NO_x ***Emission Reductions with SCR and Low*** NO_x ***Burners/SOFA at the BART-Subject Units in Utah.***

To determine cost effectiveness of the NO_x controls of SCR plus low NO_x burners and overfire air, one needs to project the expected emission reductions with the NO_x controls. The emissions reductions are the difference between baseline emissions and projected controls emissions in tons per year.

The BART Guidelines require the baseline emissions rate to "represent a realistic depiction of anticipated annual emissions" for the unit. 40 CFR Part 51, Appendix Y, Section IV.D.4.d.1. Further, for projecting emissions, typically capacity utilization should generally be based on past

capacity utilization. If future conditions will differ from past practice, the future operating conditions must be made into enforceable requirements. 40 CFR Part 51, Appendix Y, Section IV.D.4.d.2.

UDAQ and PacifiCorp chose to use 2001 to 2003 emissions data as the baseline. It must be noted that the use of annual average heat input from the 2001 to 2003 baseline period does not appear to be the most representative of future operations. First, some of the BART-subject units, mainly Hunter Unit 1, did not operate as much during 2001. In fact, during 2001-2003, all four BART subject units were operating well below the 90% capacity factor assumption of PacifiCorp's SCR cost analysis. Further, there have been many boiler modifications as well as turbine upgrades at all four of these BART units in the past seven years, the details of which are in permit applications and other documentations submitted to UDAQ. Given the myriad physical changes to each unit, it does not make sense to use historical capacity factors (i.e., historical heat input) to project emission reductions with the addition of SCR. Indeed, it is probably most appropriate to use a 90% capacity factor in projecting emission reductions for the cost analyses. However, to be consistent with the baseline period of the Utah regional haze plan, we used the 2001-2003 annual average heat input and capacity factor in these calculations of SCR plus LNB/OFA cost effectiveness. It is important to note that, had we used a more realistic, higher capacity factor for each unit, the costs per ton of NO_x removed would be lower than shown by our analyses.

To estimate controlled emissions based on capacity factor and the emission limit associated with the controls, we had to project annual heat input to the amount of coal in MMBtu/year necessary to produce the projected MW-hrs. To determine that, one needs to know each unit's heat rate, i.e., the amount of heat input to produce a unit of electricity – typically in the units of Btu/kW-hr. To ensure consistency between the NO_x BART cost analyses we completed for each unit and the CAMD data upon which baseline and future emissions projections were based, we calculated an annual average heat rate from CAMD data over the 2001-2003 baseline period.[343] With that heat rate, we projected annual heat input for future years and multiplied the annual heat input by the controlled NO_x emission rates. The assumed controlled NO_x emission rates for the low NO_x burners and overfire air were the NO_x emission limits set by UDAQ or those controls, or 0.26 lb/MMBtu. As discussed above, 0.05 lb/MMBtu was the assumed NO_x emission limit for the SCR plus low NO_x burners and overfire air control scenario.

Then, the emissions reduced under each NO_x control scenario were determined by subtracting the controlled emissions from baseline emissions for each unit.

Response: Similar to the state of Utah, EPA utilized actual heat input and emissions data from 2001-2003 to determine baseline emissions for the purpose of calculating emission reductions that are in turn used to calculate cost effectiveness. We disagree that the annual average heat input from the 2001-2003 baseline period is not representative of future operations for the BART EGUs. EPA analyzed the annual average heat input from 2001-2003 and found that it compares

[343] Specifically, we divided the gross MW-hours generated in a year by the annual heat input in MMBtu/yr, and converted it to Btu/kW-hr.

very well with the average heat input from the most recent five years, 2011-2015 (see the Table 1. below).[344]

Table 1.

Comparison of Heat Input - Utah BART EGUs			
Unit	2001-2003 Average (MMBtu)	2011-2015 Average (MMBtu)	Percent Difference (%)
Hunter 1	3.14E+07	3.03E+07	-3.6%
Hunter 2	3.15E+07	3.22E+07	2.2%
Huntington 1	3.14E+07	3.15E+07	0.4%
Huntington 2	2.99E+07	3.12E+07	4.2%

(Data Source: EPA Air Markets Program Data)

Using Hunter Unit 1 as the an example, the 2011-2015 annual average heat input is lower than that for 2001-2003, while the opposite is true for Hunter 2 and Huntington 1 and 2. In neither case is the difference significant, likely to change the cost effectiveness in an appreciable manner, or to affect our selection of BART under the FIP. Accordingly, we find that the 2001-2003 annual average heat input can be used to calculate baseline emissions that are a "realistic depiction of anticipated annual emissions" in accordance with the BART Guidelines.

In addition, we find that the commenter's use of an emission limit (0.26 lb/MMBtu) as the inlet rate to the SCR is likely to lead to an overestimate of the actual annual emissions reductions that can be achieved. This is because the emission limit represents a 30-day limit, as opposed to the actual annual emission rate. By contrast, in our cost analysis supporting this rulemaking, we have used recent actual annual emission rates as found in EPA' Air Markets Program Data. These rates, which range from 0.20 to 0.22 lb/MMBtu, are documented in the ATP report and associated spreadsheet located in the docket.

Comment: [Conserv Orgs -- Stamper Report, pp. 28-30]

Results of the Cost Analysis Using the Sargent & Lundy IPM SCR Cost Module.

The results of our SCR plus LNB/OFA cost analysis using the Sargent & Lundy IPM SCR cost module with the changes discussed above are provided in Table 6 below. We added in the costs of LNB/OFA for each unit provided by PacifiCorp in its August 2014 BART update in these cost effectiveness analyses to arrive at the cost effectiveness of SCR plus LNB/OFA from 2001 to 2003 baseline emission rates and capacity utilization.

[344] Refer to spreadsheet prepared by EPA titled "Hunter and Huntington annual emissions.xlsx" located in the docket.

Table 6. Cost Effectiveness of SCR Plus LNB/OFA at the Utah BART-Subject Units Based on the Sargent & Lundy IPM SCR Cost Module for SCR Costs and Based on PacifiCorp's Costs for LNB/OFA[99]

	Hunter 1	Hunter 2	Huntington 1	Huntington 2
NOx Emissions Reduced from 2001-2003 Baseline with SCR plus LNB/OFA	5,513 tpy	5,234 tpy	5,092 tpy	5,026 tpy
Cost Effectiveness of SCR (2011$)	$2,263/ton	$2,276/ton	$2,273/ton	$2,222/ton

[99] *See* SCR Plus LNB_OFA NO_x Control Cost Effectiveness Workbooks for Hunter 1 (Ex. 26), Hunter 2 (Ex. 27), Huntington 1 (Ex. 28), and Huntington 2 (Ex. 29).

As the above table demonstrates, use of the Sargent & Lundy IPM cost module for estimating SCR costs results in much lower capital costs and cost effectiveness values than projected by PacifiCorp. In Table 7 below, we provide our recalculations of costs from the PacifiCorp analyses (shown in Table 5 above) as well as our cost numbers using the Sargent and Lundy IPM cost module for comparison.

Table 7. Comparison of Costs and Cost Effectiveness for SCR Plus LNB/OFA Using Sargent & Lundy IPM Cost Module and Using Recalculated PacifiCorp Costs

	Recalculated PacifiCorp Total Capital Investment Costs for SCR (2011$)	Recalculated PacifiCorp Cost Effectiveness of SCR Plus LNB/OFA (2011$)	Sargent & Lundy IPM Module SCR Capital Costs for SCR (2011$)	Cost Effectiveness of SCR Plus LNB/OFA based on Sargent & Lundy IPM Module SCR Costs
Hunter 1	$155,679,581	$3,330/ton	$84,289,355	$2,263/ton
Hunter 2	$156,772,210	$3,491/ton	$81,012,625	$2,276/ton
Huntington 1	$157,579,534	$3,426/ton	$78,025,790	$2,273/ton
Huntington 2	$157,833,748	$3,327/ton	$74,012,376	$2,222/ton

The Sargent & Lundy IPM cost module capital costs of SCR are within the range of costs that has been found to be typical for SCR retrofits. Specifically, the capital costs calculated by the Sargent & Lundy IPM SCR cost module for the Hunter and Huntington units reflect a capital cost of approximately $150-175 per kW. However, the recalculated PacifiCorp capital costs are on the very high end of the range of typical capital costs for SCR retrofits, at approximately $320/kW. PacifiCorp's capital cost estimates without the recalculations discussed in Section I.B. above reflect capital costs of approximately $340 - $350/kW.

Six industry studies conducted between 2002 and 2010 have reported the installed unit capital cost of SCRs, or the costs actually incurred by owners, to range from **$84/kW** to **$447/kW** in 2010 dollars.

The first study evaluated the installed costs of more than 20 SCR retrofits from 1999 to 2001. The installed capital cost ranged from **$118/kW to $237/kW,** converted to 2011 dollars.[345] Costs are escalated using the Chemical Engineering Plant Cost Index ("CEPCI"). The second survey of 40 installations at 24 stations reported a cost range of **$84 to $270/kW**, converted to 2011 dollars.[346] The third study, by the Electric Utility Cost Group, surveyed 72 units totaling 41 GW, or 39% of installed SCR systems in the U.S. This study reported a cost range of **$132/kW to $291/kW**, converted to 2011 dollars.[347] A fourth study, presented in a course at PowerGen 2005, reported an upper bound range of **$200/kW to $225/kW**, converted to 2011 dollars.[348] This is the same study used above to test components of the Burns & McDonnell cost estimate. The costs for these units, converted to 2010 dollars, range from **$193/kW** to **$316/kW**.[349]

The 2010 Cichanowicz study included capital costs for over 50 SCR installations.[350] The costs in this updated study include both staff engineering and owners' engineering charges and financing charges, which are not allowed in an overnight cost analysis. These costs are reported in 2008 dollars and categorized into four discrete time periods to demonstrate the rising cost trend. The last time period is for SCRs built or under construction between 2008 and 2010. The highest reported value in this group is about **$447/kW** in 2011 dollars for an unidentified 400 MW unit. The overall range for these industry studies is $84/kW to $316/kW, with one outlier of $447/kW. The upper end of this range is for highly complex retrofits with severe space constraints, such as Cinergy's Gibson Units 2 - 4. Even the Gibson retrofit, in which the SCR was built 230 feet above the power station using the largest crane in the world,[351] only cost **$265/kW** in 2011 dollars.[352] Similarly, the Belews Creek SCR, one of the largest and most complex SCR retrofit

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[345] Bill Hoskins, Uniqueness of SCR Retrofits Translates into Broad Cost Variations, Power Engineering (May 2003). Available at http://www.powergenworldwide.com/index/display/articledisplay/176832/articles/power-engineering/volume-107/issue-5/features/uniqueness-of-scr-retrofits-translates-into-broad-cost-variations.html, and attached as Ex. 17. The reported range of $80 to $160/kW was converted to 2011 dollars using the ratio of CEPCI 2011 to 2002: 585.7/395.6.

[346] J. Edward Cichanowicz, Why are SCR Costs Still Rising?, Power (April 2004) (Ex. 54); Jerry Burkett, Readers Talk Back, Power, August 2004. Ex. 18. The reported range of $56/kW - $185/kW was converted to 2011 dollars ($79 - $254/kW) using the ratio of CEPCI for July 2010 to 1999 (585.7/390.6) for lower end of the range and 2011 to 2003 (585.7/401.7) for upper end of range, based on Figure 3.

[347] M. Marano, Estimating SCR Installation Costs, Power (January/February 2006). The reported range of $100 - $221/kW was converted to 2011 dollars using the ratio of CEPCI for 2011 to 2004: 585.7/444.2. Ex. 19.

[348] PowerGen 2005, Selective Catalytic Reduction: From Planning to Operation, Competitive Power College, by Babcock Power, Inc. and LG&E Energy, December 2005. The reported range of $160 - $180/kW) was converted to 2011 dollars using the ratio of CEPCI for 2011 to 2005 (585.7/468.2). Ex. 52.

[349] J. Edward Cichanowicz, Current Capital Cost and Cost-Effectiveness of Power Plant Emissions Control Technologies, p. 28-29, Figure 7-1 (June 2007). The reported range of $175 - $225/kW installed in 2006 was converted to 2011 dollars using the ratio of CEPCI for 2011 to 2006 (585.7/499.6). The 2009 value of $300/kW was converted to 2011 dollars using the ratio of CEPCI for 2011 to 2009 (585.7/521.9).
Ex. 20.

[350] J. Edward Cichanowicz, Current Capital Cost and Cost-Effectiveness of Power Plant Emissions Control Technologies, Section 6 (January 2010). The high point on Figure 6-1, which is reportedly in 2008 dollars was converted to 2011$ using the ratio of CEPCI for 2011 to 2008 (585.7/575.4). Ex. 3.

[351] Bob Ellis, Standing on the Shoulder of Giants, Modern Power Systems (July 2002). Ex. 21.

[352] McIlvaine, NO_x Market Update (August 2004), available at http://www.mcilvainecompany.com/sampleupdates/NoxMarketUpdateSample.htm. Ex. 22. SCR was retrofit on Gibson Units 2-4 in 2002 and 2003 at $179/kW. Assuming 2002 dollars, this was multiplied by the ratio of the 2011 CEPCI index to 2002 (585.7/395.6).

projects in the US, involved installing the SCR 280 feet above ground level above the boiler building. This retrofit only cost **$212/kW** in 2011 dollars.[353]

At $340 - $350/kW (2011$), PacifiCorp's capital costs of SCR are clearly on the high end of the range of typical costs per kW and even our recalculated PacifiCorp costs at $320/kW (2011$) are high compared to typical SCR installation costs. As previously stated our recalculated SCR plus LNB/OFA address the most obvious and readily addressed flaws in PacifiCorp's SCR cost analyses. Thus, our recalculated PacifiCorp costs in Table 5 above (reiterated in part in Table 7 above) likely represent the worst case costs for SCR retrofits at the Hunter and Huntington units. Our revised capital costs based on the Sargent & Lundy SCR IPM Cost Module are squarely within the range of typical costs for SCR retrofits.

Response: Comment noted. While we believe that the approach used by EPA to estimate SCR control costs for this rulemaking are more reliable than the approach used by the commenter (IPM control cost module), the resulting cost effectiveness values are similar. While the commenter estimates cost effectiveness ranges from $2,222/ton to $2,276/ton, EPA (revised) estimates of cost effectiveness ranges from in $2,657/ton to $2,928/ton. Our selection of BART, in consideration of the other BART factors, would be the same given either set of costs. In addition, EPA's revised capital costs, like those of the commenter, are well within the range of typical costs for SCR retrofits when expressed on a $/kW basis. Refer to the ATP report in the docket for details. Also, refer to other responses in this document related to costs expressed on a $/kW basis.

Comment: [Conserv Orgs -- Stamper Report, pp. 31-32]

The Cost Effectiveness of SCR Plus LNB/OFA Are Reasonable at Hunter 1 and 2 and Huntington 1 and 2.

Whether we rely on our recalculated PacifiCorp costs and cost effectiveness of SCR plus LNB/OFA or we rely on the cost effectiveness based on the Sargent & Lundy IPM SCR cost module, the costs to install these controls are clearly cost effective at all four BART-subject units in Utah. As shown in Table 7 above, the cost effectiveness of SCR plus LNB/OFA ranges from $2,200/ton to $3,500/ton in 2011 dollars. These costs are within the range of costs that EPA has required similar sources to bear to meet BART.

EPA Region IX has required SCR as BART for the Four Corners Units 1 - 5 to meet a NO_x limit of 0.11 lb/MMBtu at a cost effectiveness of $2,515/ton to $3,163/ton in 2008 dollars,[354] or $2,560/ton to $3,220/ton in 2011 dollars.[355] In its FIP for Montana, EPA found that the cost effectiveness of SCR controls for Colstrip Units 1 and 2 of approximately $3,200/ton per unit (in 2010 dollars), or $3,403/ton in 2011 dollars, was reasonable.[356] In its FIP for Arizona regional haze, EPA required SCR along with combustion controls to meet BART at the BART-subject

[353] Bill Hoskins, Uniqueness of SCR Retrofits Translates into Broad Cost Variation, PowerGen Worldwide (May 2003). Available at http://www.powergenworldwide.com/index/display/articledisplay/176832/articles/power-engineering/volume-107/issue-5/features/uniqueness-of-scr-retrofits-translates-into-broad-cost-variations.html. Ex. 23. Converted to 2011 dollars using the ratio of (585.7/402.0).

[354] *See* 75 FR 64227 (Oct.19, 2010); 77 FR 51620, 51621-22 (Aug. 24, 2012).

[355] Based on changes in the CEPCI indices for 2008 and 2011.

[356] *See* 77 FR 23988, 24026-7, 24034-5 (April 20, 2012).

coal-fired units at Apache, Cholla, and Coronado power plants at cost effectiveness values ranging from $2,275/ton to $3,472/ton.[357] EPA Region VIII proposed SCR as BART at the Leland Olds Unit 1, Milton R. Young Unit 1, and Milton R. Young Unit 2 at costs of $1,800/ton, $2,600/ton, and $2,700/ton in 2009 dollars (or $2,020/ton, $2,918/ton, and $3,030/ton in 2011 dollars), respectively.[358]

In its final action on the Wyoming regional haze plan, EPA found that costs for SCR plus low NO_x burners and overfire air ranging from $2,635/ton to $4,461/ton (2008 dollars) are reasonable to require SCR as BART at Naughton Unit 3, Dave Johnston Unit 3, and at Laramie River Units 1, 2, and 3.[359] These costs range from $2,682/ton to $4,541/ton in 2011 dollars. Moreover, the state of Arizona has stated that a cost effectiveness value of more than $4,489/ton of NO_x removed is cost effective.[360]

Thus, clearly the costs of SCR plus LNB/OFA, whether based on the Sargent & Lundy IPM SCR cost module or on our recalculated PacifiCorp cost estimates, are reasonable to justify requiring SCR plus low NO_x burners and overfire air to meet a 0.05 lb/MMBtu NO_x limit as BART at Hunter Units 1 and 2 and Huntington Units 1 and 2. Thus, it was appropriate for Utah to use these controls and 0.05 lb/MMBtu NO_x emission rate as reflective of the BART benchmark for the BART-subject units in Utah.

Response: We concur that the costs of SCR with combustion controls estimated by the commenter, which are comparable to those estimated by EPA, are reasonable compared to other BART determinations. We also concur that it was appropriate for Utah to use SCR + LNB/SOFA and a 0.05 lb/MMBtu NO_x emission rate (annual) as reflective of the BART benchmark for the BART-subject units in Utah.

We discuss comparisons with BART determinations for Cholla, Laramie River Station, Dave Johnston, and Colstrip in detail elsewhere. We briefly note here that the Colstrip and certain aspects of the Dave Johnston (i.e. Unit 4 and Unit 3 under an assumed 9 year remaining useful life) BART determinations were not comparable, but the Cholla, Laramie River Station, and Dave Johnston Unit 3 (under an assumed 20 year remaining useful life) were comparable and support our BART determination.

We do not rely on any comparison with our proposed BART determinations for Leland Olds Unit 2 and Milton R. Young Units 1 and 2, as those proposals were not finalized. However, the commenter is correct that those proposals were generally consistent with our BART determination here for the Hunter and Huntington BART units, although we are not examining those proposals in detail as they were not finalized.

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[357] 77 FR 42834, 42857, 42860, 42862 (July 20, 2012).
[358] *See* 76 FR 58570, 58599 (Sept. 21, 2011). While EPA did not ultimately require SCR as BART for these North Dakota EGUs in its final regional haze action, EPA's decision was based on whether SCR was technically feasible for these lignite-fired units and not based on costs of controls. *See* 77 FR 20894, 20897-98 (April 6, 2012).
[359] 79 FR 5032, 5039-43 (Jan. 30, 2014).
[360] Letter from Arizona Department of Environmental Quality to Steve Fry, EPA Region IX, Re: Consultation Regarding Best Available Retrofit Technology Analyses for the Four Corners Power Plant and Navajo Generating Station, May 12, 2008. Ex. 25.

We now discuss the comparison with the remaining BART determinations mentioned by the commenter: Four Corners, Apache, and Coronado. While the commenter primarily discusses average cost-effectiveness of SCR with combustion controls, we will examine both average and incremental cost-effectiveness of SCR + LNB/SOFA and total visibility benefits of SCR + LNB/SOFA.

For Arizona Electric Power Company's Apache Generating Station, Units 2 and 3, EPA finalized a FIP BART emission limit of 0.07 lb/MMBtu, 30-day rolling average, averaged across the two units.[361] EPA determined that BART consisted of SCR + LNB/OFA. The average cost-effectiveness of SCR + LNB/OFA at Units 2 and 3 was $2,908/ton and $2,275/ton, respectively, and the incremental cost-effectiveness relative to SNCR + LNB/OFA was $3,881/ton and $2,754/ton, respectively. 77 FR 42856-57, Tbl. 16. The average cost-effectiveness numbers are in line with the Hunter and Huntington BART units, for which the average cost-effectiveness ranges from $2,697/ton to $2,928/ton. The incremental cost-effectiveness is generally lower for Apache, as the incremental cost-effectiveness for SCR + LNB/SOFA as compared to SNCR + LNB/SOFA at the Hunter and Huntington BART Units ranges from $5,830/ton to $6,632/ton. It should be noted, though, that we assumed an annual emission rate of 0.16 to 0.17 lb/MMBtu for SNCR + LNB/SOFA at the Hunter and Huntington units, as compared to the 0.18 to 0.22 lb/MMBtu assumed for SNCR + LNB/OFA at the Apache units, while both actions assumed 0.05 lb/MMBtu for SCR + LNB/[S]OFA. All other things being equal, this increases the incremental cost-effectiveness values of SCR + LNB/SOFA at the Hunter and Huntington units relative to the Apache units. In addition, as discussed elsewhere we have made a number of conservative assumptions (catalyst replacement frequency, catalyst volume, and SCR reactor design) in our cost estimates. And in any case, that a control option is very cost-effective at one value does not mean that it ceases to be cost-effective at a higher value. That is, the incremental cost effectiveness of SCR + LNB/SOFA at Hunter and Huntington are reasonable despite being higher than the corresponding values at Apache. This is shown by other comparisons, such as with Laramie River Station and Hayden Station.

On the other hand, the visibility improvement from SCR + LNB/SOFA at Hunter and Huntington is generally higher than at Apache. At the three most impacted Class I areas, the visibility benefits of SCR + LNB/SOFA for the BART source as a whole range from 2.403 to 3.848 dv, while for Apache the visibility benefits for the BART source as a whole at the three most impacted Class I areas range from 1.16 to 1.59 dv.[362] 77 FR 42858, Tbl. 17. The visibility benefits of SCR + LNB/SOFA for Hunter and Huntington at the least impacted Class I area, Zion NP, is 0.594 dv for Hunter and 0.609 dv for Huntington. This is greater than the visibility benefits of SCR + LNB/OFA at Apache at four impacted Class I areas. We also note that Apache impacts the same number of Class I areas (nine) as Hunter and Huntington.

[361] 77 FR 72512, 72514/3 (Dec. 5, 2012). EPA approved the State's BART determination for Apache Unit 1, which consisted of LNB, FGR, and use of natural gas as fuel.

[362] As explained in the notice for this action, EPA interprets the BART Guidelines to require consideration of visibility improvement from application of BART to the BART source as a whole. EPA (and States) may at their discretion also consider the per-unit visibility improvement from application of BART to that unit. In the Arizona action, EPA did not (and was not required to) consider the per-unit visibility improvement for Apache. Thus, we compare the source-wide visibility improvement values here.

Thus, SCR + LNB/SOFA at Hunter and Huntington provides greater visibility improvement than SCR + LNB/OFA at Apache, for generally the same average cost-effectiveness but somewhat higher incremental cost-effectiveness. In balance, we find that the Apache BART determination is reasonably comparable and provides support for our BART determination here.

For Salt River Project's Coronado Generating Station, Units 1 and 2, EPA finalized a BART limit of 0.065 lb/MMBtu, 30-day rolling average, averaged across the two units. 77 FR 72515. As a result of a consent decree entered into between the U.S. and Salt River Project to resolve alleged PSD violations, Salt River Project had to install LNB/OFA on both units, on one unit by June 1, 2009, and the other by June 1, 2011, and in addition had to install SCR on one unit by June 1, 2014. Consent Decree, Doc. No. 18, Civ. No. 08-1479-PHX-JAT, ¶¶ 41, 42 (D. Az. 2008). The LNB/OFA had to achieve 0.320 lb/MMBtu, 30-day rolling average, and the SCR + LNB/OFA had to achieve 0.08 lb/MMBtu, 30-day rolling average. *Id.*

Since the LNB/OFA on Unit 1 were installed pursuant to a consent decree to meet other CAA requirements, EPA chose a post-installation baseline for Unit 1. Because the owner planned to meet the consent decree requirements by installing SCR (as well as the required LNB/OFA) at Unit 2, EPA chose to use the federally enforceable 0.080 lb/MMBtu limit as a realistic projection of anticipated emissions. 77 FR 42861/3. This is consistent with our position on existing controls as explained elsewhere in this response to comments. For Unit 2, EPA only proposed to tighten the NO_x limit from the federally enforceable 0.080 lb/MMBtu to 0.050 lb/MMBtu. As the installation of SCR was already assumed for Unit 2, it is not comparable to the situation for the Hunter and Huntington Units. We therefore focus on Unit 1, for which EPA determined that BART was SCR + LNB/OFA. For Unit 1, the average cost-effectiveness of SCR + LNB/OFA was $2,405/ton and the incremental cost-effectiveness relative to SNCR + LNB/OFA was $2,212/ton. This average cost-effectiveness is slightly less than for the Hunter and Huntington units, while the incremental cost-effectiveness is significantly less. However, EPA assumed an emission factor of 0.21 lb/MMBtu for SNCR + LNB/OFA at Coronado Unit 1, compared with the lower emission factors of 0.16-017 lb/MMBtu for SNCR + LNB/SOFA at Hunter and Huntington. All other things being equal, this increases the incremental cost-effectiveness of SCR + LNB/SOFA at the Hunter and Huntington units relative to the Coronado Unit 1. In addition, as discussed elsewhere we have made a number of conservative assumptions (catalyst replacement frequency, catalyst volume, and SCR reactor design) in our cost estimates. And in any case, that a control option is cost-effective at one value does not mean that it ceases to be cost-effective at a higher value.

On the other hand, the per-unit visibility improvement from SCR + LNB/OFA at Coronado Unit 1 ranges across 16 impacted Class I areas from 0.06 dv to 0.60 dv. 77 FR 42863-64, Tbl. 23. In comparison, the per-unit visibility improvement from SCR + LNB/SOFA at the Hunter and Huntington Units at the most impacted Class I area ranges from 1.250 to 1.851 dv, two to three times as much as for Coronado Unit 1, and the smallest improvement is 0.262 dv (for Hunter Unit 2 at Zion NP), four times the smallest for Coronado Unit 1. See Tbls. H.5 - .8, Air Quality Modeling Protocol: Utah Regional Haze Federal Implementation Plan, EPA-R08-OAR-2015-0463-0012. Thus, although Coronado Unit impacts 16 Class I areas and the Hunter and Huntington units 9 Class I areas, the per-unit benefits are considerably more for Hunter and Huntington.

Thus, SCR + LNB/SOFA at Hunter and Huntington provides somewhat greater visibility improvement than SCR + LNB/OFA at Coronado Unit 1, for slightly higher average cost-effectiveness, and for significantly higher incremental cost-effectiveness. In balance, we find that the Coronado Unit 1 BART determination is reasonably comparable and provides support for our BART determination here.

Finally, for the Four Corners Power Plant (FCPP), EPA considered as control options SCR + LNB/OFA, followed by SCR alone, and SNCR alone. 75 FR 44621, 64225. However, EPA determined that LNB/OFA was not likely to be an effective control technology at FCPP due to the inherent limitations of the existing boilers on all units. Thus, EPA rejected SCR + LNB/OFA and started a "top-down" analysis with SCR alone. The average cost-effectiveness of SCR at the five units ranged from $2,515/ton to $3,163/ton. Id. at 64227, Tbl. 2. In response to comments, EPA determined the incremental cost-effectiveness of SCR relative to SNCR (again noting that combustion controls would not be effective) as $2,500/ton to $3,300/ton. 77 FR 51620, 51624-25. The average cost-effectiveness of SCR at the FCPP units is in line with the average cost-effectiveness of SCR + LNB/SOFA at the Hunter and Huntington units, while the incremental cost-effectiveness of SCR relative to SNCR at the FCPP units is somewhat less than the incremental cost-effectiveness of SCR + LNB/SOFA relative to SNCR + LNB/SOFA at the Hunter and Huntington Units. As discussed elsewhere we have made a number of conservative assumptions (catalyst replacement frequency, catalyst volume, and SCR reactor design) in our cost estimates. And in any case, that a control option is cost-effective at one value does not mean that it ceases to be cost-effective at a higher value.

The visibility improvements from SCR at the five FCPP units, on a source-wide basis, ranged from 0.64 dv to 2.81 dv, across the 16 impacted Class I areas. 75 FR 64229, Tbl. 3. This is comparable with the improvements of 0.594 dv to 3.039 dv, on a source-wide basis, at the 9 Class I areas from SCR + LNB/SOFA at the Hunter and Huntington units. As a whole the visibility improvements from controls at FCPP impact more Class I areas than from Hunter and Huntington. FCPP is an extreme case in terms of visibility benefits, though, and that the most stringent level of control was warranted at FCPP does not mean that the most stringent level of control is not warranted at the Hunter and Huntington units merely because the facilities impact fewer Class I areas. Thus, on balance FCPP is not quite as close a match as some of the other comparisons, but it still offers support for our determination.

Comment: [Conserv Orgs -- Stamper Report, p. 59]
Based on my own independent analysis of the costs of LNB/SOFA/SCR presented in Section I.A.2. above and based on a review of EPA's cost analyses, I agree with EPA's finding that these controls are cost effective.

Response: Comment noted.

Comment: [Conserv Orgs -- Stamper Report, p. 60]
EPA made adjustments to PacifiCorp's capital costs for many of the same issues that I addressed in my amendments to PacifiCorp's LNB/OFA/SCR cost analyses presented in Section I.A.1. of this report. I incorporate by reference those comments and analyses here regarding EPA's revisions to PacifiCorp's capital cost analyses for EPA to consider. In particular, one comment

that it appears was not addressed by EPA was that PacifiCorp calculated SCR costs assuming operation at 90% capacity factor. However, the tons per year of NO_x removed were based on capacity factors lower than 90%, based on the capacity factor that the units were operating at in 2001-2003. One way to address this is to calculate emissions reductions based on operating at 90% capacity factor, which I did at Table 5 above.

Response: Comment noted. However, we disagree with the use of a 90% capacity factor for both calculating costs and in estimating emission reductions. Instead, consistent with the BART Guidelines, we believe it is appropriate to conduct the cost analysis based upon an assumption of continuation of past practice. That is, a source's past practice, particularly in the most recent years, is the best indicator of future operation. Therefore, we have used the actual capacity factor for each of the units for the time period 2001-2003 for this purpose, as opposed to a nominal capacity factor such as 90%. As we have discussed elsewhere, the heat input of the units (as it relates to the capacity factor) for 2001-2003 is very similar to what it has been in recent years, and is therefore a good projection of future operation.

Comment: [Conserv Orgs -- Stamper Report, p. 60]
EPA assumed a 20-year life for the SCR equipment in the NO_x BART analysis. As discussed above in Section I.A.2.c) of this report, which is incorporated by reference in these comments on EPA's proposed BART FIP, the lifetime of an SCR is at least 30 years. Thus, by assuming a 20-year life of the SCR, EPA was being conservative and its annualized capital costs for SCR are thus higher than the annual costs that will actually be incurred if these SCRs are installed.

Response: EPA agrees with commenter that 20 years is a conservative assumption. Refer to our response elsewhere in regard to the equipment life of SCR.

Comment: [Conserv Orgs -- Stamper Report, p. 60]
As discussed in Section I.A.3. of this report, which is incorporated by reference into these comments on EPA's proposed BART FIP, the costs of LNB/SOFA/SCR at Hunter Units 1 and 2 and Huntington Units 1 and 2 are reasonable, whether based on my recalculation of PacifiCorp's cost effectiveness analyses or my independent calculation of cost effectiveness presented in Sections I.A.1. and 2. of this report or whether based on EPA's calculations of cost effectiveness presented in the January 14, 2016 Utah regional haze proposed rulemaking. The costs are similar to the costs that other similar sources have been required to bear to comply with regional haze requirements.

Response: As noted elsewhere in this document, the cost effectiveness calculated by EPA for the Utah BART EGUs, when considered along with the other BART factors, supports a conclusion that SCR is a reasonable BART selection. And as also discussed elsewhere in this document, this is true when compared with other similar sources that have been required to install BART.

Comment: [S&L, pp. 2-3] These $/kW costs can be very misleading, especially for plants like Hunter and Huntington, which are located at high elevations of 5,680 feet and 5,790 feet, respectively. At higher elevations the resulting flue gas volumes are higher than a similar sized plant at lower elevations. At the elevation of each of these plants, the flue gas volume would equate to approximately 23 to 24 percent more gas volume than an equivalent MW boiler at sea

level. Table 1 compares the capital costs for the SCR systems reported in the 2014 BART Report to the Andover Report and shows the $/kW, corrected for elevation.

Table 1: SCR Total Capital Investment (TCI) of *2014 BART Report* and *Andover Report*

	Hunter 1	Hunter 2	Huntington 1	Huntington 2
Nominal MW (gross)	450	450	450	450
Nominal MW (gross) from *Andover Report*	446	430	461	450
Equivalent MW (gross)[4]	554	554	558	558
***2014 BART Report* LNB/OFA + SCR TCI**	$180,791,743	$177,482,372	$176,287,506	$176,517,450
***2014 BART Report* LNB/OFA TCI**	$11,586,773	$8,872,212	$8,325,049	$8,562,067
***2014 BART Report* SCR Only TCI[5]**	$169,204,970	$168,611,160	$167,962,457	$167,955,383
***2014 BART Report* $/kW (SCR Only)[6]**	**$305**	**$304**	**$301**	**$287**
***Andover Report* LNB/OFA + SCR TCI[7]**	$110,338,801	$108,111,901	$107,805,353	$109,428,725
***Andover Report* SCR Only TCI[5]**	$98,752,028	$99,495,445	$99,720,288	$100,040,436
***Andover Report* $/kW (SCR Only)[6]**	**$178**	**$180**	**$179**	**$179**

[4] Increases MW by 23 and 24% to consider elevations of Hunter (5,680 feet) and Huntington (5,790 feet)
[5] *See,* Andover_ NO_x_control_costs, _October_22, _2015.xlsx worksheet "NO_x - SCR_$ton,"at row 56."
[6] Calculated by dividing the "SCR Only TCI" by the Equivalent MW
[7] Calculated by adding Andover costs. *See,* Andover_ NO_x_control_costs, _October_22, _2015.xlsx worksheet "NO_x – LNB," at row 32 and "NO_x -SCR_$ton," at row 56.

Response: EPA disagrees with the commenter. The capital cost of controls are routinely compared on the basis of $/kW, as evidenced by Figure 1 in Attachment 5 of the PacifiCorp comments by Sargent & Lundy which was taken from a report prepared for the Utility Air Regulatory Group (UARG). Clearly, UARG believes that comparisons using $/kW are relevant, as does Sargent & Lundy because they included this figure in their report. Contrary to what Sargent & Lundy states in Attachment 5 of the PacifiCorp comments,[363] the UARG data was data reported from industry *without* taking into account elevation or other aspects of the project that would impact the difficulty or cost.[364] In any event, as clearly evidenced from that figure, the costs of SCR, expressed in terms of $/kW cover a wide range, indicating that facility capacity is only one of the factors that impact project cost. Other factors that impact cost, as described in the UARG document, are associated with the relative difficulty of retrofitting SCR at different sites.

[363] PacifiCorp comments, Attachment 5, page 4.
[364] Telephone conversation between ATP and the author of the UARG report, J. Edward Cichanowicz, 3/23/16.

EPA agrees with commenter that elevation plays a role in impacting cost, and as described in more detail in this response to comments relative to direct capital costs, this was taken into account in EPA's estimation of cost, which per the Guidelines were computed as cost-effectiveness values, in $/ton, rather than $/kw.

Comment: [S&L, pp. 3-4] Andover claims that, "historical industry cost data were considered to determine if the costs were reasonable in the context of what has been reported at other facilities;"[365] however, the data they analyzed are primarily from the early 2000s, with the most recent data being from a single project in 2007 and a single project in 2013.[366] Andover then incorrectly used the Chemical Engineering Process Cost Indexes (CEPCI) to escalate all of the project costs from the year reported to 2014.[367]

The CEPCI composite index is updated monthly in Chemical Engineering Magazine. The composite index is built from four sub-indexes (Equipment, Construction Labor, Buildings, and Engineering & Supervision), and seven equipment component sub-indexes (e.g., process machinery, pipe, valves & fittings, electrical equipment, etc.). Although the CEPCI indexes are commonly used in industry to escalate project costs on a year-to-year basis, there are limitations to its use. One of the most important limitations is the general industry standard that the composite CEPCI index should not be used to escalate costs beyond 5-years.[368] Beyond the 5-year window, cost indexes may not accurately reflect changes in relative weighing-factor of the underlying costs, such as fabricated equipment prices, labor costs and productivity, and commodity pricing. Studies have found that beyond a period of 5- years, the differences between actual prices of equipment and labor and those predicted by a cost index become too great to provide meaningful budgetary cost estimates.[369] Therefore, only the 2013 data utilized by Andover can be escalated and used for a meaningful comparison. The 2013 data point was reported by Andover to be $420/kW, which is well above the costs estimated by both Andover and S&L for the PacifiCorp Utah units.

Response: We disagree that ATP improperly used the Chemical Engineering Plant Cost Index (CEPCI) to escalate past SCR costs and should have limited use to escalation over a period of 5 years or less. EPA acknowledges that ideally the CEPCI should be used to escalate costs over as few years as possible. However, with regard to use of CEPCI in escalating cost from the early 2000's, this is a common practice when representative, or approximate cost estimates are of interest. For example, Sargent & Lundy utilized costs escalated with the CEPCI for much longer periods than five years in developing cost estimates for SCR to be used in the Integrated Planning Model.[370] This Sargent & Lundy report developed for EPA utilized cost data from "ANALYSIS OF MOG AND LADCO'S FGD AND SCR CAPACITY AND COST ASSUMPTIONS IN THE EVALUATION OF PROPOSED EGU 1 AND EGU 2 EMISSION

[365] *See* Andover Technology Partners, Cost of NO_x BART Controls on Utah EGUs to: EC/R Inc., p.7 (May 13, 2016) (hereinafter "Andover Report"). Andover Technology Partners is a subcontractor to EC/R Incorporated.
[366] *See,* Andover_NOx_control_costs,_October_22, 2015.xlsx worksheet "TVA_SCR Cost," at column D.
[367] *Id.*, at Column G.
[368] *See* Vatavuk, W., "Updating the CE Plant Cost Index," Chemical Engineering, 62, 66 (Jan. 2002).
[369] *Id.* at 66.
[370] IPM Model – Revisions to Cost and Performance for APC Technologies SCR Cost Development Methodology FINAL August 2010 Project 12301-007.

CONTROLS"[371] This report, in turn, used data from three sources, one with a cost basis of 2002 (Hoskins)[372], one with a cost basis of 2003 (Cichanowicz)[373], and one with a cost basis of 2005 (Marano)[374]. The Hoskins study included projects going back to 1999. According to Sargent & Lundy, who used this data that included projects going back to 1999 in work for EPA to develop cost algorithms for SCR:

> "The data sets were escalated to update the MOG information to 2009 and all of the data was cross referenced with current 2009 projects. The MOG and S&L cost data were updated to reflect the changes in equipment and labor rates. The CEPCI index for power plants was used to escalate the costs. The Handy-Witman index was also used to escalate the project costs to account for regional effects; the results were compared with the CEPCI index and were within 2% for total project costs."[375]

Therefore, Sargent & Lundy has used the same approach for escalating costs as used by ATP to develop cost estimates of SCR systems – adjusting for cost over a 10 year span from 1999 to 2009. This is not an unreasonable approach to use if the accuracy requirement is not high, such as in a study-level estimate of costs for regulatory purposes. If the need for accuracy is very high, such as for a contractor's bid, escalation of cost using the CEPCI over a long period would not be performed. This is why ATP did not utilize the CEPCI in this manner for adjusting costs for PacifiCorp's BART analysis but simply for escalating the costs of other projects to arrive at approximate representative costs for those projects.

Comment: [S&L, pp. 4-5] The UARG document, referred to in the Andover Report, includes a much more comprehensive and recent sample of SCR retrofit costs in the United States. Figure 1 reproduces the SCR costs reported in the UARG document, but the graph has been annotated to compare the "SCR only" cost range for PacifiCorp's Utah units, provided by S&L in the *2014 BART Report*, to that provided in the Andover Report, and as summarized in Table 1. The cost ranges identified on Figure 1 for the S&L and Andover costs are based on the equivalent boiler size at sea level and not the actual boiler size (i.e. MW sizes have been increased by ~20% to reflect the higher gas volumes for these units based on their elevations), just as was done above in Table 1. S&L's cost estimates were performed in 2011 and are based on costs from 2011. Andover's costs were developed by adjusting S&L's cost estimates, and are therefore also based on a 2011 dollar basis. When analyzing the most recent UARG reported SCR costs installed between 2008 and 2010, it can be seen that only a single data point from this period is below the Andover costs, while the S&L costs are well within the overall range of this data. In addition, the costs presented in Figure 1 are on a 2008 dollar basis and have not been adjusted to consider

[371] Final Report ANALYSIS OF MOG AND LADCO'S FGD AND SC R CAPACITY AND COST ASSUMPTIONS IN THE EVALUATION OF PROPOSED EGU 1 AND EGU 2 EMISSION CONTROLS Prepared for Midwest Ozone Group Prepared by James Marchetti J. Edward Cichanowicz January 19, 2007, see page 16.
[372] Hoskins, B., et al., "Uniqueness of SCR Retrofits Translates Into Broad Cost Variations", Power Engineering, May, 2003.
[373] Cichanowicz, J.E., Why are SCR Costs Still Rising, Power Magazine (April, 200)4.
[374] Marano, M., et al., Estimating SCR Installation Costs, Power Magazine (Jan. 2006).
[375] IPM Model – Revisions to Cost and Performance for APC Technologies SCR Cost Development Methodology FINAL August 2010 Project 12301-007.

escalation of capital costs from 2008 to 2011 which would further increase the discrepancy between the Andover costs to the recent SCR project costs reported by UARG.

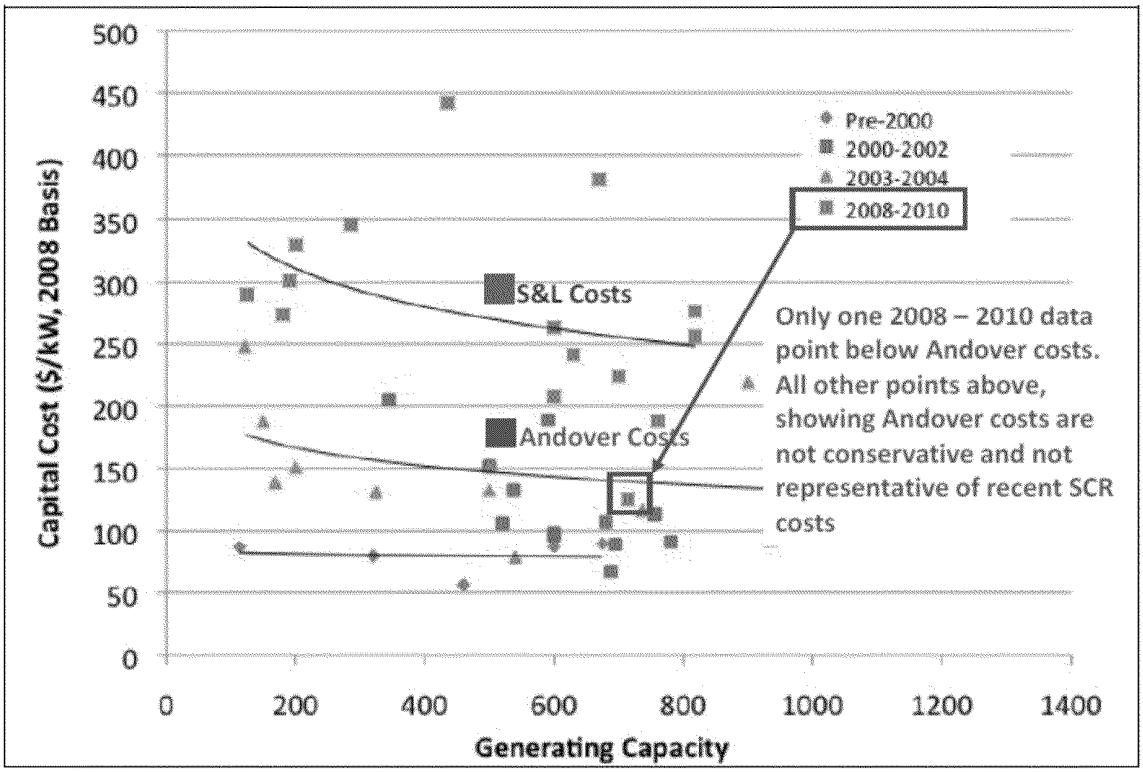

Figure 1: UARG SCR Costs Annotated with S&L and Andover Costs for Hunter / Huntington [13]

[13] *See*, Cichanowicz, J. E., "Current Capital Cost And Cost-Effectiveness Of Power Plant Emissions Control Technologies", Prepared for Utility Air Regulatory Group, January 2013, Figure 6-1, at pg. 6-2.

Andover claims repeatedly in their report that they made conservative assumptions and that their costs are more reflective of costs to retrofit SCR systems at Hunter and Huntington stations than S&L's estimates.[376] However, Figure 1 clearly shows that Andover's costs are neither conservative nor do they compare well to industry data for recent SCR projects.

Response: EPA disagrees. Since the costs developed for UARG cannot be examined, it is not possible to determine if they were developed in a manner that is consistent with the 2002 CCM. Moreover, as noted earlier in this response to comments, adjustments were not made to the UARG data to account for altitude. As such the data as presented by Sargent & Lundy with an adjustment for altitude is inconsistent with the data from UARG. Nevertheless, EPA's revised estimate of SCR costs results in capital costs of $267/kW for Hunter 1, $279/kW for Hunter 2, $261/kW for Huntington 1, and $268/kW for Huntington 2. These costs are roughly in the middle of the range shown in the data from UARG for the most recent period of time shown on

[376] *See*, *Andover Report*, at pgs. 14, 16, 17, 18, and 19.

the graph. Thus, the graph tends to support (with the caveat that we are unable to determine that the costs were developed appropriately) our revised cost estimates.

Comment: [S&L pp. 6-7] Process Contingency

Andover Report: For SCR applications on utility boilers burning US western bituminous coals there should not be a need for process contingency.[377]

S&L Response:

Andover's claims that process contingency is not required are arbitrary and have no basis. We agree with Andover's clarification that commercially available technology process contingency could range from 0 – 10%.[378] In this case, S&L followed the *Control Cost Manual*'s specific SCR example of 5% process contingency[379], which is an intermediate value from the possible range cited in Andover's reference. While Andover is correct that there is significantly more experience with SCR technology in the United States, PacifiCorp's Bridger Station Unit 3, which was commissioned in December of 2015 is, according to S&L's knowledge, the first SCR in the United States to be installed on a unit that fires these unique western bituminous coals. In addition, to date, S&L is not aware of any such SCR systems firing the Utah-specific coals fired at Hunter and Huntington. Later in its analysis, Andover correctly notes that the coal chemistry is different than eastern bituminous, Pennsylvania bituminous, and PRB [Powder River Basin] fuels, which demonstrates the uniqueness of these Utah fuels.[380] Andover also summarizes average deactivation rates provided by one catalyst supplier that do not include deactivation rates for Western Bituminous fuels, further illustrating that there is no current experience with these coals.[381]

There have also been several industry publications citing the potential for vapor-phase phosphorous poisoning of catalyst for deeply staged burners, consistent with the types of Low NO_x burners and over-fired air systems that are in place at the Hunter and Huntington units.[382,383] Industry data regarding phosphorous poisoning has varied significantly and has been found to depend on the amount of phosphorous that is converted to vapor phase, which is very difficult to measure. Therefore, it was appropriate for S&L to include 5% process contingency, as allowed by the *Control Cost Manual,* to account for the uncertainty associated with the SCR design due to firing these unique western bituminous coals and the potential for vapor-phase poisoning, a recent phenomenon that is not yet fully understood.

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[377] *See, Andover Report*, at pg. 8.
[378] *Id.* at p. 7.
[379] *See EPA Air Pollution Control Cost Manual, EPA/452/B-02-001, Section 4, at 2-44, Table 2.5 (January 2002), available at https://www3.epa.gov/ttncatc1/dir1/c_allchs.pdf.*
[380] *See*, *Andover Report*, at pg. 12.
[381] *See*, *Andover Report*, Table 3 at pg. 15.
[382] *See*, M Gadgil, "Deactivation of Selective Catalytic Reduction (SCR) Catalyst by Phosphorus: Proposed Mechanism and Solution," Presented at the International Pittsburgh Coal Conference, September 12 – 15, 2011.
[383] *See*, M Gadgil et al, "Combustion Additives for Control of Phosphorus Effects and Achieving Mercury Reduction," Presented at Power-Gen Europe, June 3 – 5, 2014.

Response: EPA disagrees with the commenter. The American Association of Cost Engineers (AACE) cost guidelines that the 2002 CCM is based upon allow for process contingency for commercially offered technologies to be in the range of 0% to 10%.[384, 385] Five percent, as indicated in the 2002 CCM, is the midpoint of this range. According to AACE 16R-90,[386]

> "The process contingency factor is applied in an effort to quantify the uncertainty in the technical performance due to limited design data."

The design data for these existing units – gas flowrates and concentrations, emission requirements, coal to be used, and other characteristics are well known at this point. Therefore, data limitations on design data really do not exist. Further, according to the Department of Energy's National Energy Technology Laboratory,[387]

> "Process contingency is intended to compensate for uncertainty in cost estimates caused by performance uncertainties associated with the development status of a technology. Process contingencies are applied to each plant section based on its current technology status."

As noted in ATP's report,[388] use of SCR today is extremely mature – far more mature than it was in 2002 when the CCM was issued. Figure 1 shows the cumulative installed capacity of coal fired utility boilers equipped with SCR systems.[389] As shown, the installed capacity of SCR on coal power plants is today about ten times what it was when the 2002 CCM was issued. As such there was very little experience with SCR on coal fired boilers in the US at the time of the 2002 CCM. Today, there is much more experience with many facilities having over a decade of operating experience.

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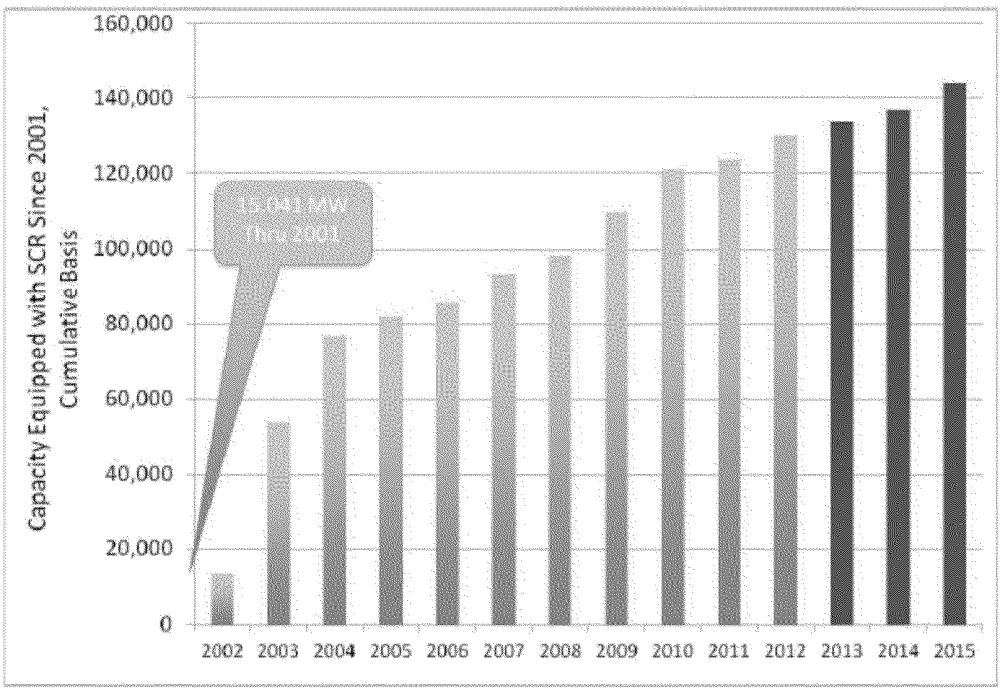
[384] AACE International Recommended Practice No. 16R-90, CONDUCTING TECHNICAL AND ECONOMIC EVALUATIONS –AS APPLIED FOR THE PROCESS AND UTILITY INDUSTRIES.
[385] US Department of Energy, National Energy Technology Laboratory, "Quality Guidelines for Energy System Studies, Cost Estimation Methodology for NETL Assessments of Power Plant Performance", DOE/NETL-2011/1455.
[386] AACE International Recommended Practice No. 16R-90 CONDUCTING TECHNICAL AND ECONOMIC EVALUATIONS – AS APPLIED FOR THE PROCESS AND UTILIT Y INDUSTRIES.
[387] US Department of Energy, National Energy Technolog y Laboratory, "Quality Guidelines for Energy System Studies, -Cost Estimating Methodology for NETL Assessments of Power Plant Performance", DOE/NETL-2011/1455, April 2011, pg 4.
[388] Andover Technology Partners, "Cost of NOx BART Controls on Utah EGUs", October 22, 2015, pp 7-8.
[389] Cichanowicz, J. E., "CURRENT CAPITAL COST AND COST- EFFECTIVENESS OF POWER PLANT EMISSIONS CONTROL TECHNOLOGIES", Prepared for Utili ty Air Regulatory Group, January 2013.

Figure 1. Coal fired utility boiler capacity with SCR (from Cichanowicz, 2013)



Thus, the status of SCR technology in the United States today is very mature. Catalyst suppliers also supply catalyst on a global basis and are familiar with the effects of a wide range of coals with a wide range of materials that deactivate the catalyst. Therefore, the uncertainty in the performance of the SCR system at this point is much lower than it was in 2002, and the Process Contingency should therefore be significantly reduced from what it was in 2002.

The primary concern that relates to performance uncertainty is with regard to how quickly the catalyst will deactivate. The deactivation rate impacts how much catalyst must be initially installed to achieve adequate performance at a point in the future. Catalyst deactivation is primarily impacted by the various deactivating species that may be present in the coal. ATP examined and compared the concentrations of species that deactivate the catalyst for the Utah coals in question against concentrations for US coals that are very well known (see ATP report page 12) and concluded that the Utah coals had qualities that were favorable when compared to these other coals.

Sargent & Lundy (S&L, page 6 of Attachment 5 of PacifiCorp comments) states that they are unaware of any experience with SCR with the Utah-specific coals fired at Hunter and Huntington, which indicates that they have some uncertainty about how these coals should deactivate SCR catalyst when compared to other coals. However, Sargent & Lundy does not state that they examined the concentration of any deactivating species that may be present in the coal, as was done by ATP. They only raise this as an uncertainty without any further analysis.

As part of PacifiCorp's comments, Sargent & Lundy raised the concern about phosphorus deactivation that has been experienced for some plants firing Powder River Basin (PRB) coals (S&L, page 6 of Attachment 5 of PacifiCorp comments), but did not examine the phosphorus content of the Utah coals. Examination of USGS coal quality database[390] data shows phosphorus in the ash in Utah coals to be lower than for PRB coals, especially when compared on a heating value basis. Even so, the sources S&L cites also describe mitigation methods that are effective at addressing this issue should they be necessary.[391] The mitigation method entails addition of iron-bearing material to the fuel that will convert gaseous phosphorus to particle phosphorus and thereby avoid the catalyst deactivation from gaseous phosphorus.[392] If this additive were necessary (and, it may not be), it would entail addition of material onto the coal. The equipment would amount to nothing more than a storage silo and pneumatic or other device to put the material onto the coal while it is being transported on the coal belt.[393, 394] The cost of such equipment, if needed, is minimal, and would be well below the 5% Process Contingency that PacifiCorp believes may potentially be necessary to address this.

This determination to disallow Process Contingency is also consistent with a previous EPA determination regarding use of Process Contingency in BART cost estimates for SCR.[395]

Comment: [S&L, pp 7-9] Project Contingency

Andover Report: Project Contingency of 15% is too high in light of the cost method used and very conservative underlying assumptions. No additional project contingency is allowed.[396]

S&L Response:

We agree with the Andover report that the cost estimating methodology described in the *Control Cost Manual* is designed to provide "study level" cost estimates, which the manual states are "nominally accurate to within +30%."[397], and are "acceptable for regulatory development."[398] In addition we agree that these were adapted from standards developed by the American Association of Cost Engineers (AACE). However, Andover incorrectly classifies S&L's cost estimates as either Class 1 or Class 2 because they have "hundreds of line items and input parameters." The AACE defines estimate classes based upon the level of project definition,

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[390] http://ncrdspublic.er.usgs.gov/coalqual/.
[391] M Gadgil, "Deactivation of Selective Catalytic Reduction (SCR) Catalyst by Phosphorus: Proposed Mechanism and Solution," Presented at the International Pittsburgh Coal Conference, September 12 – 15, 2011.
M Gadgil et al, "Combustion Additives for Control of Phosphorus Effects and Achieving Mercury Reduction," Presented at Power-Gen Europe, June 3 – 5, 2014.
[392] US Patents 8303919 B2, 8691719, and 8716169.
[393] Telephone conversation Mandar Gadgil 3/18/16
[394] Gadgil, M., Pierson, L., Hansen, E., Silbaugh, D., Meier, J., "Improvement in Performance of SCR Catalyst Using Combustion Additives: Technology Status Update, 2012 Mega Symposium, Paper and Presentation #2
[395] Federal Register / Vol. 79, No. 20 / Thursday, January 30, 2014 / Rules and Regulations, pp 5140, 5150
[396] *See, Andover Report*, at p. 8.
[397] *See US EPA Air Pollution Control Cost Manual, EPA/452/B-02-001, Section 2, at 2-3 (January 2002).*
[398] *Id.*, at p. 2-4.

which it states correlates to the percent of engineering and design that is completed.[399] AACE's Class 5 estimates are used for conceptual screenings, have the widest range in accuracy, and have as little as 0 to 2% engineering completed in support of their development.[400] AACE's Class 4 estimates are used for studies and feasibility analyses have between 1 and 15% engineering completed in support of their development.[401] In contrast, Class 2 estimates correspond to between 30 and 75% engineering having been completed while Class 1 estimates correspond to between 60 and 100% of the engineering having been completed to support the development of those estimates.

For Class 2 estimates, even the minimum range of engineering at 30% would require major equipment, including the SCR system, to be awarded to a contractor so that they would have the ability to start the detail design for foundations, structural steel, and ductwork. Further, 60 to 75% engineering would be consistent with the beginning of construction phase, as the contractor prepares the site and installs the foundations. Finally, 100% completion of the engineering on a project is consistent with being well into the construction phase, with most mechanical and structural items being procured, manufactured and delivered to site. None of the above items were conducted to support the estimates generated in the *2014 BART Report*.

The cost estimating procedure described in the *Control Cost Manual* to obtain study level estimates consists of five steps: (1) obtaining the facility parameters and regulatory options for a given facility; (2) roughing out the control system design; (3) sizing the control system components; (4) estimating the cost of these individual components; and (5) estimating the costs (capital and annual) of the entire system.[402] Completing these steps does not require a level of engineering even approaching 30%. In reality, S&L completed well below 5% of the overall engineering to support the development of the Hunter and Huntington cost estimates. The hundreds of line items in our cost estimate reflect our experience with these types of retrofit projects, but do not reflect detailed engineering being conducted. S&L's estimates are consistent with Class 4 estimates which, as stated by Andover, are consistent with the study level estimates that provide the basis of the *Control Cost Manual*.

We could find no reference in the *Control Cost Manual* or AACE that defined the accuracy level or appropriate contingency based upon the number of line items included in a cost estimate. Therefore, Andover's assertion that contingency is not appropriate for a cost estimate that includes "many cost line items" is completely arbitrary.[403] In addition, Andover claims the contingency is not warranted because it says the S&L estimate "already has substantial contingency built into it through conservative assumptions," yet they fail to indicate which of our assumptions are conservative and why they necessitate the removal of project contingency.[404] Andover continues to describe the "importance of double-counting contingency in multiple places such as retrofit factor and contingency," but no retrofit factor is included in S&L's

[399] AACE International Recommended Practice No. 18R-97, November 29, 2011, at pg. 5.
[400] *Id.*
[401] AACE International Recommended Practice No. 18R-97, November 29, 2011, at pg. 2.
[402] *Control Cost Manual*, at 2-23.
[403] *See, Andover Report*, at pg. 8 and pg. 9.
[404] *Id.*, at pg. 9.

estimates.[405] Finally Andover states that the *Control Cost Manual* "explicitly anticipates that some analysts may, incorrectly, apply multiple contingencies," and that, "the CCM is clear that such double-counting should be avoided."[406] It appears to us that Andover has merely repeated requirements from the *Control Cost Manual* regarding double-counting to support its claim that S&L's has double-counted costs in its estimates. While we agree that doublecounting is not allowed, Andover fails to identify any specific line items in S&L's cost estimate that duplicate project contingency.

In conclusion, S&L's estimates are consistent with Class 4 estimates and do not include items in the estimate that overlap with project contingency. We agree with Andover that 15% contingency is appropriate for Class 4 estimates, which is what was included in our cost estimates.

Response: EPA disagrees with the comment that EPA improperly excluded project contingency costs. According to AACE 16R-90 on page 15:

> "Project Contingency is included to cover the costs that would result if a detailed-type costing was followed as in a definitive-type study. For a budget-type estimate, project contingency would range from 15% to 30%."
> According to NETL,[407]
> "AACE 16R-90 states that project contingency for a "budget-type" estimate (AACE Class 4 or 5) should be 15% to 30% of the sum of BEC, EPC fees and process contingency."

As noted earlier in this response to comments, when using the 2002 CCM methodology the direct capital costs and other associated costs are developed only from facility and SCR performance characteristics, such as boiler flow, NO_x levels, NO_x reduction, etc. The 2002 CCM therefore uses a parametric method for determining cost. The direct capital costs are determined using Equation 2.36 on page 2-42 of Section 4.2 Chapter 2 of the 2002 CCM and factors are applied to determine other costs, such as project contingency. The cost estimating methodology described in the 2002 CCM does not entail estimates of labor hours for specific tasks, quantities of material for specific parts of the system, etc. For the methodology described in the 2002 CCM a project contingency of 15% is recommended. Therefore, the more detailed and complete the estimate, the lower the project contingency should be. Furthermore, the 2002 CCM states at Section 1.1 Chapter 1, page 1-4,

> "The accuracy of the information in the Manual works at two distinct levels. From a regulatory standpoint, the Manual estimating procedure rests on the notion of the "study" (or rough order of magnitude - ROM) estimate, nominally accurate to within ± 30%. This type of estimate is well suited to estimating control system costs intended for

[405] *Id.*
[406] *Id.*
[407] US Department of Energy, National Energy Technology Laboratory, Quality Guidelines for Energy System Studies, -Cost Estimation Methodology for NETL Assessments of Power Plant Performance, DOE/NETL-2011/1455, p.5 (Aug. 2011), available at http://www.netl.doe.gov/energy-analyses/temp/QGESSCostEstimationMethodologyforNETLAssessmentsofPowerPlantPerformance_080111.pdf.

> use in regulatory development because they do not require detailed site-specific information necessary for industry level analyses."
>
> Also, on Section 1.1 Chapter 2, page 2-3 it states:
>
> "As mentioned in Chapter 1.1, the costs and estimating methodology in this Manual are directed toward the "study" estimate with a nominal accuracy of ± 30% percent. According to Perry's Chemical Engineer's Handbook, a study estimate is "… used to estimate the economic feasibility of a project before expending significant funds for piloting, marketing, land surveys, and acquisition … [However] it can be prepared at relatively low cost with minimum data."

Therefore, it is clear that the methodology described in the 2002 CCM entails a study using fairly little input data and at a low cost. By contrast, the cost estimate developed for PacifiCorp includes project definition down to details of how much of each type of material (to include details of indirect costs, such as quantity of handrails, cubic yards of material, SCR reactor doors, how many parking signs are needed, guard posts in the parking area, and square feet of road repair). Most certainly, the methodology outlined in the 2002 CCM did not envision a cost estimate with the level of detail included in the estimate developed by Sargent & Lundy in PacifiCorp's BART analysis. AACE provides the classifications shown in Table 2.[408]

[408] AACE International Recommended Practice No. 18R-97, COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRU CTION FOR THE PROCESS INDUSTRIES.

Table 2. Classifications of Cost Estimates[409]

	Primary Characteristic	*Secondary Characteristic*		
ESTIMATE CLASS	**MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges [a]
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%

Notes: [a] The state of process technology, availability of applicable reference cost data, and many other risks affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.

The two important columns to look at are the "Primary Characteristic" or "Maturity Level of Project Definition Deliverables" and "Methodology". The "Project Definition Deliverables" should not be confused with the percent of total project engineering, as Sargent & Lundy appears to have done in their comments.[410] Project Definition Deliverables is the degree to which the project has been defined, and the level of detail to which it is defined. The completeness is determined by how much detail is included in the estimate. The methodology used for Class 4 and Class 5 estimates are clearly indicated as parametric or factored models, such as described in the 2002 CCM (PacifiCorp has not disputed that the method as described in the 2002 CCM is Class 4 or 5) or, for example, in US EPA's Coal Utility Environmental Cost (CUECOST) Model. Table 3 shows an example of an estimate from the 2000 version of CUECOST, called CUECOST3.[411] CUECOST3 only estimates the costs for the major project areas, such as reactor housing and installation, ammonia handling system, etc. based upon process inputs such as boiler gas flowrate, NO_x level, percent reduction, retrofit difficulty factor, etc. In the case of CUECOST3 20% contingency is provided for (15% project and 5% process) because the completeness of the project definition deliverables is limited only to estimates of major system areas, and a significant portion of the costs would likely be overlooked without the contingency.

Table 3. Example of capital cost estimate developed using CUECOST3

SCR Capital Costs			Case1
Cost Basis (Year)			***1998***

[409] AACE International Recommended Practice No. 18R-97, COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRU CTION FOR THE PROCESS INDUSTRIE.

[410] S&L comments, Attachment 5 to PacifiCorp comments, pages 7-9.

[411] US EPA, *Coal Utility Environmental Cost Model (CUECost Model Version 1.0)*, available for download at https://www3.epa.gov/ttncatc1/products.html.

Reactor Housing and Installation	$		4,055,272
Ammonia Handling and Injection	$		1,917,147
Flue Gas Handling: Ductwork and Fans	$		5,112,798
Air Preheater Modifications	$		1,271,466
Misc. Other Direct Capital Costs	$		416,262
Equipment Capital Cost Subtotal	$		$12,772,945
Instruments & Controls	$		$255,459
Taxes	$		$766,377
Freight	$		$638,647
Total Direct Cost			$14,433,428
Total Direct Cost with Retrofit Factor	$		$18,763,456
General Facilities	$		$938,173
Engineering Fees	$		$1,876,346
Contingency	$		$3,752,691
Total Plant Cost (TPC)	$		$25,330,666
Total Plant Cost (TPC) w/ Prime	$		$26,090,586
Total Cash Expended (TCE)	$		$25,338,043
Allow. for Funds During Constr. (AFDC)	$		$2,778,208
Total Plant Investment (TPI)	$		$28,116,252
Preproduction Costs	$		$722,219
Inventory Capital			
Initial Ammonia(60 days)	$		$151,522
Initial Catalyst	$		$8,788,650
Total Capital Requirement (TCR)	$		**$37,778,643**
	$/kW		$76

By contrast, the estimate made by Sargent & Lundy for PacifiCorp does not use the parametric methodology described in Table 3 for Class 4 or 5 cost estimates. Moreover, the completeness of the Project Definition Deliverables in Sargent & Lundy's estimate is very thorough, and goes to a much greater level of detail than envisioned for a Class 4 or 5 estimate.

Therefore, the methodology used in the CCM falls into a Class 4 or Class 5, while the methodology used by PacifiCorp in their BART analysis[412] is clearly a far more detailed estimate that leaves out very little, if any, project definition. As a result, the cost estimate provided by PacifiCorp, with hundreds of line items for each SCR, each with estimated material quantity, material cost, labor quantity and labor cost – essentially, thousands of pieces of input data regarding cost and quantities of material – is a far more mature estimate with much greater project definition than envisioned in the 2002 CCM. In effect, PacifiCorp appears to be trying to combine an estimate with a very comprehensive definition of Project Deliverables while also using a project contingency intended for an estimate with much less complete definition of

[412] PacifiCorp's BART Analysis Update for Hunter Units 1 and 2 and Huntington Units 1 and 2(Aug.5, 2014).

Project Deliverables.[413] In light of the comprehensive list of project deliverables in the cost estimate made by Sargent & Lundy for PacifiCorp, the Project Contingency of 15% indicated for the method described in the 2002 CCM is far too high.
This determination is also consistent with a previous EPA determination regarding Project Contingency.[414]

Comment: [S&L, pp. 9-10] General Facilities

Andover Report: The cost estimate for PacifiCorp on all four units included a number of items that would fall into the category of General Facilities, and in order to avoid double-counting, an additional line item for General Facilities will not be included.[415]

S&L Response:

The following is an excerpt from the *Control Cost Manual* that refers to General Facilities: "Indirect installation costs are those associated with installing and erecting the control system equipment but do not contribute directly to the physical capital of the installation. This generally includes general facilities and engineering costs such as construction and contractor fees, preproduction costs such as startup and testing, inventory capital and any process and project contingency costs." [416]
Process and project contingency are dealt with separately in this response, and none of the remaining items listed above correspond to items from S&L's cost estimate that Andover highlights in this section of its report. Much of the equipment listed in S&L's estimate to which Andover objects is safety related and included to protect the operating personnel. This equipment is required by the process and contributes directly to the physical capital costs. Andover's objection to S&L's cost estimates related to General Facilities is not clear as S&L correctly followed the example illustrated in Chapter 2 of the *Control Cost Manual* with respect to General Facilities.

Response: EPA disagrees with the commenter. As described in AACE 16R-90:

> "General Facilities: These include roads, fences, shops, laboratories, office buildings, etc., and are generally in the range of 5% to 20% of Total Process Capital"

According to the 2002 CCM, for the methodology described in the 2002 CCM a value of 5% of Total Direct Costs is recommended.[417] No other line item costs for General Facilities are included in the 2002 CCM.

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[413] The comment tries to have it both ways by stating: "The hundreds of line items in our cost estimate reflect our experience with these types of retrofit projects, but do not reflect detailed engineering being conducted." If this statement is intended to cast doubt on the line items in order to justify use of a project contingency of 15%, then it calls into question the purpose of providing the line items in the first place.
[414] 79 FR 5032, 5140, 5151 (Jan. 30, 2014).
[415] *Id.*
[416] *US EPA Air Pollution Control Cost Manual, EPA/452/B-02-001, Section 2, at 2-43 (January 2002), available at https://www3.epa.gov/ttncatc1/dir1/c_allchs.pdf (hereinafter Control Cost Manual).*
[417] *Id.* at 2-44.

On the other hand, as described in the ATP report,[418] Sargent & Lundy included under the categories of Civil Work and Architectural the costs for access roads, signs, emergency eyewashes and pre-engineered buildings, including the quantities of materials, cost of material per unit, labor needed and cost of labor. In addition, in line item 27.00.00 of the cost estimate[419] Sargent & Lundy included the cost to coat or paint these architectural items. All of these items clearly fall under the category of General Facilities items, including the eyewash stations that Sargent & Lundy identifies under the category Architectural as opposed to process equipment or any other category. Adding an additional 5% for General Facilities would be double counting. Like Project Contingency, PacifiCorp appears to be using a General Facilities cost factor that was intended for a cost estimate as described in the 2002 CCM that is far less complete in terms of the definition of project deliverables. Therefore, the 5% General Facilities factor indicated in the 2002 CCM for the methodology described in the 2002 CCM is not allowed in combination with the estimate provided by PacifiCorp.

The statement in the comment about the equipment being related to safety and therefore required to be included in the costs is beside the point. We think safety for operating personnel is extremely important, however we do not think costs related to safety should be double-counted in making cost estimates.
This determination is also consistent with a previous EPA determination regarding General Facilities costs.[420]

Comment: [S&L, pp. 10-11] Allowance for Funds Used Under Construction (AFUDC)

Andover Report: AFUDC is not included in the overnight cost methodology of the CCM and therefore was not allowed. PacifiCorp correctly excluded this from their estimate. [421]

S&L Response:

S&L disagrees that the *Control Cost Manual* describes an overnight approach to calculating capital costs. The *Control Cost Manual* does not once define or even mention the overnight methodology as being the basis for estimating costs. Rather, the *Control Cost Manual* describes a constant dollar approach that annualizes all capital costs and O&M costs (on a constant-dollar basis) over the useful life of the project.

The term "total capital investment" is defined in the *Control Cost Manual* to include all costs required to purchase the equipment needed for the control system (purchased equipment costs), the costs of labor and materials for installing that equipment (direct installation costs), costs for site preparation and building, working capital, and off-site facilities, as well as indirect installation costs "such as engineering costs; construction and field expenses (i.e., costs for

[418] ATP Report, page 10.
[419] PacifiCorp's BART Analysis Update for Hunter Units 1 and 2 and Huntington Units 1 and 2, August 5, 2014, Pdf pp 54, 65, 89, 100.
[420] 79 FR 5141, 5149.
[421] *See, Andover Report*, at pg. 10.

construction supervisory personnel, office personnel, rental of temporary offices, etc.); contractor fees (for construction and engineering firms involved in the project); start-up and performance test costs (to get the control system running and to verify that it meets performance guarantees); and contingencies.[422] AFUDC is an indirect capital cost that should be included in a capital cost estimates prepared and is in accordance with the methodology described in the *Control Cost Manual*.

AFUDC accounts for the time value of money associated with the distribution of construction cash flows over the construction period.[423] AFUDC can represent a significant cost on large construction projects with long project durations and can be calculated based on a typical construction project cash flow and real rate of interest. EPA's CUECost model includes AFUDC in its calculation of air pollution control technology capital costs using an AFUDC factor and the total plant cost.[424] For SCR projects, the project could be spread over a construction period of 18 months or more.

Although specifically referenced in the *Control Cost Manual*, and more reflective of real-world project costs, the *2014 BART Report* excluded AFUDC in recognition of EPA's opinion that such costs should not be factored into five-factor Regional Haze BART analyses.

Response: We disagree that AFUDC is an indirect capital cost that should be included in a capital cost estimates and that this is in accordance with the methodology described in the *Control Cost Manual*. The utility industry uses a method known as "levelized costing" to conduct its internal comparisons, which is different from the methods specified by the CCM. Utilities use "levelized costing" to allow them to recover project costs over a period of several years and, as a result, realize a reasonable return on their investment. The CCM uses an approach sometimes referred to as overnight costing, which treats the costs of a project as if the project were completed "overnight", with no construction period and no interest accrual. Since assets under construction do not provide service to current customers, utilities cannot charge the interest and allowed return on equity associated with these assets to customers while under construction. Under the "levelized costing" methodology, AFUDC capitalizes the interest and return on equity that would accrue over the construction period and adds them to the rate base when construction is completed and the assets are used. Although it is included in capital costs, AFUDC primarily represents a tool for utilities to capture their cost of borrowing and return on equity during construction periods. AFUDC is not allowed as a capitalized cost associated with a pollution control device under CCM's overnight costing methodology, and is specifically disallowed for SCRs (i.e., set to zero) in the CCM.[425] Therefore, in reviewing other BART determinations, EPA has consistently excluded AFUDC.[426] For details on why we have excluded AFUDC, i.e. to help ensure consistent and equitable BART determinations, please see our later

[422] *Control Cost Manual*, at 2-5.
[423] *Id.*, at pg. 33.
[424] *Id.*, at pg. 17.
[425] CCM (Tables 1.4 and 2.5 show AFUDC value as zero).
[426] See, e.g., 77 FR 20894, 20916-17 (Apr. 6, 2012) (explaining in support of the North Dakota Regional Haze FIP, "we maintain that following the overnight method ensures equitable BART determinations * * *."); 76 FR 52388, 52399-400 (Aug. 22, 2011) (explaining in the New Mexico Regional Haze FIP that the Manual does not allow AFUDC).

response, which also notes the Ninth Circuit Court of Appeals opinion upholding EPA's rationale.

Comment: [S&L, pp. 12-13] Indirect Installation Costs

Andover Report: As a result, several costs cited in PacifiCorp's cost estimate, such as Contractor Construction Management / Field Engineering and Contractor Training Classes, are not allowed because these are included in the 10% Engineering and Home office fees that are already included in the cost. [427]

S&L Response:

We refer Andover to the *2014 BART Report,* which identifies what indirect costs are included in the cost-effectiveness calculations.[428] This information shows that several indirect costs from S&L's estimates were specifically excluded by S&L from the cost-effectiveness calculations, which was done to avoid double counting. Instead of including the costs from S&L's estimates, we followed the example calculations from Chapter 2 in the *Control Cost Manual* to estimate indirect costs due to engineering and home office fees. As indicated in *2014 BART Report*, we did include several items that are not specifically listed in the *Control Cost Manual*'s description of indirect costs due to engineering and home office. Those costs include: 1) Construction Management 2) Spare Parts Required for Startup and 3) Training supplied by the contractor. To clarify these terms, Construction Management is generally provided by a third-party, other than the EPC contractor, to ensure that the construction activities are proceeding according to the contract requirements and that the work is coordinated with other plant activities. Spare parts required for startup are only the spare parts required by the EPC contractor during the commissioning and startup phases, not the spare parts that are included in O&M costs as required for annual maintenance. Training, which is generally conducted by various equipment providers, is conducted to familiarize operators with the new equipment and teaches them how to operate and maintain the equipment. The *Control Cost Manual* does not list these items as included in its description of "indirect costs due to engineering and home office fees," therefore we included them in our total direct costs so that these real costs would not be excluded from the cost-effectiveness calculation.

In contrast, there were several indirect cost line items in S&L's cost estimates that were specifically excluded from the cost-effectiveness calculations to avoid double counting, including 1) Engineering services, 2) Startup and Commissioning, 3) Initial Fills and 4) EPC Fee. Although all of these costs are real costs for these types of projects, we excluded them from the cost effectiveness calculations because the description of engineering indirect costs described in the *Control Cost Manual* specifically lists these items, except for initial fills, which we conservatively omitted because we believed these could be interpreted as costs already included in startup and commissioning costs.

Using the Hunter 1 S&L detailed cost estimate and 50% of the S&L detailed common estimate

[427] *See, Andover Report*, at pg. 11.
[428] *2014 BART Report*, Appendix B, pg. 1.

(to illustrate the total Hunter 1 costs), the following table shows the indirect costs due to engineering and home office fees that S&L excluded from the cost-effectiveness calculations to avoid double counting, compared to those that result from using EPA's formula of 0.1 * TDC provided in the *Control Cost Manual (CCM)*.

Item	Indirect Costs Due to Engineering and Home Office Fees	Hunter 1 S&L Estimate	50% of Common Hunter S&L Estimate
1	Engineering Services	$8,170,900	$511,700
2	Startup and Commissioning	$1,021,400	$63,950
3	Initial Fills	$35,000	---
4	EPC Fee	$11,309,900	$718,950
5	Total excluded from *each* S&L estimate[41]	$20,537,200	$1,294,600
6	**Total excluded from *both* S&L Estimates[42]**	**$21,831,800**	
7	**Costs Using 0.1 * TDC (Included in Cost-Effectiveness)**	**$12,487,594**	
8	Difference Between Excluded and Included Costs[43]	$9,344,206	

[41] This is the sum of items 1 through 4 in each column.
[42] This is the sum of the total excluded from the Hunter 1 Estimate and 50% of the Common Hunter Estimate
[43] This is the difference between Items 6 and 9, showing how using the CCM methodology for these indirect costs actually leaves over $9 million of estimated costs out of the cost-effectiveness calculations.

From this table, it can be seen that S&L estimated indirect costs due to engineering and home office fees of over $21 million, but to avoid double counting indirect costs identified in the *Control Cost Manual,* those costs were excluded from the cost-effectiveness calculations. Instead, we followed EPA's formula in Chapter 2 which estimates indirect costs due to engineering and home office fees to be 0.1 * TDC, which for Hunter 1 was approximately $12.5 million. Therefore, the *2014 BART Report* cost-effectiveness calculations are conservative with respect to indirect costs due to engineering and home office fees because, by following EPA's example, the cost-effectiveness calculations for Hunter 1 do not include over $9 million in real costs that would actually be incurred. When considering all four units at Hunter and Huntington, approximately $ 38.8 million in indirect costs due to engineering and home office fees were conservatively not included in the cost-effectiveness analysis.

Response: EPA disagrees with the commenter. Per Table 2.5, on page 2-44 Section 4.2 Chapter 2 of the 2002 CCM, indirect installation costs are General Facilities, Engineering & Home Office Fees, and Process Contingency. EPA's treatment of General Facilities and Process Contingency are discussed elsewhere in this response to comments. For Engineering & Home Office Fees EPA applied the recommended 10% of Total Direct Costs per the 2002 CCM (see line 38 of SCR PacifiCorp Annual Adjusted worksheet of UT EGU BART Costs workbook). Contractor Construction Management and Contractor Training Classes (see lines 31 and 33 of same worksheet) were excluded because they are included in the Engineering & Home Office Fees. PacifiCorp and Sargent & Lundy have asserted that these are "real world" costs and that the costs they estimate for Engineering & Home Office fees exceed the costs estimated by EPA per the

2002 CCM of 10% of the Total Direct Costs.[429] Nevertheless, 10% of Total Direct Costs is what is permissible under the 2002 CCM. To the extent that real world costs may exceed the 10% allowed for by the CCM, the commenter has not established that this would alter EPA's estimates of cost effectiveness in a meaningful manner. We also note that we accepted a number of other conservative cost assumptions made by the commenter (catalyst replacement frequency, catalyst volume, and SCR reactor design).

Comment: [S&L, pp. 14-19] Catalyst Costs, Catalyst Volume, and SCR Reactor Design

(This response to comments combines a number of related comments.)

Andover Report: Sargent & Lundy arrives at a catalyst cost by escalating a 1998 cost of catalyst using CEPCI, which does not consider what catalyst actually costs today. These costs are at the upper level to well above what catalyst actually costs. [430]

S&L Response:

Andover misunderstands the source of $240/ft^3 ($8,470/m^3) and the $290/ft^3 ($10,200/m^3) by assuming S&L escalated 1998 costs based on CEPCI indices. These two numbers come directly from the *Control Cost Manual* example calculations.[431] The cost-effectiveness comparison worksheets included in Appendix A of the *2014 BART Report* are merely repeating EPA's methodology illustrated in the *Control Cost Manual*. In addition, the right-most column of S&L's cost-effectiveness worksheets include a comment that states the CEPCI indices were not used to escalate catalyst costs included in the capital cost estimates because 2011 cost values were utilized. Andover subsequently points out that the capital cost included in S&L's detailed cost estimates contained $6,750,000 for 1040 m^3 of catalyst, with additional labor costs, which increase the total catalyst cost to $8,096,100. [432] The labor costs included are required for the installation of the catalyst modules in the reactor. Dividing the total cost by the volume from the capital cost estimate ($8,096,100/1040 m^3) results in a volumetric price of $7,785/m^3.

Andover arbitrarily selected $5,500/m^3 as a reasonable basis for future catalyst based on a reference plot that does not appear to include freight costs to deliver the modules to site or labor costs to load the catalyst in the reactor.[433] The SCR catalyst capital costs are consistent with S&L's experience with recent pricing received from vendors for actual SCR retrofit projects on coal-fired boilers, including freight costs for delivery as well as installation costs. We note S&L's cost is well below both the 1998 and 2011 costs utilized by EPA in the SCR example calculation in the *Control Cost Manual*. Furthermore, S&L's catalyst cost is well below that reported in EPA's fact sheet, also referenced in Andover's report, which states that the approximate SCR catalyst cost is $10,000/m^3.[434] Therefore, S&L's catalyst capital costs are not excessive, reflect current catalyst pricing, and are well within the costs included in the *Control Cost Manual* as well as information available on EPA's website.

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[429] S&L pages 12-13, PacifiCorp page 34.
[430] *See, Andover Report*, at pg. 11.
[431] *Control Cost Manual*, Section 4, Chapter 2, page 2-50.
[432] *Andover Report*, pg. 11.
[433] *Id.*
[434] US EPA, *Air Pollution Control Technology Fact Sheet*, EPA-452/F-03-032 p.1 (July 15, 2003).

With respect to the replacement catalyst costs used in the *2014 BART Report*, S&L expects actual replacement costs to be closer to $10,000/m3 similar to what EPA uses in the *Control Cost Manual* because these replacement costs include the cost of the catalyst itself, the freight cost to deliver the catalyst to site, the labor cost to remove the spent catalyst, the cost to dispose of the spent catalyst modules, and the labor cost to install the new catalyst. However, to be conservative, S&L used only the $240/ft3 ($8,470/m3) from the *Control Cost Manual* as the replacement value of the catalyst.[435] Therefore, the replacement catalyst cost used in the cost effectiveness worksheets is not excessive, reflects current catalyst pricing, and is well within the costs included in the *Control Cost Manual*.

Andover Report: The estimate by Sargent & Lundy of catalyst volume appears to be too great.[436]

S&L Response:

The amount of SCR catalyst volume required depends on the following design parameters: 1) gas volume, 2) gas temperature, 3) Amount of NO_x removed, 4) catalyst life, 5) fuel properties (which dictate the deactivation rate), and 6) SO_2 to SO_3 oxidation rate. The data included in Andover's report that they use to conclude S&L's catalyst volume is over-estimated contain only one of these variables (catalyst life). Notably, none of the catalyst life data presented includes units designed with 32,000 hours of life, which is the design life required for Hunter and Huntington to accommodate their current outage schedules. The data reported by Andover incorrectly includes gross output (MW), which is not directly proportional to gas volume in the case of the Hunter and Huntington units, each of which are over 5,600 feet in elevation, and as previously discussed, have significantly higher gas volumes for equivalently rated units located at sea level. For this reason, gross output (MW) cannot be used to compare catalyst volumes for plants that vary in elevation. In addition, the table lists % NO_x reduction, but catalyst volume depends on the amount of NO_x removed, not the % reduction. For example, consider two SCR systems that are equivalent with respect to all variables with the exception that one SCR system is designed for 90% reduction with an inlet NO_x of 0.4 lb/MMBtu (i.e. an outlet NO_x of 0.04 lb/MMBtu) and the other is designed for 90% reduction with an inlet NO_x of 0.5 lb/MMBtu (i.e. an outlet NO_x of 0.05 lb/MMBtu). The second plant will require substantially more catalyst because it is removing 0.45 lb/MMBtu of NO_x (0.5 minus 0.05) while the first is removing only 0.36 lb/MMBtu (0.4 – 0.04). Therefore, the data presented by Andover cannot be utilized to conclude anything with respect to how catalyst volumes compare at different locations and has resulted in an incorrect conclusion by Andover that the SCR volume at Hunter and Huntington is excessive.

As noted in the *2014 BART Report* cost-effectiveness worksheets, EPA's empirical formulas from the *Control Cost Manual* are insufficient to predict catalyst volume because they do not include many of the necessary parameters described above, and most notably do not account for catalyst life. Therefore, we disagree with Andover's methodology to utilize those equations to

[435] *2014 BART Report*, Appendix B, Located in Table labeled, "EPA Cost Manual Inputs / Constants," within the row identified in this table as "Replacement Catalyst Cost."
[436] *Andover Report*, pg. 12.

estimate catalyst volume. Andover calculated catalyst volume by using a second methodology, but this methodology is based on a proposal by EPA in 2015 to revise its *Control Cost Manual*. EPA has not yet responded to comments on this methodology, and S&L has not evaluated its technical validity. We note that while the formulas do include catalyst life, Andover calculated the catalyst volume based on 16,000 hours of catalyst life, instead of 32,000 hours, which is what will be utilized for Hunter and Huntington. Furthermore, Andover arbitrarily selected deactivation rates consistent with Eastern Bituminous even though the Hunter and Huntington fuels are Western Bituminous, which as discussed earlier, have not been utilized before in an SCR system. If Andover's worksheet using this methodology is changed to account for 32,000 hours of life and assuming a more conservative deactivation rate such as 0.65 to coincide with PRB, then the catalyst volume is predicted to be 949 m^3, very close to S&L's estimated 1040 m^3. To be clear, we are not stating that EPA's proposed methodology is valid merely because changing some input parameters resulted in an estimate close to ours; instead, we are saying that flawed assumptions were used by Andover to under-estimate catalyst volumes using a method that has not yet been approved for use in the *Control Cost Manual*.

S&L estimated the catalyst volume at Hunter and Huntington based on contract values for the Naughton 3 SCR project. Andover incorrectly assumes that there was no SCR project at Naughton 3. In fact, S&L supported PacifiCorp during conceptual design and specification development to retrofit a SCR system, and other air pollution control equipment, at Naughton 3. PacifiCorp awarded a final EPC contract for the project, and the Contractor began its engineering effort. Shortly after the SCR contract was awarded, however, the project was canceled due to a later decision to convert the unit from burning coal to burning natural gas. During the conceptual design, S&L used its proprietary methodology (that depend on the 6 parameter listed above) to estimate catalyst volume for Naughton 3 to be 623 m^3, based on 16,000 hours of catalyst life. The final SCR contract was designed to include 810 m^3 of catalyst, based on 32,000 hours. We therefore, concluded that for longer catalyst life while burning Western Bituminous fuels, S&L's method under estimated catalyst volume by approximately 30%. As such, when we applied our proprietary formulas to the Hunter and Huntington design basis, we predicted 800 m^3, but increased that by 30% to estimate 1040 m^3, to account for the discrepancy we noted on the Naughton 3 SCR project. To be clear, S&L is not saying that in all cases the difference in catalyst volume between 16,000 and 32,000 hours of life is 30%, but we found that our estimating technique was off by this amount for the Naughton example, and we believe that because the Hunter and Huntington fuels have similar characteristics, it was reasonable to adjust the catalyst volume by the same amount for this project.

Andover comments that the 32,000 hours of catalyst life is unusual, and S&L agrees that this catalyst life is not typical in the industry. However, PacifiCorp has committed itself to reducing maintenance outage frequency to every four years; therefore, they intend to replace catalyst outage with that frequency. The UARG reference cited in Andover's report correctly points out that," to confine catalyst replacement to major outages," is one strategy to minimize catalyst replacement costs.[437] If PacifiCorp was required to take an extra week long outage every two years in accordance with Andover's presumed 16,000 hours of catalyst life, then the cost

[437] *See* Cichanowicz, J. E., *Current Capital Cost And Cost-Effectiveness Of Power Plant Emissions Control Technologies*, p. 6-6 (Jan. 2013) (Prepared for Utility Air Regulatory Group).

effectiveness calculations would need to include the cost of replacement power for that extra outage, which are currently not included.

In summary, the catalyst volumes estimated by S&L are consistent with an actual SCR project designed to burn Western Bituminous fuels similar to those that would be burned at Hunter and Huntington, and they account for the 4-year maintenance cycle on which these plants operate. In contrast Andover's catalyst volumes are under-estimated because they utilize flawed methodologies developed by EPA that do not account for important design parameters such as catalyst life.

Andover Report: Only one reactor is necessary as opposed to two. This is because only about half as much catalyst is actually necessary. [438]

S&L Response:

Although we previously illustrated that Andover under estimated the catalyst volume requirements to retrofit SCR systems at Hunter and Huntington, the number of reactors is not at all dependent on the volume of catalyst. Andover states, "the cross sectional area of the catalyst reactors will be reduced roughly in proportion to the catalyst volume," and concludes that "only one reactor of roughly the same size as one of the two reactors assumed by Sargent & Lundy is necessary." The reactor design is primarily set by gas flow and velocity, not catalyst volume. High velocities, in excess of 20 feet per second, lead to catalyst erosion. The two reactor conceptual design developed by S&L was based on an average velocity at the catalyst face of approximately 16 feet per second (fps), matching other project designs including that of Naughton 3. By changing the design to a single reactor with 50% of the cross-sectional area, twice as much flue gas would need to flow through this reactor, leading to the average velocity at the face of the catalyst doubling to 32 fps. Velocities in this range are technically infeasible for a variety of reasons. For one, the residence time of the flue gas in the reactor would be insufficient to achieve the NO_x reduction required. More importantly, this velocity would erode the catalyst in an extremely short period of time, rendering the SCR system useless.

In conclusion, even if a lower volume of catalyst were acceptable, which it is not, the number of reactors required at both Hunter and Huntington would remain two. Andover's conclusion that only a single reactor with 50% of the original cross-sectional area is acceptable for these units illustrates their lack of experience with SCR retrofit projects. All adjustment made to the estimate to adjust for a single-reactor design are completely inappropriate and technically infeasible.

Andover Report: Andover makes an unsupported assertion that "most replacement catalyst in the United States is regenerated catalyst."

S&L Response:

The two references cited by Andover do not support this claim, and it is not consistent with

[438] *Andover Report*, pg. 16.

S&L's experience in the industry. Neither the first reference, which describes various processes that were used to regenerate catalyst in 2001, nor the second reference, which describes catalyst regeneration experience in Germany (not the United States), present any data indicating that the majority of replacement catalyst in the U.S. is regenerated. S&L has participated in several catalyst replacement projects in the last year and in each of these projects new catalyst was purchased for the spare or replacement layer. In addition, due to mechanical degradation of the modules, which cannot be recovered, the mechanical life of regenerated catalyst is much lower than new catalyst and has not been guaranteed to meet the duration which the catalyst is typically expected to remain within the reactor (≥64,000 operating hours).

Response: EPA disagrees with the commenter. The cost of the SCR designed by Sargent & Lundy is impacted by the very high quantity of catalyst that is assumed by Sargent & Lundy which impacts the amount of catalyst needed as well as the amount of steel and other materials necessary to build the SCR reactor. Sargent & Lundy acknowledges at 18 of their comments that 32,000 hours of operating time between catalyst changes, which impacts the catalyst volume, is not typical. Therefore, it is reasonable to question this assumption and the resulting catalyst volume. This high quantity of catalyst has the impact of creating the need for a very large SCR reactor with roughly twice as much catalyst as would normally be expected. ATP provided complete documentation of how the catalyst volume was arrived at while using two different methods that are consistent with the 2002 CCM and selecting the largest volume of catalyst as the basis of the design for all Hunter and Huntington units. These calculations were provided in the worksheet developed by ATP[439] and are described in more detail below.

EPA provides the following discussion.

i. Catalyst price

Catalyst is priced at market prices, and the Cichanowicz 2013 reference demonstrates that pricing has dropped dramatically since SCR was first used on coal-fired boilers in the United States. In its analysis ATP and EPA used a catalyst price of $5500 per cubic meter as shown in Cichanowicz.[440] The price used by Sargent & Lundy varies from $6500 per cubic meter[441] (not installed) to $8470 per cubic meter (installed). Sargent & Lundy estimated the cost of installation to be $1,285/cubic meter. In justifying their assumed cost at page 15 of their comments, S&L cites the EPA fact sheet on SCR as stating that SCR catalyst cost is $10,000; however, S&L fails to mention that the most recent citation on the EPA fact sheet they refer to is from 2002. Therefore, the EPA fact sheet does not provide current information on SCR catalyst pricing.[442]

Although catalyst pricing is generally closely held information by the catalyst suppliers, EPA was able to find information on catalyst pricing in the publicly available documents relating to

[439] NO_x -SCR_$ton in the workbook UT_EGU_BART Costs.xls that was developed by ATP.
[440] Cichanowicz, at 6-6.
[441] Dividing the cost of catalyst of $6,760,000 at line 31.53.10 of the Conceptual Cost Estimate by the volume of 1040 m3 results in $6500/m3 (see page 54 of 2014 PacifiCorp BART analysis). Installation labor adds $1,336,144, or $1285/m3 for a total of $7,785/m3.
[442] S&L page 15.

the Lakeland MacIntosh 3 SCR catalyst layer replacement. These documents indicated that new catalyst prices had, in fact, dropped to around $3500/cubic meter or less.[443] Adding $1285 per cubic meter for installation per Sargent & Lundy's estimate results in a cost of under $5000 per cubic meter. The existing layers were 5380 cubic feet, or about 152 cubic meters each.[444] In the case of Lakeland MacIntosh 3, they decided to regenerate two layers of catalyst for a price of $501,660[445] rather than purchase new catalyst. This equates to roughly $1650 per cubic meter. Therefore, for EPA's BART analysis, an installed price of $5500 per cubic meter for catalyst is conservatively high and will continue to be assumed for both initial installation and replacement catalyst, and this is consistent with other recent EPA determinations.[446]

ii. Catalyst volume and SCR reactor design

The catalyst design directly impacts the design of the SCR reactor. Therefore, the catalyst design and volume will be addressed first. PacifiCorp and Sargent & Lundy did not provide any detailed calculations or even a catalyst vendor quotation, but have asserted that the estimate that they developed was scaled from the Naughton 3 estimate based upon Sargent & Lundy's "proprietary methodology."[447] Without more information, it is impossible to critique this methodology or determine if the methodology is consistent with the 2002 CCM.

On the other hand, the methodology used by ATP is consistent with the 2002 CCM. Two approaches for estimating catalyst volume are provided in the 2002 CCM. The Empirical Approach is described in equations 2.19 through 2.24 of the 2002 CCM (Section 4.2, Chapter 2 pages 2-36-2-37). The Activity Approach is described on pages 2-32 through 2-36 of the 2002 CCM and it also is in the 2015 draft CCM as described in the ATP report. The only difference from the 2002 CCM is that ATP, as described in the ATP report at 16-17, used CUECOST to develop estimates of gas flowrate, and, as discussed later in these comments, this results in a slightly higher gas flowrate than estimated by Sargent & Lundy. ATP selected the largest catalyst size predicted by the two methods described in the 2002 CCM. Hence, both methods used by ATP are consistent with the 2002 CCM, and Sargent & Lundy's and PacifiCorp's assertion that the methodology "has not yet been approved for use in the Control Cost

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[443] NOTICE TO BIDDERS, INVITATION TO BID UNIT 3 SCR CAT ALYST LAYER REPLACEMENT, At the, MCINTOSH POWER PLANT, September 1, 2015, BID NO. 52 66A (pdf pages 19 and 46 show 2 SCR reactors pdf page 49 for number of modules per reactor and dimensions of modules. 90 modules, assuming typical module cross section of 1.8 m2 and depth of 1.14 m and CERAM price $570,000 results in $3100/m3.
BID TABULATION, CITY OF LAKELAND FLORIDA, PURCHASIN G AND STORES DIVISION, 1140 E PARKER STREET, LAKELAND, FL. 33801, Bid Number: 526 6A, Title: Unit 3 SCR Catalyst Layer Replacement, Date: 9/23/2015.
Memorandum, To Mayor and City Commission, From City Attorney's Office, Re: Approval to Procure Services with SCR-Tech to Regenerate Catalyst Layers for McIntosh Power Plant Unit 3 Selective Catalytic Reduction Reactor System, January 4, 2016
[444] Memorandum, To Mayor and City Commission, From City Attorney's Office, Re: Approval to Procure Services with SCR-Tech to Regenerate Catalyst Layers for McIntosh Power Plant Unit 3 Selective Catalytic Reduction Reactor System, January 4, 2016, p 55.
[445] *Id.* at 2, 81.
[446] 79 FR 5141, 5143.
[447] S&L comments at 17.

Manual"[448] is incorrect. Comparison of the Activity Approach in the 2002 CCM to the methods used by commercial catalyst vendors demonstrates that it is also consistent with the approach used by commercial catalyst vendors, as described by Cochran in 2011. For example, both methods require a determination of the necessary reactor potential and catalyst activity[449] at a time in the future, and, assuming a deactivation rate, determine the reactor potential and catalyst activity that is necessary when initially installed.[450] The methodology used by EPA in Equations 2.9 through 2.18 of the 2002 CCM (Section 4.2, Chapter 2 pages 2-32 through 2-36)[451] to calculate catalyst volume using the Activity Approach is an accepted and widely used methodology. In addition to being similar to the method described by Cochran, it is similarly consistent with the methodology in commercially available software that is licensed to Marsulex Environmental Technologies and is used for design of commercial SCR systems in China.[452] The primary differences between what is described in the 2002 CCM and the commercially available software are that: 1) the commercial software includes a database of SCR catalyst design characteristics for commercially available catalyst from multiple vendors; 2) the commercial software can address variability in flow and ammonia to NO_x distribution in the SCR reactor, and; 3) the commercial software also determines SCR reactor layout, dimensions and SCR reactor weight loadings. Hence, the Activity Approach that EPA used that is described on pages 2-32 through 2-36 of the 2002 CCM is an established and accepted approach for calculating the volume of SCR catalyst that is consistent with commercial methods.

By contrast, Sargent & Lundy has not provided any information on how it determined the catalyst volume for the Naughton 3 SCR that they designed but PacifiCorp did not build, which they claim on page 17 of their comments is the basis of the design for PacifiCorp Hunter units 1 & 2 and Huntington units 1 & 2. Sargent & Lundy at 17 states that ATP's workbook used for this determination results in similar catalyst volume as Sargent & Lundy estimated if deactivation rate is increased and replacement period is extended to 32,000 hours. Therefore, these two parameters are explored in detail later in this response to comments.

iii. Elevation and inlet velocity

Sargent & Lundy also makes several incorrect assertions about ATP's method that are addressed below. These incorrect assertions include:

- ATP did not account for elevation of the plants. (S&L at 2,3, 16, 19, PacifiCorp at 32, 35)

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[448] S&L comments at 17.

[449] Reactor potential is a function of catalyst activity and the catalyst area velocity, or the normalized volume flowrate of gas divided by the surface area of the catalyst, and is defined in slide 11 of Cochran. While area velocity of the catalyst will not change over time, catalyst activity will be reduced. Although the 2002 CCM does not use the term reactor potential, reactor potential is equal to the negative of what is calculated in Equation 2.16a in Chapter 2 of Section 4.2 of the 2002 CCM.

[450] John Cochran, "Fuel Impacts on Design and Performance of Catalysts", McIlvaine "Hot Topic Hour", June 30, 2011, slides 12-16.

[451] NOx -SCR_$ton in the workbook UT_EGU_BART Costs.xls that was developed by ATP.

[452] See "ATP teams with Marsulex Environmental Technologies (MET) to offer SCR in China" at www.AndoverTechnology.com.

- ATP did not consider inlet velocity of the catalyst in design (S&L at 19)

On the other hand, ATP's method, which is consistent with the 2002 CCM does account for all of these factors.

Contrary to PacifiCorp's and S&L's assertions, ATP accounted for elevation and accounted for inlet velocity. As noted previously in these responses to comments, process calculations used to determine SCR catalyst volume are in a worksheet developed by ATP.[453] Gas flowrate is determined in the calculations and data shown in lines 6 through 28. Importantly, the altitude and altitude adjustment for elevation are shown in lines 10 and 11. These permit determination of actual gas flowrate in line 28 while accounting for the elevation of the plants. Actual gas flowrate is used to estimate the gas velocity into the catalyst face in line 32: calculated to be slightly over 5 m/s, or somewhat over 16 ft/s in ATP's prior estimate using a single, 50 foot square SCR reactor, which is slightly over 16 ft/s. On the other hand, using S&L's estimated gas flowrate of 1,099,953 ACFM per reactor for the Hunter units 1,148,582 ACFM per SCR reactor for the Huntington Units[454] for a total of 2,199,906 ACFM and 2,297,164 ACFM, respectively, and a single 50 foot by 50 foot SCR reactor per unit as used in ATP's previous workbook results in 14.7 ft/s and 15.3 ft/s velocity, respectively – both under 16 ft/s. In fact, at these flow rates a cross sectional area of 2,208 square feet (213 square meters) and 2,392 square feet (222 square meters) are required for the Hunter and Huntington units, respectively to achieve a velocity of 16 ft/s.[455] Sargent & Lundy's design has two 40 foot by 40 foot SCR reactors.[456] This results in a cross sectional area of about 297 square meters for both reactors if 40 foot is the inner dimension and about 268 square meters if 40 feet is the outer dimension and a 1 foot average casing thickness is assumed.[457] Therefore, the total SCR reactor cross sectional area is *at least* 20% greater (at least 26% in the case of Hunter) than needed based upon Sargent & Lundy's estimates of gas flowrate.

As noted in S&L comments at 19, inlet velocity is an important parameter in design of the SCR reactor because it impacts erosion of the catalyst. But it also impacts catalyst activity because the effective activity is the result of both the surface chemistry and porosity of the catalyst as well as mass transfer effects in the catalyst channel.[458] Therefore, gas velocity also should not be too slow, as it will adversely impact catalyst activity (see figure 6 in ATP report, page 14). Too slow of an inlet velocity will also result in more catalyst than in a more optimized design.

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[453] NOx -SCR_$ton in the workbook UT_EGU_BART Costs.xls that was developed by ATP and provided with the ATP Report dated October 22, 2015.

[454] PacifiCorp's BART Analysis Update for Hunter Units 1 and 2 and Huntington Units 1 and 2, August 5, 2014, pp 21, 27, 33, 39, line 51; also see lines 29-32 of NOx -SCR_$ton worksheet in UT_EGU BART Costs_2016_RTC .xls worksheet provided with this response to comments.

[455] Divide 2,297,164 ACFM by 16 fps and then by 60 sec/min.

[456] PacifiCorp's BART Analysis Update for Hunter Units 1 and 2 and Huntington Units 1 and 2, August 5, 2014, pp 79, 114.

[457] NOTICE TO BIDDERS, INVITATION TO BID UNIT 3 SCR CAT ALYST LAYER REPLACEMENT, At the, MCINTOSH POWER PLANT, September 1, 2015, BID NO. 52 66A, see page 49 showing 1 foot from catalyst module to exterior or reactor.

[458] Electric Power Research Institute, Protocol for Laboratory Testing SCR Catalyst Samples 1012666, Final Report, December 2006, pp. 3-1 to 3-2.

Therefore, EPA did consider both elevation and inlet gas velocity to the SCR catalyst in its previous estimate, and it is apparent that Sargent & Lundy's use of two 40 foot by 40 foot SCR reactors per unit is larger than needed. Nevertheless, to be conservative, EPA will allow for this size SCR reactor in determining cost of SCR. We reference costs based on the conservative assumption of a larger reactor size when comparing cost-effectiveness values for our BART determination for Hunter and Huntington with values for other BART determinations.

iv. SCR Catalyst Sizing

EPA used each of the two methods described in the 2002 CCM for estimating the volume of catalyst, what is referred to in the ATP report as the Empirical Approach using Equation 2.19 and what is referred to in the ATP report as the Activity Approach using Equation 2.18 on page 2-36 of Chapter 2, Section 4.2 of the CCM. The catalyst sizing using the Activity Approach (lines 73-85 of the original worksheet NO_x -SCR_$ton and lines 77-89 of the same worksheet provided with this response to comments) resulted in a higher catalyst volume than the Empirical Approach (lines 63-71 of the original worksheet NO_x -SCR_$ton and lines 67-75 of the same worksheet provided with this response to comments).[459] EPA selected the largest catalyst volume determined by the two approaches and the largest catalyst volume estimated for each of the units and applied that largest volume to all units. This was an approach that was therefore consistent with the 2002 CCM and also conservative in selecting the largest catalyst volume. The next discussion will therefore focus on the Activity Approach and the assumptions used.

As noted in these comments, the Activity Approach is used, which is consistent with the 2002 CCM and commercially used methods to calculate catalyst volume. The method factors in:

Gas flowrate
NO_x Removal
Ammonia slip
Initial catalyst activity
Deactivation rate
Operating hours before replacement (or, catalyst life)
Catalyst specific surface area

Two important differences in the assumptions made by EPA in its estimate of catalyst volume and those made by Sargent & Lundy in their estimated volume of catalyst are the lifetime and the deactivation rate. Sargent & Lundy at 17 states that with the catalyst life changed to 32,000 hours and the catalyst deactivation rate increased, ATP's worksheet produces similar results as Sargent & Lundy's analysis. Sargent & Lundy also acknowledges at 18 that 32,000 hours of operating time between catalyst changes is not typical. Therefore, it is reasonable to explore these two assumptions of deactivation rate and catalyst life in more detail.

v. *Catalyst Life*

Sargent & Lundy at 18 states:

[459] NO_x -SCR_$ton in the workbook UT_EGU_BART Costs.xls that was developed by ATP.

> "If PacifiCorp was required to take an extra week long outage every two years in accordance with Andover's presumed 16,000 hours of catalyst life, then the cost-effectiveness calculations would need to include the cost of replacement power for that extra outage, which are currently not included."

Actually, at 16,000 operating hours between catalyst replacements, one *additional* week long outage may be required every *four* years since one of the two catalyst changes every four years would be performed during the major outage scheduled every four years. EPA examined operating data for the Hunter and Huntington stations.[460] Figures 3a and 3b show MWh of generation for each unit over the five year period 2011-2015. As demonstrated by drops in MWh generated per month, these confirm a trend toward major outages every roughly 3-4 years. However, the data also indicates smaller outages at more frequent intervals – typically resulting in drops of about 50,000 MWh or more in a month. At roughly 450 MW, the units generate up to roughly 10,800 MWh per day, indicating that 5 day or longer outages typically occur each year for each unit. Figures 4a and 4b show total outage hours for each of the units over the same five year period. Except for Hunter Unit 2, each of the BART units was out of service for more than a week every two years. Therefore, a week-long period for replacing catalyst would not likely increase the outages that would otherwise occur by a full seven days. In fact, it would likely increase the outage by much less than seven days, if at all.

EPA examined the cost of replacement power, using data on the cost of replacement power and cost of fuel per MWh from PacifiCorp's EIA Form 1.[461] For seven days at average capacity factor, it would be roughly one million dollars per outage, or about a quarter million annually. But, this is likely much too high because:

- Both plants are multi-unit plants, and one unit could likely compensate for the unit having the outage, making replacement power unnecessary.

- As noted earlier in these responses to comments, the additional outage would likely be combined with outages that would otherwise have occurred, making the seven day assumption a worst-case value.

Therefore, EPA has determined that this would have a cost impact of no more than about $250,000 on an annualized basis and likely much less. With a more reasonable extension of two days (since historical data shows an outage of 5 days or more occurs each year for most of the units), the cost is likely to be about $70,000 annualized, if not less because these are multi-unit plants. This cost must be balanced against the higher cost associated with installing enough catalyst to achieve 32,000 operating hours until the first catalyst replacement.

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[460] The comment states: "PacifiCorp has committed itself to reducing maintenance outage frequency to every four years; therefore, they intend to replace catalyst outage with that frequency." Regardless of PacifiCorp's intent, it is reasonable for us to use recent data to examine outage frequency – that is an objective measure, as opposed to subjective intent. Of course, an announced intent that has the effect of increasing SCR costs might make a dubious basis for an estimate, due to the potential for a self-serving announcement. In any case, we are conservatively allowing a 32,000 hour replacement frequency.

[461] FERC Form 1, Quarter 4, 2014, pages 326-327, rows 2-4, cost of replacement power calculated by dividing the total cost by MWh. Cost of fuel pages 402.1, 403.1, 402.2, line 43.

A more common replacement frequency of 16,000 hours may, therefore, be preferable to 32,000 hours upon closer examination of the economics and other factors. Nevertheless, in estimating the cost of the SCR, to be conservative EPA will allow for a 32,000 hour catalyst replacement frequency in estimating the volume of catalyst. We reference costs based on the conservative assumption of a 32,000 hour replacement frequency when comparing cost-effectiveness values for our BART determination for Hunter and Huntington with values for other BART determinations.

Figure 3a. Hunter Megawatt hours generated by month (source: EIA Form 960)

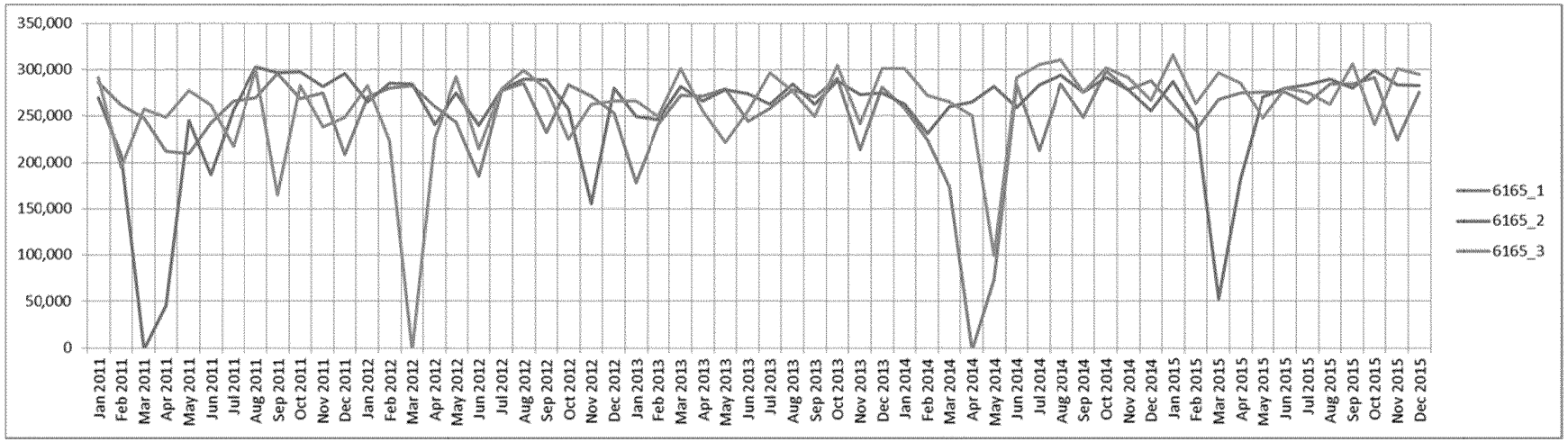


Figure 3b. Huntington Megawatt hours generated by month (source: EIA Form 960)

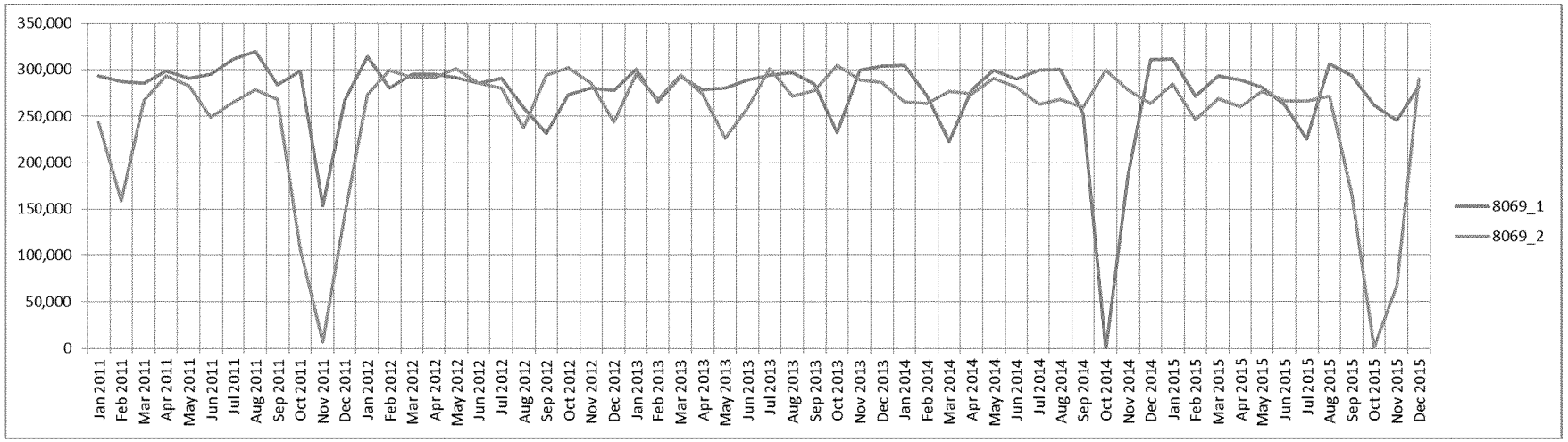


Figure 4a. Hunter hours out of service per year (source: US EPA Air Markets Program Data)

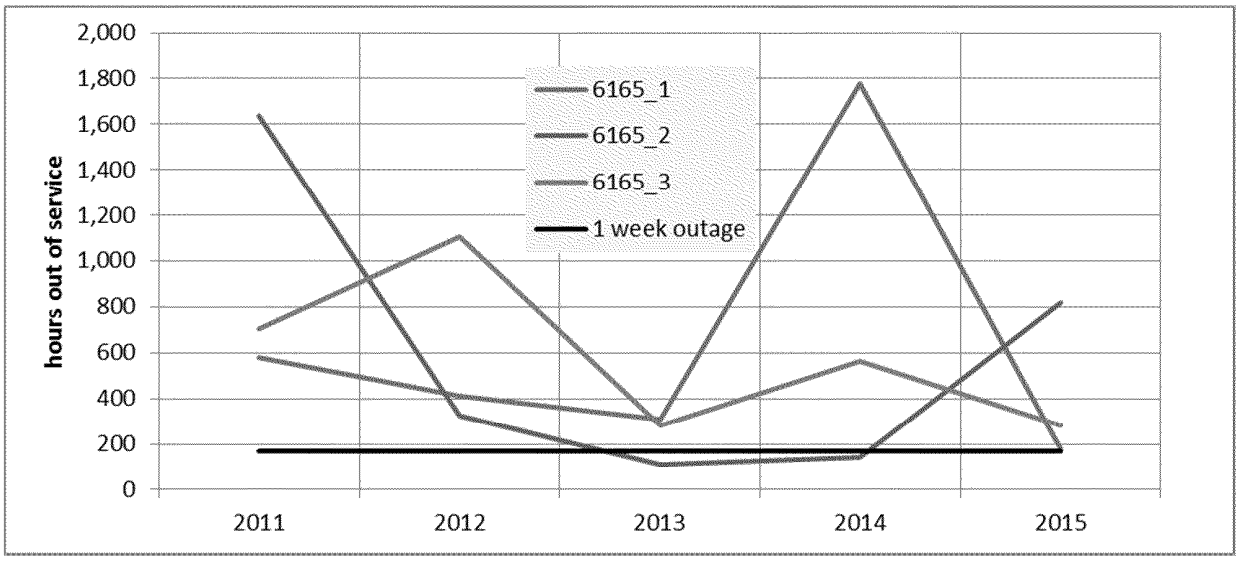
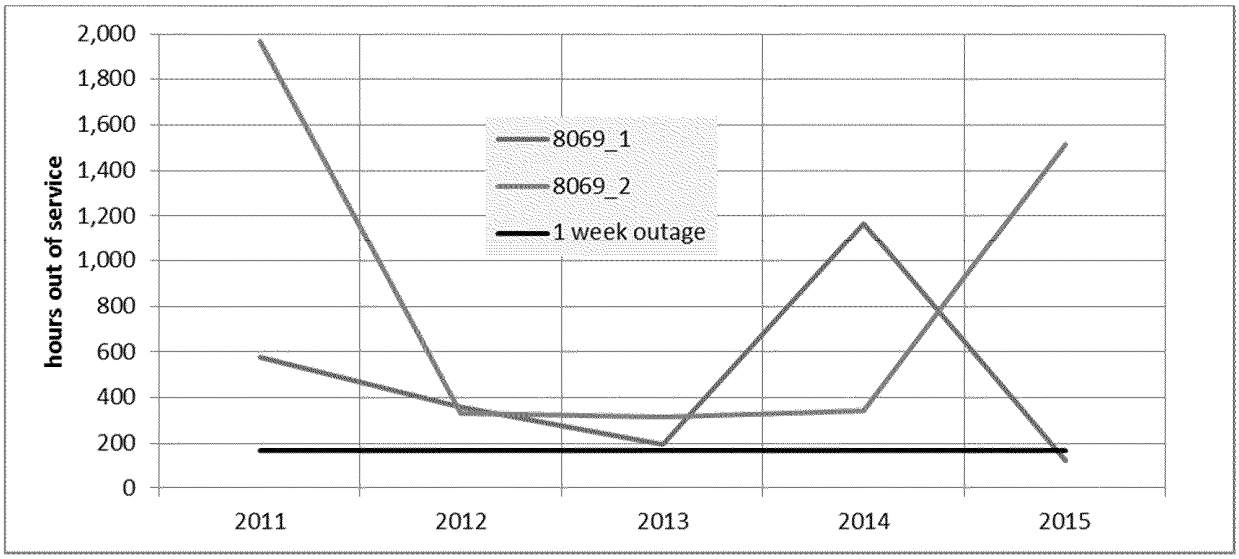


Figure 4b. Huntington hours out of service per year (source: US EPA Air Markets Program Data)



vi. Deactivation rate

Deactivation rate is an important parameter in determining catalyst loading because the SCR must have adequate catalyst activity after a determined operating time. ATP used a deactivation rate that was consistent with the lower rate for bituminous coals and the upper range for PRB coals, or a rate equivalent to resulting in activity being 70% of new catalyst (k/ko = 0.70) after 16,000 hours of operation. In the 2002 CCM, this factors into Equations 2.2, 2.16a and 2.19 when determining catalyst volume.

In its report, ATP examined the concentration of deactivating species relative to both eastern bituminous and Powder River Basin (PRB) coals and determined that the Utah coals had favorable characteristics relative to these coals for the deactivating species. For this reason, a deactivation rate corresponding to a k/ko of 0.70 after 16,000 hours – which is on the faster side of the deactivation rate for eastern bituminous fuels and on the lower end of the deactivation rate for PRB fuels. Examination of the same coal quality database also shows that phosphorus content in Utah coals on average is about midway between the content for eastern bituminous and PRB fuels. Table 5 shows the average amount of P_2O_5 in the fly ash per million BTU of coal. Therefore, there is a risk of phosphorus deactivation, but it is less than expected for PRB fuels. Methods to mitigate phosphorus deactivation are also available and have been discussed elsewhere in these responses to comments. By contrast, PacifiCorp and Sargent & Lundy have not provided any discussion of any analysis they performed on content of deactivating species.

For this reason, EPA's use of a deactivation rate corresponding to a k/ko of 0.70 after 16,000 hours is supported.

This concern over phosphorus poisoning that Sargent & Lundy and PacifiCorp have raised, if it proves to be a concern, would also argue for a more frequent catalyst replacement frequency and lower catalyst loading. Deactivation by gas-phase phosphorus is most problematic in the lower layers of the SCR reactor where ammonia concentrations are lower.[462] Therefore, should this actually be an issue in the Hunter or Huntington units that was not rectified by the addition of iron-bearing material to the fuel, the additional catalyst would more rapidly deactivate, making it preferable to have a lower catalyst loading and more frequent catalyst replacements than a larger catalyst loading with more "excess" catalyst.

Table 5. P_2O_5 in fly ash, expressed in lb/MMBtu of coal heat input [463]

	Bit	UT	PRB
Lb P_2O_5/MMBtu	3.82E-03	6.23E-03	9.17E-03

As noted in these response to comments, the impact of deactivation rate and replacement frequency have a major role in determining the volume of catalyst, and EPA expects that with more realistic replacement frequency assumptions and deactivation rates a catalyst volume of roughly half of what Sargent & Lundy estimated would result. Nevertheless, to be conservative in estimating cost EPA will allow for the larger volume catalyst estimated by Sargent & Lundy along with the longer time between layer replacement indicated by PacifiCorp. We reference costs based on the conservative assumption of a larger volume of catalyst when comparing cost-effectiveness values for our BART determination for Hunter and Huntington with values for other BART determinations.

[462] Gadgil, M., Pierson, L., Hansen, E., Silbaugh, D., Meier, J., "Improvement in Performance of SCR Catalyst Using Combustion Additives: Technology Status Update, 2012 Mega Symposium, Presentation #2, slide 9.
[463] See Excel workbook USGS_PA_UT_WY_P2O5.xls.

vii. SCR Reactor Design

EPA agrees with PacifiCorp and Sargent & Lundy that gas flowrate is an important factor in the SCR reactor design. EPA's calculations indicate that an inlet velocity of 16 ft/s (4.88 m/s) is achieved with a single SCR reactor with an inner dimension no larger than 52 feet on each side (smaller, if Sargent & Lundy's flow estimate is used). In its earlier analysis, EPA mistakenly assumed that Sargent & Lundy's SCR reactors (2 per boiler) were designed to be up to 50 foot by 50 foot (up to about 5,000 square feet or 465 square meters total), or about double the cross sectional area necessary. Based upon that, EPA estimated that one of the SCR reactors could be eliminated. EPA has corrected this error in this more recent effort. But, as EPA's analysis demonstrates, even two 40 foot by 40 foot cross section SCR reactors, as assumed by Sargent & Lundy, appear to be more than necessary.

Nevertheless, EPA's assessment is that a single reactor of about 50 feet by 50 feet would serve the needs of the facility and could be constructed is supported by other installations. For example, each of the Belews Creek SCR reactors (Figures 5a and 5b), each handling the equivalent flue gas volume of 560 MW (not adjusted for the 819 ft elevation) have outer dimensions of roughly 58 feet by 58 feet. Inner dimensions would be somewhat less due to the reactor casing, insulation, etc. Each of the TVA's Cumberland SCR reactors (Figure 6), handling roughly 630 MW of gas flow have outer dimensions of roughly 70 feet by 70 feet. Each SCR reactor of TVA Paradise 3 (Figure 7) handles about 575 MW of flue gas and has outer dimensions of about 50 feet by 70 feet.[464] Therefore, if the Hunter and Huntington units handle a volume flowrate roughly equivalent to a 540 MW unit at sea level, it would be reasonable to expect that a single reactor about 52 feet by 52 feet (internal dimensions) would be adequate and could be built. EPA's earlier assumption that PacifiCorp could have used a single SCR reactor was therefore not without technical justification.

The decision to use one large reactor or two smaller ones will depend upon factors such as structural requirements and site constraints. Furthermore, it is common for SCRs to be constructed with the SCR reactor above the PM control devices, as shown in Figures 5a through 7. This is the most common arrangement for side-by-side units, such as Hunter 1&2 and Huntington 1&2. This has a benefit of minimizing the amount of ductwork needed. In this configuration the use of two SCR reactors is sometimes preferred. However, with the SCR reactors built to the side of the boiler, as proposed by Sargent & Lundy for Hunter 1&2 and Huntington 1&2, [465] one SCR reactor might be possible. This is possible even with two ducts feeding the SCR reactor, as shown in the photo of the SCR at the Merrimack power plant in New Hampshire, which is built to the side of the boiler and shown in Figure 8. Therefore, it is possible

[464] Dimensions are represented as approximate and are estimated using Google Earth ruler, which ATP has confirmed on other projects can be accurate to within about a foot for similar power plant equipment dimensions.
[465] PacifiCorp's BART Analysis Update for Hunter Units 1 and 2 and Huntington Units 1 and 2, August 5, 2014, pp 79, 114.

that a more cost-optimized design for the Hunter and Huntington units might result in either a single reactor design built to the side or a design with the SCR reactor(s) elevated over the PM control devices, but with shorter ductwork runs. Although EPA believes that two 40 foot by 40 foot SCR reactors per unit are more than what is necessary and that a more cost-optimized design might be different, to be conservative with respect to cost, EPA has made a determination to allow for the two 40 foot by 40 foot SCR reactors built to the side of the respective boilers. That is, EPA has accepted the both the catalyst volume and SCR design suggested by Sargent & Lundy.

Figure 5a. 2240 MW Duke Energy's Belews Creek[466]

Figure 5b. SCRs on one of the 1120 MW Belews Creek Units (outer dimensions about 58 feet by 58 feet per SCR reactor)

[466] Duke Energy's photostream, http://www.flickr.com/photos/dukeenergy/tags/scr/.

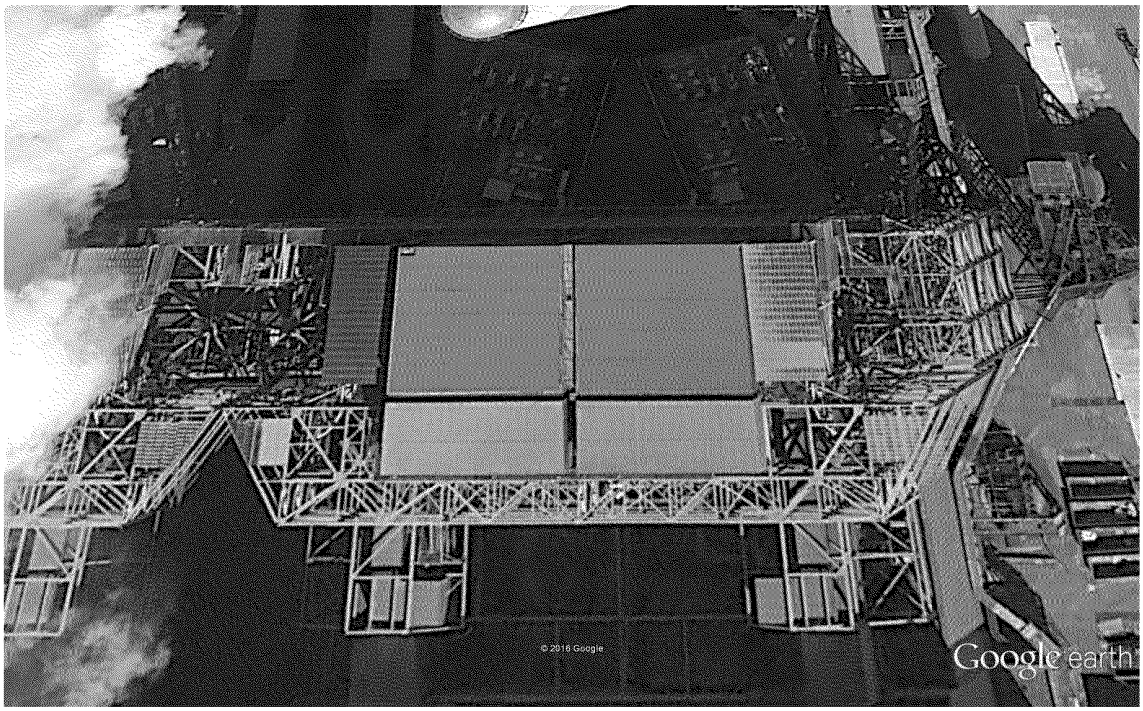


Figure 6. 2530 MW TVA Cumberland Power Plant (roughly 70 feet by 70 feet per reactor)

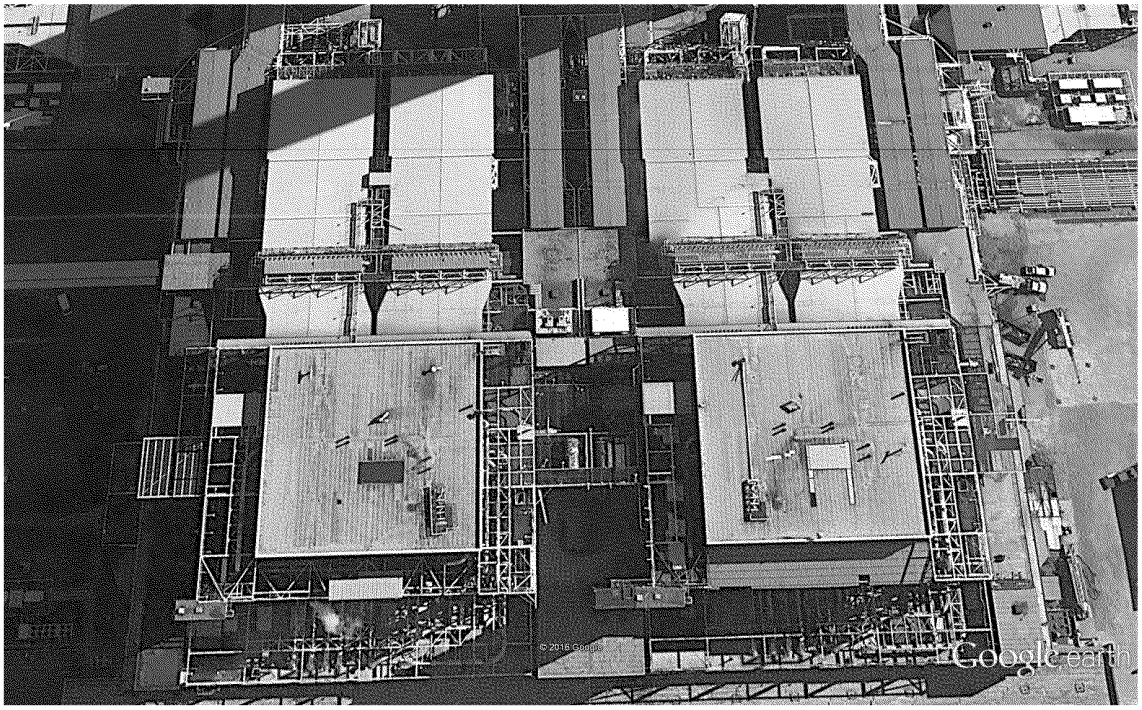


Figure 7. 1150 MW Paradise 3, (roughly 70 feet by 50 feet per SCR reactor)

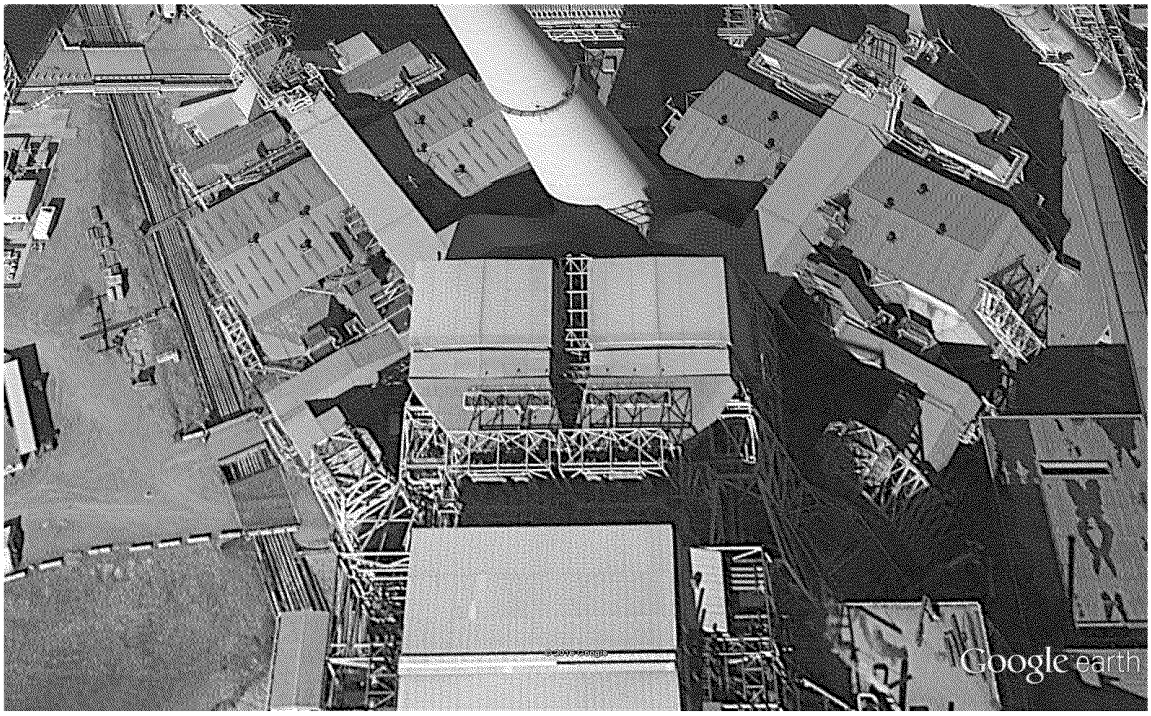
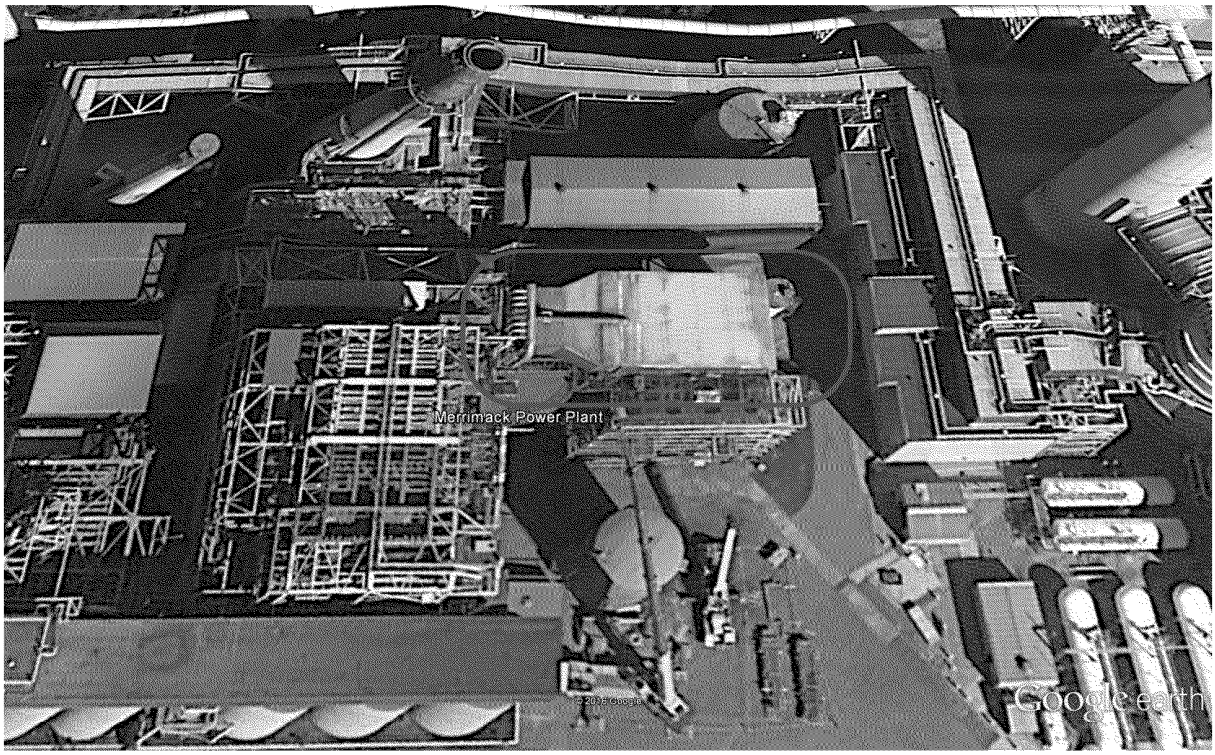


Figure 8. Merrimack Power Plant equipped with single reactor SCR to the side of the boiler.



viii. *ATP wrongly modified ID fan costs in the SCR cost estimates*

Comment: [S&L, pp. 20-21] Cost of Induced Draft (ID) Fan and Auxiliary Load

Andover Report: Sargent & Lundy over-estimated the cost of the fans used in the PacifiCorp submittal. [467]

S&L Response:

Andover correctly points out that in some cases improvements to the existing ID fans can be sufficient to overcome the differential pressure required by SCR systems retrofitted to existing plants. For those rare cases, the original ID fans were typically designed to accommodate a future SCR system, so they generally already included significant operating margin. Based on the information available when we prepared the study level SCR cost estimates for Hunter and Huntington, new ID fans were determined to be required at all four units at both stations. Andover compared the size of the new motors (two 6000 HP motors for each unit) used to develop capital cost estimates to the additional auxiliary power consumption added by the SCR system (2100 to 2200 kW) used to estimate O&M costs, and mistakenly concluded that the fans included in S&L's estimates were oversized.

[467] *Andover Report*, pg. 18.

Because new ID fans were determined to be required, new ID fans must be designed to handle the entire flue gas flow and designed to overcome, not only the additional pressure drop from the SCR, but also to overcome the differential pressure for which it was originally designed (e.g. air preheaters, ESPs, etc.). For each unit, 2 x 50% ID fans were included in the capital cost estimate.

The lower auxiliary power numbers referenced above were utilized to prepare the O&M costs associated with the SCR systems so that the cost-effectiveness calculations only reflected the incremental increase in auxiliary power costs due to the SCR project. Andover's misunderstanding of the difference between the capital and O&M costs associated with the ID fans led them to make incorrect inferences regarding S&L's assumed fan and motor efficiencies, which further led them to incorrectly adjust the capital costs. Andover's capital cost adjustment is based on sizing the new ID fans for the incremental auxiliary power consumption due only to the SCR differential pressure, which is not technically feasible. Therefore, S&L's capital cost estimates regarding the ID fans are correct and the adjustments by Andover are not appropriate.

Response: ATP and EPA initially expected that the fan was a booster fan simply to overcome the additional pressure drop. Since PacifiCorp has clarified in its comments that the fan is a replacement to the existing ID fan, EPA has allowed for the full cost of the fan as indicated by PacifiCorp.

Comment: [S&L, p. 21] Operating Cost – Cost of Generating Steam for Hydrolyser
We agree that using fuel costs for steam costs is appropriate. Assuming the fuel costs indicated by Andover are correct, this impacts the cost-effectiveness calculation by less than 0.25%.

Response: Comment noted.

Comment: [S&L, pp. 21-22] Revised Reagent Consumption

Andover used equations from the EPA 2015 revision to its *Control Cost Manual* to calculate reagent consumption which impacts both the capital and O&M costs. At this time, EPA has not finalized this revision; even so this revision does not apply to this BART evaluation as it was completed in 2011, prior to the proposed changes. The proposed equations are incorrect and underestimate the reagent consumption and result in lower O&M costs for the reagent, water, and steam as well as lower inventory capital costs.

Response: We disagree. Equation 2.35 of the 2015 revision to the CCM is the same as equation 2.32 in the 2002 CCM. The difference between the urea demand predicted by EPA and that predicted by Sargent & Lundy is the result of the higher inlet NO_x level to the SCR assumed by Sargent & Lundy of 0.26 lb/MMBtu[468] versus the historical NO_x emissions that EPA used. The

[468] PacifiCorp's BART Analysis Update for Hunter Units 1 and 2 and Huntington Units 1 and 2, August 5, 2014, line 14 on, pp 20, 26, 32, 38.

difference in resulting urea flowrate has implications for other costs, such as urea hydrolyzer steam and water. Annualized flows are also impacted by the capacity factor used in the cost analysis. EPA used historical capacity factors while Sargent & Lundy used 90%.[469]

Comment: [S&L, p. 22] Removal of Owner's Costs
Andover's report indicates that the "capital cost estimates do not include AFUDC or Owner's costs (beyond the 10% allowed for engineering and home office)."[470] Engineering and home office fees are Contractor costs which cover the detailed engineering for the project as well as the Contractor's home office fees. Owner's costs are outside of the total Contractor cost and are real costs that the Owner will incur during the project such as services procured from third parties, and other project related costs.

Response: Refer to our response regarding owner's costs elsewhere in this document.

Comment: [S&L, pp. 23-24] Table 2 summarizes the capital costs incorrectly excluded for each unit by Andover which should be included in the overall SCR control cost.

[469] Ibid, line 12 pp 20, 26, 32, 38.
[470] *Andover Report*, pg. 24.

Table 2: Excluded Costs by Andover from SCR Total Capital Investment (TCI)

Ref	Item	Hunter 1	Hunter 2	Huntington 1	Huntington 2
1	**Process Contingency**	**6,243,797**	**6,147,361**	**6,083,691**	**6,112,941**
2	**Project Contingency**	**22,477,668**	**22,130,498**	**21,901,287**	**22,006,586**
3	**General Facilities**	**6,243,797**	**6,147,361**	**6,083,691**	**6,112,941**
4	**AFUDC**	**0**	**0**	**0**	**0**
5	**Sales Taxes**	**0**	**0**	**0**	**0**
6	**Property Tax**	**2,764,009**	**2,773,612**	**1,864,732**	**1,863,726**
7	**Indirect Installation Costs**	**6,068,143**	**5,748,330**	**5,564,981**	**5,608,258**
	Contractor Construction Management/Field Engineering	1,085,350	1,092,950	1,095,850	1,099,550
	Contractor Training Classes	135,000	135,000	135,000	135,000
	Engineering and Home Office Fees	3,371,711	3,112,193	2,965,375	2,995,130
	G. - Preproduction Costs	1,441,082	1,373,187	1,333,756	1,343,578
	I. - Initial Catalyst and Chemicals (Inventory Capital)	35,000	35,000	35,000	35,000
8	**Catalyst and Catalyst Reactor**	**18,543,185**	**18,578,205**	**18,691,324**	**18,738,385**
	IB. Total SCR Build	11,498,889	11,498,889	11,498,889	11,498,889
	IIB. Total - Other Direct Costs SCR Build	3,469,285	3,504,305	3,617,424	3,664,485
	a. Total - Other (Initial Load Catalyst)	3,575,011	3,575,011	3,575,011	3,575,011
9	**Cost of ID Fan and Auxiliary Load**	**837,649**	**895,820**	**882,108**	**908,889**
	ID Fan Cost (IB. Total SCR Build)	837,649	895,820	882,108	908,889
10	**Operating Cost (Steam)**	**O&M Only**	**O&M Only**	**O&M Only**	**O&M Only**
11	**Additional Andover Adjustments**	**4,934,548**	**4,345,379**	**4,935,661**	**4,344,522**
	H. - Inventory Capital - Urea Consumption	22,547	26,878	23,660	26,021
	a. Total - Other - Owner's Cost	4,912,001	4,318,501	4,912,001	4,318,501
TOTAL EXCLUDED CAPITAL COST ($)		**68,112,796**	**66,766,566**	**66,007,475**	**65,696,248**
Total Delta Annualized Capital ($/yr)		**6,429,848**	**6,302,764**	**6,231,106**	**6,201,726**

Ref	Item	Hunter 1	Hunter 2	Huntington 1	Huntington 2
Andover Report SCR Only TCI[55]		$98,752,028	$99,495,445	$99,720,288	$100,040,436
Adjusted *Andover Report* SCR Only TCI		**$166,864,824**	**$166,262,011**	**$165,727,763**	**$165,736,684**

[55] *See,* Andover_ NO_x_control_costs,_October_22,_2015.xlsx worksheet " NO_x - SCR_$ton," at row 56.

Response: A partial response to this comment is provided in the FRN. In separate responses, we have addressed each of the capital costs that the commenter alleges that Andover incorrectly excluded. In particular, note that in our revised cost analysis, EPA has accepted both the catalyst

volume and SCR design suggested by Sargent & Lundy which are conservative assumptions. However, we continue to reject process and project contingency costs and other costs that are double counted, not permissible under the CCM, or are otherwise not justified. Also, refer to the final Andover report and spreadsheet for further details regarding how each of these costs was addressed in the cost analysis support this rulemaking.

Comment: [S&L, p. 24] Table 3 summarizes the O&M costs incorrectly excluded for each unit by Andover which should be included in the overall SCR control cost. By incorrectly removing the capital costs as defined in Table 2, Andover also reduced the fixed maintenance O&M costs by nearly $2 million per unit. Andover arbitrarily adjusted the property taxes without proper justification, the adjustment included in Table 3 accounts for the differential between the value included in the *2014 BART Report* and that estimated by Andover. As discussed previously in the response to Andover's comment #8 the adjustments made to the catalyst volume are incorrect and have no basis, therefore the reduction in O&M costs is not justified; the cost in Table 3 represents the differential between the *2014 BART Report* and the *Andover Report*. Per Andover's comment #10, the reduction in steam unit price results in a small reduction in O&M costs and therefore no adjustment was made to the Andover costs. Finally, additional adjustments were incorrectly made by Andover as described in Item #11; these are also included in Table 3.

Table 3: Excluded Costs by Andover from SCR Total Annual O&M Costs

Ref.	Item	Hunter 1	Hunter 2	Huntington 1	Huntington 2
1-9	**O&M Costs Affected by Capital Cost**	**1,985,063**	**1,971,993**	**1,961,003**	**1,959,105**
	Maintenance Cost	2,044,314	2,031,690	2,020,835	2,019,129
	Administrative Charges	(59,251)	(59,697)	(59,832)	(60,024)
6	**Property Taxes**	**1,110,892**	**1,100,579**	**1,092,769**	**1,090,814**
8	**Catalyst and Catalyst Reactor**	**169,530**	**169,530**	**169,530**	**169,530**
11	**Additional Andover Adjustments**	**807,719**	**854,190**	**814,287**	**887,169**
	Reagent Cost	789,106	833,837	797,411	866,996
	Water Cost (For Reagent)	900	1,010	874	1,045
	Steam Cost (For Reagent)	17,713	19,343	16,001	19,128
TOTAL EXCLUDED O&M COST ($/yr)		**4,073,204**	**4,096,292**	**4,037,588**	**4,106,617**
Andover Report SCR Only Total Annual Operating Cost (Fixed and Variable)[56]		$3,101,280	$2,960,484	$3,080,187	$2,988,621
Adjusted *Andover Report* SCR Only Total Annual Operating Cost		**$7,174,484**	**$7,056,776**	**$7,117,775**	**$7,095,238**

[56] Calculated by adding Annual Operating and Fixed Operating Costs. *See,* Andover_ NO_x_control_costs, _October_22,_2015.xlsx worksheet "SC_PacifiCorp Annual_Adjusted," at row 108 and " NO_x - SCR_$ton," at row 92.

Response: In separate responses, we have addressed each of the capital costs that the commenter alleges that Andover incorrectly excluded. Thus, any O&M costs affected by capital costs are

similarly addressed by those responses. Likewise, the additional adjustments made by Andover are addressed in other responses in this document.

Comment: [UARG, pp. 20-21] The rationale underlying EPA's proposed FIP is also seriously flawed in significant respects. For instance, EPA asserts that the BART Guidelines require estimation of costs of compliance consistent with its Air Pollution Control Cost Manual ("CCM"). *Id.* at 2032, 2041. On that basis, EPA proposes to reject specific cost items that were reported to the Agency by the operator of the units that are the subject of the proposed rule "to account for items that . . . should not be allowed under the CCM, such as an allowance for funds used during construction (AFUDC)." *Id.* at 2034 (footnote omitted); *see also id.* at 2039, 2042, 2046 (footnotes omitted).

The BART Guidelines make clear the nonbinding nature of the CCM and the CCM's methodology; they state that the basis for BART control-equipment cost estimates "should be documented, *either* with *data supplied by an equipment vendor* (*i.e.*, budget estimates or bids) *or* by *a referenced source* (*such as* the *OAQPS Control Cost Manual* . . .)." 70 Fed. Reg. at 39,166 (emphases added) (footnote omitted). BART determinations properly take into account

> additional information . . . used for the cost calculations, including any information supplied by vendors that affects . . . assumptions regarding purchased equipment costs, equipment life, replacement of major components, and any other element of the calculation that *differs from* the *Control Cost Manual*.

Id. at n.15 (emphasis added). Similarly, the BART rule's preamble says merely that EPA "believe[s]" that the CCM

> provides *a* good *reference tool* for cost calculations, *but* if there are *[cost] elements or sources that are not addressed by the Control Cost Manual* or there are *additional cost methods* that could be used, we [*i.e.*, EPA] believe that these could serve as useful supplemental information.

Id. at 39,127 (emphases added). Thus, the CCM is "a . . . reference tool" but is not binding in any way.[471] Indeed, EPA ignores the critical fact that the CCM was never subjected to notice-and-comment rulemaking and thus, as a legal matter, *cannot* be binding, *see, e.g., Thomas v. New York*, 802 F.2d 1443, 1446-47 (D.C. Cir. 1986) (per Scalia, Circuit Judge), and EPA lacks any legitimate basis for excluding from BART analyses real-world costs identified by facility owners and operators.

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[471] Regarding design parameters for emission controls, the BART Guidelines call for "documentation of . . . assumptions regarding design parameters" and explain that the CCM would be one – but only one – "*[e]xample[]* of [a] supporting reference[]" that could be used for such documentation. 70 FR 39104, 39166 (July 6, 2005) (emphasis added).

Response: We disagree. First, the commenter does not dispute that application of the BART Guidelines to the Hunter and Huntington BART units is mandatory, because Hunter and Huntington are each fossil-fuel fired power plants with total generating capacity greater than 750 megawatts. See 40 CFR 51.308(e)(1)(ii)(B).

The BART Guidelines in turn state:

> The basis for equipment cost estimates also should be documented, either with data supplied by an equipment vendor (*i.e.*, budget estimates or bids) or by a referenced source (such as the *OAQPS Control Cost Manual,* Fifth Edition, February 1996, EPA 453/B-96-001). **In order to maintain and improve consistency, cost estimates should be based on the *OAQPS Control Cost Manual*, where possible.** The *Control Cost Manual* addresses most control technologies in sufficient detail for a BART analysis. The cost analysis should also take into account any site-specific design or other conditions identified above that affect the cost of a particular BART technology option.

40 CFR part 51, Appendix Y, IV.D.4.a,5 (bold, underlined emphasis added). The emphasized text is omitted by the commenter.

We stated in our proposal, "*In accordance with the BART Guidelines*, we have estimated the costs of compliance consistent with the EPA Air Pollution Control Cost Manual (CCM)." E.g., 81 FR 2032. Based on the above quote from the Guidelines, it is patently obvious that estimating the cost of compliance consistently with the CCM is "in accordance" with the Guidelines. Thus, the commenter is incorrect in stating: "EPA asserts that the BART Guidelines *require* estimation of costs of compliance consistent with its Air Pollution Control Cost Manual." We acknowledge that States (and EPA in promulgating a FIP) may deviate from the Control Cost Manual provided their analysis is reasonable and the deviations are documented. See 79 FR 5087/3-88/1; *Oklahoma v. U.S. EPA*, 723 F.3d 1201, 1212-15 (10th Cir. 2013).

Thus, the commenter's argument that the CCM is not binding because it allegedly did not go through notice-and-comment is irrelevant, because we are not relying on any alleged binding nature of the CCM in developing our cost estimates. Under the BART Guidelines, as explained above, we have the *discretion* to deviate (or not) from the CCM, so long as our analysis is reasonable and deviations are documented. We further note that our use of the CCM in today's action has undergone notice-and-comment, and the public has had full opportunity to comment on it.

We have properly taken into account additional (i.e. outside the CCM) information when it is warranted to use it in our cost estimates, and rejected additional information when it was not warranted to use it in our cost estimates. The details of this are explained in our cost analyses and elsewhere in this response to comments. Thus, the commenter's quotes about additional and supplemental information are to no avail, as the comment fails to identify any additional or supplemental information that EPA failed to reasonably consider.

The one specific cost item commenter does take issue with is our disallowance of the use of AFUDC. In our proposal, we did not simply rely on the CCM. We also cited the discussion of reasons for disallowing AFUDC in the notice for our final Wyoming action. 81 FR 2034/3 n.187 (citing 79 FR 5032, 5133 (Jan. 30, 2014)). In the Wyoming notice, we explained:

> The utility industry uses a method known as ''levelized costing'' to conduct its internal comparisons, which is different from the methods specified by the CCM. Utilities use ''levelized costing'' to allow them to recover project costs over a period of several years and, as a result, realize a reasonable return on their investment. The CCM uses an approach sometimes referred to as overnight costing, which treats the costs of a project as if the project were completed ''overnight'', with no construction period and no interest accrual. Since assets under construction do not provide service to current customers, utilities cannot charge the interest and allowed return on equity associated with these assets to customers while under construction. Under the ''levelized costing'' methodology, AFUDC capitalizes the interest and return on equity that would accrue over the construction period and adds them to the rate base when construction is completed and the assets are used. Although it is included in capital costs, AFUDC primarily represents a tool for utilities to capture their cost of borrowing and return on equity during construction periods. AFUDC is not allowed as a capitalized cost associated with a pollution control device under CCM's overnight costing methodology, and is specifically disallowed for SCRs (i.e., set to zero) in the CCM. Therefore, in reviewing other BART determinations, EPA has consistently excluded AFUDC.

79 FR 5133/2-3. The Wyoming action quoted our notice for our North Dakota action, which explained: "we maintain that following the overnight method ensures equitable BART determinations." 77 FR 20894, 20916-17 (Apr. 6, 2012). In the notice for an Arizona action, EPA gave a full explanation of why the overnight method is preferred:

> We consider the use of the broader costing methodology used by the CCM, the overnight method, as crucial to our ability to assess the reasonableness of the costs of compliance. Evaluation of the cost of compliance factor requires an evaluation of the cost-effectiveness associated with the various control options considered for the facility. A proper evaluation of cost-effectiveness allows for a reasoned comparison not only of different control options for a given facility, but also of the relative costs of controls for similar facilities. If the cost-effectiveness of a control technology for a particular facility is outside the range for other similar facilities, the control technology may be rejected as not cost-effective. In order for this type of comparison to be meaningful, the cost estimates for these facilities must be performed in a consistent manner. Without an apples-to-apples' comparison of costs, it is impossible to draw rational conclusions about the reasonableness of the costs of compliance for particular control options. Use of the CCM methodology is intended to allow a fair comparison of pollution control costs between similar applications for regulatory purposes. This is why the BART guidelines

> specify the use of the CCM where possible and why it is reasonable for us to insist that the CCM methodology be observed in the cost estimate process. However, we note that the overnight method has been used for decades for regulatory control technology cost analyses, and that its use ensures equitable BART determinations across states and across sources.

77 FR 72512, 72531 (Dec. 5, 2012). We adopt this explanation, and we note that the Ninth Circuit Court of Appeals quoted it in upholding the cited action. *Ariz. ex rel. Darwin v. U.S. EPA*, 815 F.3d 519 (9th Cir. 2016). The Court stated:

> Not satisfied, [Petitioner] contends that in its supplemental analysis, "EPA excluded costs it deemed inconsistent with the [Cost Manual]" such as Allowance for Funds Utilized During Construction ("AFUDC"). This argument restates Petitioners' objections to EPA's reliance on the overnight costing methodology when it partially disapproved Arizona's SIP. EPA's use of such a methodology in *its own FIP's* cost analysis is, without doubt, reasonable. *See* 77 Fed. Reg. at 72,518.
>
> In rejecting Arizona's SIP, EPA explained that the use of the overnight method was "crucial to [its] ability to assess the reasonableness of the costs of compliance." *Id.* The agency went on:
>
>> A proper evaluation of cost-effectiveness allows for a reasoned comparison not only of different control options for a given facility, but also of the relative costs of controls for similar facilities. If the cost-effectiveness of a control technology for a particular facility is outside the range for other similar facilities, the control technology may be rejected as not cost-effective. . . . Without an 'apples-to-apples' comparison of costs, it is impossible to draw rational conclusions about the reasonableness of the costs of compliance for particular control options. Use of the [Cost Manual] methodology is intended to allow a fair comparison of pollution control costs between similar applications for regulatory purposes.
>
> EPA concluded that "it is reasonable for us to insist that the [Cost Manual] methodology be observed in the cost estimate process." Accordingly, it rejected comments that items like AFUDC should have been incorporated into its cost analysis, as they were "inconsistent with [the Cost Manual] methodology."
>
> EPA's analysis is reasonable. The purpose of the cost analysis required as part of a BART determination is to foster comparison of the cost of the visibility improvements enabled by various control technologies. As EPA's comments indicate, cross-facility comparisons of similar sources with regard to the cost-effectiveness of a given control option aid in determining cost-effectiveness at a specific source. Control options are likely to impact similar sources similarly; comparisons assure that the cost and benefit figures used for a particular site are realistic, rather than inflated in one direction or another. Consideration of AFUDC would not further this inquiry, as AFUDC is ultimately reflective of the

> implementing entity's financial and logistical situations, grounded in past decisions and in the company's financial policies and attitudes, not of the hard costs of the equipment and construction, which should be consistent across sites. While AFUDC and similar concepts are relevant for sales and ratemaking, including them would undermine the sort of "apples-to-apples" comparison that EPA asserts is necessary as part—but only part—of assessing the control options.
>
> This approach is consonant with the Guidelines, which specifically advise that "reasonable range[s]" for cost effectiveness are those that are "consistent with the range of cost effectiveness values used in other similar permit decisions over a period of time." Guidelines at 39,168; *see also* Oklahoma, 723 F.3d at 1213 ("The guidelines say that states should follow the manual's methodology so that projects can be more easily compared."). Moreover, adopting a costing methodology which focuses on achieving consistency and facilitating comparisons aligns with the CAA itself, which empowers EPA to promulgate *national* regulations concerning BART determinations. *See* 42 U.S.C. § 7491(a)(4), (b)(1).

Arizona ex rel. Darwin, 815 F.3d at 540-41. We reiterate that the Ninth Circuit stated here: "EPA's use of [overnight costing] methodology in *its own FIP's* cost analysis is, without doubt, reasonable." *Id.* The commenter has not shown otherwise.

Comment: [Conserv Orgs, p. 20] The Visibility Benefits of SCR are Substantial and Warrant SCR as BART on Hunter and Huntington Unlike Utah's SIP analysis, EPA's CALPUFF visibility modeling complies with EPA regulations and guidelines and is consistent with other EPA BART determinations. For example, without EPA approval, PacifiCorp installed new LNB controls at each of the BART units over the time period of 2006-2014.[472] PacifiCorp installed these new LNB controls prior to a formal BART determination, which could have unfairly influenced the BART analysis process. EPA rejected PacifiCorp's strategy and instead correctly assessed baseline emissions from the mandated 2001-2003 baseline period—prior to the installation of NO_x controls at the BART units.

Response: We agree that the visibility benefits of SCR on the four BART EGUs is substantial and warrant SCR as BART. Refer to our response to comments elsewhere, particular those that relate to our selection of BART.

Please refer to our response regarding the differences between EPA's and Utah's CALPUFF modeling in section 2.f above.

Comment: [Conserv Orgs, p. 20] Consistent with EPA regulations and guidelines, EPA also appropriately presented data on the highest of the 98th percentile visibility improvements at each of the nine affected Class I areas for the three meteorological years from 2001 through 2003.[473]

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[472] 81 FR 2004, 2018 (Jan. 14, 2016).
[473] 81 FR 2004, 2035.

Response: We concur that, for the purpose of assessing BART, it was appropriate for the EPA to present the 98th percentile visibility improvement.

Comment: [Conserv Orgs, p. 21] EPA's visibility analysis correctly found that the selection of LNB with SOFA and SCR provided "substantial visibility benefits, both total and incremental" at each of the four Hunter and Huntington BART units.

Response: We concur. However, the visibility benefits must be viewed in consideration of all five BART factors. Refer to our discussion of the BART selection elsewhere.

Comment: [Conserv Orgs, p. 23-24] Finally, EPA's modeling results are also very similar to the visibility modeling analysis presented by the Conservation Organizations. And while these extraordinary visibility benefits alone justify selection of SCR as BART for the four Hunter and Huntington units, we also agree with EPA's conclusion that the visibility benefits justify the cost of SCR at these units.

Response: All five factors must be considered in selecting BART, and the visibility benefits should not be taken alone to justify selection of SCR as BART for the four Utah BART EGUs. Nonetheless, as discussed in other responses, we agree that the visibility benefits justify SCR at these units in light of the cost of compliance and the other factors.

Comment: [PacifiCorp, pp. 3, 32] Grossly flawed analysis of cost. [FIP Proposal] EPA's cost analysis is wrong for the numerous reasons, including the following: (1) it utterly fails to provide any rationale for the 70 million dollar difference between its cost estimate for SCR and PacifiCorp's cost estimate for SCR; (2) EPA failed to follow its own the Cost Control Manual – one that EPA has compulsively required utilities' to use – by disallowing material costs that are specifically included and allowed by the CCM. Finally, EPA's expert inexplicably and incorrectly redesigned the SCR technology – without any engineering support – to "show" that only one reactor is necessary instead of two and that less catalyst could be used, thereby further skewing the SCR cost analysis.

EPA's SCR cost estimates are flawed, particularly ATP's revisions to PacifiCorp's cost estimates and also because of EPA's departure from the existing CCM. EPA's NO_x BART determinations in its FIP Proposal are flawed because they relied on ATP's flawed SCR cost estimates.

To identify and explain these flaws, PacifiCorp retained Sargent & Lundy ("S&L"),[474] a respected engineering firm that engineers and designs NO_x pollution control devices, such as

[474] S&L's experience in the electric power industry, as well as its experience working with PacifiCorp, made it uniquely qualified to perform a review of ATP's and EPA's SCR cost estimates. S&L has considerable experience with the federal and state environmental regulations affecting power plant operations, as well as the specification,

SCRs. S&L generated a report ("S&L Report"), attached hereto as Attachment 5, which is hereby incorporated by reference. S&L identified several material mistakes made by ATP in generating its SCR cost estimates, which estimates EPA then relied on in its BART determinations and FIP Proposal. EPA also made its own independent mistakes in its SCR cost estimates.[475] As a result of ATP's and EPA's cost-estimating mistakes and misapplication of the applicable statutes and regulations, the EPA's BART cost estimates for SCR are vague, confusing, illegal, and wrong, and EPA's FIP Proposal should be rejected, for the following reasons.

Response: Refer to our responses elsewhere in this document that address each of the specific claims made by PacifiCorp in relation to EPA's analysis of the costs of compliance in support of our FIP. Most notably, in the revised cost estimates that support the final rule, we have allowed for the SCR design envisioned by PacifiCorp. We appreciate the commenter's recitation of Sargent & Lundy's qualifications; nonetheless it is the content of the report, not those qualifications, to which we respond.

Comment: [PacifiCorp, p. 33] EPA's SCR BART cost estimates are missing required information -- EPA claims that its SCR capital costs were obtained, in part, from PacifiCorp's 2014 BART Analyses. However, PacifiCorp's estimated SCR capital costs are much higher than EPA's estimated SCR capital costs. For example, in PacifiCorp's August 4, 2014 BART analysis, page 2, the estimated SCR capital costs for LNB/OFA/SCR are $180.8 million for Hunter Unit 1. S&L Report at 3, tbl. 1. EPA claims the estimated capital costs for LNB/OFA/SCR are $110.3 million for Hunter Unit 1. See 81 Fed. Reg. 2,004, 2,035 tbl 14. While EPA claims PacifiCorp improperly included certain costs (which claim is wrong), EPA never explains the $70 million difference between its SCR cost estimate and PacifiCorp's SCR cost estimate for Hunter Unit 1.[476] EPA must adequately support and document its BART cost analysis, which includes explaining the differences between PacifiCorp's August 2014 BART analysis costs and EPA's revised costs relied upon in the Proposed Rule. PacifiCorp cannot verify EPA's SCR cost estimates, which are reductions of PacifiCorp's SCR cost estimates, until EPA explains how it reduced PacifiCorp's cost estimates on an item by item basis. EPA's

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evaluation, selection, and implementation of emission control technologies for both gas- and coal fueled utility power facilities, including extensive experience with the NO_x control technologies evaluated. For example, since 2000, S&L has provided, or is currently providing, engineering services for the implementation of SCR systems on 68 units, totaling more than 36,000 MW of operating capacity. S&L's first-hand experience with NO_x control technologies, especially SCR systems, provides it with a thorough understanding of both the capital and operating and maintenance (O&M) costs associated with these technologies. In addition, S&L has completed multiple projects for PacifiCorp at both the Hunter and Huntington stations and is familiar with the site constraints and the potential challenges to construct SCR systems at each station.

[475] EPA made several obvious mistakes in its SCR cost estimates. For example, EPA's FIP Proposal rejects PacifiCorp's SCR cost estimates allegedly because they included improper items, such as AFUDC. See 81 2004, 2034-35. However, EPA's own expert stated "AFUDC is not included in the overnight cost methodology of the CCM an therefore was not allowed. PacifiCorp correctly excluded this from their estimate." ATP Report, page 10.

[476] Again, although PacifiCorp uses Hunter 1 as an example, EPA and ATP made the same SCR cost estimating mistakes at all of the Utah BART units. Therefore, all of the arguments made herein apply with equal force to all Utah BART Units.

"actions must be reasoned." Nat'l Parks Conservation Ass'n v. E.P.A., 788 F.3d 1134, 1141 (9th Cir. 2015). The law requires EPA to "cogently explain why it has exercised its discretion in a given manner." Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983); Gen. Chem. Corp. v. United States, 817 F.2d 844, 857 (D.C. Cir. 1987) (per curiam). Here, EPA has not cogently explained the difference between its SCR BART cost estimates and PacifiCorp's SCR cost estimates.

Response: We disagree with this comment. The 2015 report by ATP documented the reasons for EPA's cost adjustments to the cost estimates prepared by Sargent & Lundy for PacifiCorp. Also, the Microsoft Excel workbook UT_EGU_BART Costs_20151029.xls provided detailed, line-by-line explanation of any adjustments to the SCR capital costs developed by PacifiCorp in the worksheet SCR_PacifiCorp Annual_Adjusted. That worksheet shows PacifCorp's estimate and the adjusted amount. Each line where an adjustment is made to PacifiCorp's estimate is highlighted in yellow with the explanation in column L of the worksheet. Thus, commenter's allegations about the lack of basis for our cost estimates are simply incorrect.

In any event, EPA's most recent cost estimate shown in Microsoft Excel Workbooks UT_EGU BART Costs_2016_RTC_20 year.xls and UT_EGU BART Costs_2016_RTC_30 year.xls demonstrate that EPA has accepted more of the costs that were originally included in PacifiCorp's 2014 estimate. As described elsewhere in these responses to comments, the PacifiCorp costs that were previously adjusted and are now included as originally submitted include costs associated with the SCR reactor design and the induced draft fan. Also as described elsewhere in these responses to comments, in this more recent estimate EPA has allowed for the volume of catalyst originally estimated by PacifiCorp, although not the catalyst pricing originally submitted by PacifiCorp. EPA confirmed EPA's estimate of catalyst prices with recent catalyst pricing data.

Comment: [PacifiCorp, p. 34] EPA's cost estimates are contrary to the CCM -- In the FIP Proposal, EPA states that "cost estimates for control technologies should be based on the CCM, where possible." See 81 FR at 2033. But EPA, and its expert, ATP, ignored certain costs allowed by the EPA Control Cost Manual ("CCM") when calculating SCR costs for the NO_x BART determinations. For example, in the ATP Report, pages 7-8, EPA's expert discounted costs from PacifiCorp's SCR cost estimates that the same experts admit are allowed by the CCM. The ATP Report admits "PacifiCorp provided cost estimates that follow the general format of the 2002 CCM. Although the 2002 CCM shows a process contingency of 5% in Table 2.5 in Section 4.2 (page 2-44), this is not necessary today for SCR on coal-fired boilers firing the coals used in Utah." Id. In other words, ATP and EPA inappropriately disallowed SCR costs for process contingency that are explicitly authorized by the CCM. S&L estimates that improperly excluding the "process contingency" reduced EPA's SCR cost estimates by approximately $6 million per Utah BART Unit. S&L Report at 23, tbl 2. This cost is material and impacts the BART cost-effectiveness analyses.

But this is not all. ATP and EPA further skewed the SCR cost estimates relied on by EPA by disallowing general facilities costs, catalyst costs, and indirect installation costs -- all of which

are specifically allowed by the CCM. It is improper for EPA to ignore SCR costs allowed by the CCM. See 79 FR at 5032, 5135 ("There are only very limited situations in which a state or EPA can depart from the CCM cost methodology. . . . The guidelines for BART determinations make it clear that the CCM is the intended methodology for conducting a BART cost determination. It also states why: To maintain and improve consistency.").

If ever this rationale applied to a regional haze plan, it applies to the FIP Proposal. In an attempt to validate its SCR-focused BART determinations in the FIP Proposal for the Utah BART Units, EPA compared the Utah BART Units' cost and visibility data with that from SCR-focused BART determinations for the Cholla power plant in Arizona, Laramie River power plant in Wyoming, and Hayden power plant in Colorado. See e.g., 81 FR at 2037. However, as EPA has admitted, such comparisons are meaningless unless the cost estimates are done in a consistent manner. Therefore, before EPA can make the alleged BART cost comparisons, it will need to show it made the same CCM adjustments to the cost estimates for the Cholla, Laramie River, and Hayden cost estimates. This it cannot do, and EPA should withdraw its FIP Proposal.

a. "Draft" changes to the CCM Don't Count -- Additionally, ATP and EPA incorrectly made changes to PacifiCorp's SCR cost estimates based on draft changes to the CCM. See e.g., 81 FR at 2032 ("we have utilized portions of the draft 2015 revisions to the CCM chapters for the post-combustion NO_x control technologies," including SCR). For example, ATP rejected S&L's and PacifiCorp's catalyst cost estimates, derived from experience and application of the appropriate cost estimation methods, partially due to ATP's application of the draft 2015 CCM revisions. See e.g., ATP Report at 13 (ATP used the 2015 draft CCM to calculate catalyst costs). EPA's actions are improper. EPA cannot rely on draft CCM changes that are still subject to rulemaking and subject to revision to reduce PacifiCorp's SCR cost estimates. EPA claims it follows the CCM to ensure consistency between BART determinations. See 79 FR at 5032, 5135 ("The guidelines for BART determinations make it clear that the CCM is the intended methodology for conducting a BART cost determination. It also states why: To maintain and improve consistency."). Using the draft 2015 CCM proposed revisions for the NO_x BART determinations in the FIP Proposal when EPA knows those same revisions were not used for other BART determinations is highly inconsistent. Finally, given EPA's historic refusal to consider updated visibility modeling,[477] EPA's reliance on a draft revision to the CCM to formulate its SCR cost estimates for the BART NO_x determinations is arbitrary and capricious.

Response: EPA disagrees with these comments, and has addressed each one of these costs that were disallowed or modified individually. But, first it is important to address how the 2002 CCM determines cost. The cost estimating methods employed in the 2002 CCM are designed to be built up from an estimate of the Direct Capital Cost (DCC) for the selective catalytic reduction (SCR) process equipment. According to the 2002 CCM Section 4.2, Chapter 2, page 2-41, the DCC include:

[477] *See* 79 FR 5032, 5115 ("We did not use CALPUFF Version 6.4 because this version of the model has not been approved by EPA for regulatory use.").

> Direct capital costs (DCC) include purchased equipment costs (PEC) such as SCR system equipment, instrumentation, sales tax and freight. This includes costs associated with field measurements, numerical modeling and system design. It also includes direct installation costs such as auxiliary equipment (e.g., ductwork, fans, compressor), foundations and supports, handling and erection, electrical, piping, insulation, painting, and asbestos removal.

The 2002 CCM provides Equation 2.36 to estimate the DCC on page 2-42 of Section 4.2 Chapter 2 of the 2002 CCM, shown in Figure 2 and the inputs to Equation 2.36 of the CCM are heat input to the boiler, the estimated height of the SCR, the ammonia injection rate, the volume of catalyst, whether the SCR is on a new unit or not, and whether or not a bypass is installed.

Figure 2. Equation 2.36 used to determine direct capital costs for SCR in the 2002 CCM.

$$DC = Q_B\left[\frac{\$3{,}380}{\left(\frac{MMBtu}{hr}\right)} + f\left(h_{SCR}\right) + f\left(NH_3 rate\right) + f\left(new\right) + f\left(bypass\right)\right]\left(\frac{3500}{Q_B}\right)^{0.35} + f\left(Vol_{catalyst}\right)$$

The SCR reactor height and catalyst volume and ammonia mass flowrate are calculated using other equations in the 2002 CCM that are explored in other areas of these comments. And, these equations are all functions of performance characteristics of the SCR (gas flowrate, NO_x reduction, etc.).
From equation 2.36, indirect capital costs are determined by multiplying the direct capital costs by factors suggested in the 2002 CCM. The indirect capital costs include:

- Indirect installation costs – General Facilities, Engineering & Home Office Fees, and Process Contingency
- Project Contingency
- Preproduction costs
- Inventory Capital, and
- Initial catalyst and chemicals

So, it is important to note that the 2002 CCM methodology does not entail estimating quantities of materials, labor hours, or various details of the site or system, as was performed for PacifiCorp by Sargent & Lundy in determining the cost estimate. The methodology in the 2002 CCM calculates the cost solely based upon the general characteristics of the facility, such as boiler gas flowrate and performance aspects of the SCR. With that as background, it is possible to address PacifiCorp's comments regarding the specific indirect costs that EPA modified. Regarding the specific aspects of the PacifiCorp cost estimate that EPA accepted or adjusted, PacifiCorp provided comments on pages 32 through 36 of their comments that are specific to particular cost elements that will be addressed individually.

PacifiCorp further commented that Andover Technology Partners (ATP) and EPA incorrectly used draft changes to the CCM. As will be demonstrated in detailed responses to comments, the

methods in the 2015 draft CCM that were used by EPA for catalyst sizing, ammonia flowrate and other aspects of the cost estimate are identical to the methodology in the 2002 CCM. The new cost estimating methods in the 2015 draft CCM, particularly those based upon cost algorithms originally developed by Sargent & Lundy for the Integrated Planning Model, were not used by EPA in this determination.

Refer to our responses elsewhere in regard generally to comparisons of cost and visibility data with that from other BART determinations. With respect to the specific argument that EPA must demonstrate that cost estimates for the comparison BART determinations were performed in exactly the same way as here, we disagree.
The commenter confuses EPA's rationale for general consistency for cost estimates with the situation here. As explained by the Ninth Circuit Court of Appeals with respect to disallowance of AFUDC:

> Control options are likely to impact similar sources similarly; comparisons assure that the cost and benefit figures used for a particular site are realistic, rather than inflated in one direction or another. Consideration of AFUDC would not further this inquiry, as AFUDC is ultimately reflective of the implementing entity's financial and logistical situations, grounded in past decisions and in the company's financial policies and attitudes, not of the hard costs of the equipment and construction, which should be consistent across sites.

Ariz. ex rel. Darwin v. U.S. EPA, 815 F.3d 519, 541 (9th Cir. 2016). Our cost analyses are intended to estimate "the hard costs of equipment and construction" as accurately as is reasonably possible within a consistent methodology (i.e. the Guidelines and the CCM). This may mean accepting specific costs that are reasonably analyzed and documented even when they deviate from the CCM, which is allowed by the BART Guidelines. This methodology does not skew cost-effectiveness values in one direction or the other, unlike inclusion of AFUDC, which uniformly inflates them. The goal is to get as accurate values as possible within the Guidelines and CCM framework. That some BART determinations may have had more information to work with in making cost estimates, and others less, does not mean that the BART determinations are not usable as comparison points. In addition, given that all the BART determinations we used for comparison were either carried out by EPA or approved by EPA through a notice-and-comment rulemaking, during which commenters were free to object to inconsistencies in methodologies (and these actions did receive considerable comment) it is reasonable to assume no important inconsistencies were identified.

Furthermore, this rulemaking is carried out under section 307(d) of the Act. Under section 307(d)(7)(B), commenters must raise their objections with "reasonable specificity." This comment does not do so – it fails to identify any significant disparity in the cost methodology in the BART determinations we used for comparison purposes. This could be because the commenter was not able to do so, or did not try to do so, but no matter what the comment does not meet this burden. The commenter cannot shift this burden to EPA to perform some analysis

to show that the commenter's unsupported speculation is wrong.[478] Thus, we reject the suggestion that we were required to demonstrate that the cost methodology was performed in precisely the same way in each of the BART determinations we used for comparison as it was performed in this action.

Comment: [PacifiCorp, p. 35] EPA's SCR BART Cost Estimates are Invalid -- EPA admitted that it relied on the ATP Report for its SCR cost estimate information. See, e.g. 81 FR at 2035 (Hunter 1). However, the ATP Report was incorrect, and these mistakes carried over to EPA's BART cost analyses for the Utah BART Units.

a. The ATP Report's cost comparisons are incorrect -- As part of its Report, ATP considered "historical industry cost data . . . to determine if the costs were reasonable in the context of what has been reported at other facilities." ATP Report at 7. However, ATP's analysis was skewed because it relied upon comparisons with SCR units built at a much lower elevation (ignoring the increase in flue gas volume from higher elevation units, like Huntington and Hunter). See S&L Report, at 2-3. ATP also included cost data from the early 2000s, and then incorrectly escalated it using the CEPCI, which is an improper method. See S&L Report at 3-4. When the correct adjustments are made for elevation479 and outdated cost information, ATP's SCR cost estimates are demonstrably too low, and are not representative of costs actually incurred for recent SCR installations. See S&L Report at 4-5. However, PacifiCorp's SCR cost estimates, without ATP's and EPA's improper reductions, are representative of actual SCR costs. Id. at 5, fig. 1. In fact, PacifiCorp's SCR cost estimates, on a $/kw basis, are less than the 2013 SCR cost included in the ATP Report. Id. at 5. All of this information shows EPA's SCR cost estimates are unreasonable and flawed. Therefore, EPA's SCR cost estimates and related NO_x BART determinations are likewise flawed.

b. The ATP Report arbitrarily rejected "process contingency" -- ATP argues that, although the CCM allowed the "process contingency" identified in PacifiCorp's cost estimates, it is outdated because SCR is a "well proven and well understood technology on a wide range of US coals." ATP Report at 7-8. However, as S&L explains, the lack of experience with western bituminous coals, particularly Utah coals, and the potential for vapor-phase phosphorous poisoning of catalyst for deep-stage burners, such as those at the Utah BART Units, justify the process contingency provided for in the CCM. See S&L Report, at 6-7. Moreover, ATP and EPA are essentially modifying the CCM without putting the same through the required notice and comment process, which neither ATP nor EPA can do. ATP's and EPA's rejection of the "process contingency" in PacifiCorp's SCR cost estimates was inappropriate.

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[478] As a general matter an agency "cannot be expected to make silk purse responses to sow's ear arguments." *City of Vernon v. FERC*, 845 F.2d 1042, 1047 (D.C. Cir. 1988).

[479] ATP's and EPA's failure to properly consider the impact site elevation has on SCR costs is surprising given that both made this same mistake with SCR cost estimates in Wyoming, and corrected it only after prompting through public comments. See 79 FR 5032, 5039 ("EPA revised the cost analyses from those found in the proposed rule based upon input from various commenters. Some of factors that caused us to revise our cost estimates included accounting for site elevation in the SCR capital cost. . . .").

c. The ATP Report capriciously rejected "project contingency"-- The ATP Report also rejected PacifiCorp's "15% project contingency" as excessive, and stated "no additional project contingency is allowed." ATP Report at 8-9. ATP claims the project contingency should not be allowed because it results in double counting, and because PacifiCorp's SCR cost estimates were "detailed estimates" instead of "study-level (class 4 or 5) estimates." Id. at 9. ATP essentially admits that a 15% project contingency is proper for certain categories of estimates, but claims that PacifiCorp's SCR cost estimates do not fall within these categories. Id. at 8. ATP is wrong. ATP improperly classified PacifiCorp's SCR cost estimates as "detailed estimates" for which a project contingency is not allowed, ignoring that such "detailed estimates" require completion of at least 30% of the engineering and the SCR system design and construction must have been awarded to a contractor. See S&L Report at 7-9. The level of engineering work done for PacifiCorp's 2014 SCR cost estimates for Hunter and Huntington is below 5% and no SCR system design and construction contract has been awarded. Id. at 8. Therefore, according to the parameters identified in the CCM, PacifiCorp's SCR cost estimates are definitely "study level" estimates and the 15% "project contingency" should be included in EPA's SCR cost estimates. Id. at 9. Moreover, ATP's concerns about "double counting" are misplaced and ATP did not identify any items it claims were double counted. Id. S&L estimates ATP's "project contingency" mistake changed the EPA's SCR cost estimates by approximately $22 million per Utah BART Unit. S&L Report at 23, tbl 2. EPA's and ATP's cost-estimating mistakes regarding the "project contingency" are material, and invalidate EPA's FIP Proposal.

d. The ATP Report improperly refuses "general facilities costs" -- In its SCR cost estimates, ATP refused to include a line item for "general facilities" to "avoid double counting." ATP Report at 9. ATP's refusal is incorrect for two reasons. First, S&L and PacifiCorp "correctly followed the example illustrated in Chapter 2 of the Control Cost Manual with respect to General Facilities." See S&L Report at 10. Second, much of the equipment "listed in S&L's estimate to which Andover objects is safety related and included to protect the operating personnel. This equipment is required by the process and contributes directly to the physical capital costs." Id. ATP's example of "double counted" costs are unclear, and confusing. Id. S&L estimates ATP's "general facilities" mistake changed EPA's SCR cost estimates by approximately $6 million per Utah BART Unit. S&L Report at 23, tbl 2. EPA's and ATP's cost-estimating mistakes regarding the "general facilities cost" are material, and invalidate EPA's FIP Proposal.

e. ATP incorrectly disallowed "indirect installation costs" – ATP disallowed certain "indirect installation costs," again alleging that such costs were double counted. ATP Report at 11. ATP is wrong again. PacifiCorp's SCR cost estimates were already adjusted to avoid double counting and PacifiCorp followed the CCM when addressing indirect installation costs. See S&L Report at 12-14. Despite the fact that indirect installation costs are real world costs that PacifiCorp will incur if required to install SCR, PacifiCorp followed the CCM and excluded the required costs. Id. S&L estimates ATP's "indirect installation cost" mistakes changed the EPA's SLR cost estimates by approximately $5.7 million per Utah BART Unit. S&L Report at 23, tbl 2. EPA's and ATP's cost-estimating mistakes regarding the "indirect installation costs" are material, and invalidate EPA's FIP Proposal.

f. ATP, and EPA by extension, illegally redesigned the SCR and incorrectly underestimated catalyst costs. ATP illogically adjusted PacifiCorp's SCR cost estimates based on ATP's incorrect analyses of catalyst cost, catalyst volume and life span, SCR reactor design, and use of regenerated catalyst. ATP Report at 14-20. ATP's assumptions lack any proper engineering basis, and are completely incorrect. First, PacifiCorp's catalyst cost estimates were based on the CCM, and as such should be allowed. See S&L Report at 14. Moreover, ATP's claim that PacifiCorp adjusted catalyst costs by improperly using the CEPCI is wrong; ATP misinterprets how PacifiCorp calculated catalyst costs. Id. at 14-15. Additionally, ATP's catalyst cost number is an arbitrary number that omits real world costs, such as freight costs or labor to load the catalyst into the SCR reactors. Id. at 15. EPA cannot rely on such arbitrary numbers. PacifiCorp's catalyst cost numbers were based on S&L's experience with recent catalyst pricing received from industry vendors, which include freight costs and installation. Id. Moreover, PacifiCorp's catalyst costs are lower than those used in the examples in the CCM and in EPA's fact sheet, cited by ATP. Id. S&L's replacement catalyst costs were extremely conservative, and less than the CCM would allow. Id. Therefore, PacifiCorp's catalyst costs estimates are reasonable, and EPA's are not.

Regarding catalyst life and volume, ATP is again wrong. "The amount of SCR catalyst volume required depends on the following design parameters: 1) gas volume, 2) gas temperature, 3) Amount of NO_x removed, 4) catalyst life, 5) fuel properties (which dictate the deactivation rate), and 6) SO_2 to SO3 oxidation rate. The data included in Andover's report that they use to conclude S&L's catalyst volume is over-estimated contains only one of these variables (catalyst life)." See S&L Report at 16. Therefore, ATP's catalyst volume estimates are based on incorrect assumptions. Also, ATP's catalyst life data did not include units designed with 32,000 hours of life, which is the design life of Hunter and Huntington SCR reactors. Id. Instead, ATP relied on units designed for 16,000 hours of catalyst life. Id. Also, ATP incorrectly included "gross output (MW), which is not directly proportional to gas volume in the case of the Hunter and Huntington units, each of which are over 5,600 feet in elevation, and as previously discussed, have significantly higher gas volumes for equivalently rated units located at sea level. For this reason, gross output (MW) cannot be used to compare catalyst volumes for plants that vary in elevation." Id. Additionally, ATP incorrectly calculates catalyst volume and cost by using a NO_x % reduction number, when catalyst volume depends on the gross amount of NO_x removed, not the percentage of NO_x reduction. Id. ATP also mistakenly estimated that catalyst deactivation rate would be similar to Eastern Bituminous coal, instead of Western Bituminous coal (which is a more conservative assumption given the "unknowns" involved in using Utah coal). Id. at 17. ATP's mistakes have caused it to reject PacifiCorp's correct SCR cost estimates, including catalyst costs, and replace them with ATP's incorrect estimates. Moreover, PacifiCorp's catalyst volume and life estimates were based on the work done by S&L for PacifiCorp's Naughton Unit 3 SCR project in Wyoming, and represent practical, relevant and market-based cost estimation experience. ATP was wrong to ignore this data. Id.

Also, ATP erroneously claims one SCR reactor can be used instead of two, thereby saving significant costs. ATP Report at 16-18. ATP's error is based on its fundamental misunderstanding: SCR design is based on the volume of catalyst. ATP's assumption is

completely wrong. Rather, SCR reactor design is primarily based on gas flow and velocity. See S&L Report at 19. ATP's attempted redesign to one SCR reactor is technically infeasible, resulting in inadequate "residence time" to achieve the required NO_x reduction and causing the catalyst to erode in a very short time, rendering the SCR useless. Id. EPA cannot base its SCR cost estimates on an SCR system redesign that is technically infeasible, and would defeat the very purpose of the SCR system. Moreover, neither ATP nor EPA provides a supportable engineering basis for ATP's attempted redesigns of the SCR reactors.

Finally, ATP objects to PacifiCorp's SCR cost estimates by claiming that PacifiCorp should have used the costs for regenerated catalyst, instead of new catalyst. ATP Report at 11. S&L has participated "in several catalyst replacement projects in the last year and in each of these projects new catalyst was purchased for the spare or replacement layer. In addition, due to mechanical degradation of the modules, which cannot be recovered, the mechanical life of regenerated catalyst is much lower than new catalyst and has not been guaranteed to meet the duration which the catalyst is typically expected to remain within the reactor." S&L Report at 20. Therefore, ATP should not have rejected PacifiCorp's SCR cost estimates because it did not use regenerated catalyst.

S&L estimates ATP's SCR design mistake and catalyst cost underestimations changed EPA's SCR cost estimates by approximately $18.5 million per Utah BART Unit. S&L Report at 23, tbl 2. EPA's and ATP's cost-estimating mistakes regarding the SCR redesign and catalyst costs are material, and invalidate EPA's FIP Proposal.

g. ATP wrongly modified ID fan costs in the SCR cost estimates. ATP claims that PacifiCorp overestimated the costs of ID fans because a smaller fan could be used. ATP Report at 18-19. ATP estimated the cost of the replacement fan by using an algorithm, rather than obtaining a vendor cost estimate. Id. ATP's ID fan cost estimates are wrong because the new ID fans must handle the entire flue gas flow and be designed to overcome the additional pressure drop from the SCR and the original differential pressure it was designed for (e.g., air preheaters, ESPs, etc.). See S&L Report at 20-21. EPA cannot base its SCR cost estimates on undersized fans.

S&L estimates ATP's ID fan mistake cost underestimations changed EPA's SCR cost estimates by approximately $875,000 per Utah BART Unit.

h. ATP's and EPA's SCR cost estimation mistakes materially affected EPA's NO_x BART determinations. Each of the cost estimation mistakes discussed above in paragraphs a-g materially impacted EPA's NO_x BART cost estimates. For example, ATP's SCR cost estimate errors result in over $70 million in excluded capital costs at Hunter Unit 1. See S&L Report at 23, tbl. 2. ATP's mistakes also resulted in it miscalculating operation and maintenance expenses for the Utah BART Units. Id. As a result, EPA's NO_x BART determinations (which rely on ATP's incorrect SCR cost estimates) in its FIP Proposal are flawed and the FIP Proposal should be withdrawn. The cost estimation mistakes identified above in paragraphs a-g materially affect the overall cost of the proposed SCRs, and thereby would also materially affect the "average cost

effectiveness" and "incremental cost effectiveness" numbers used by EPA in its justifications for the NO_x BART determinations requiring installation for SCR.

Response: EPA disagrees with the commenter's characterization of EPA having made "mistakes". EPA has addressed specific issues in other areas of these responses to comments.

EPA's revised cost summary allows for the SCR system design developed by Sargent & Lundy that includes over 1000 cubic meters of catalyst and two 40 foot by 40 foot SCR reactors erected to the side of the boilers. For reasons discussed in other parts of this response to comments, EPA believes that this is a very conservative design that results in a conservatively high cost estimate. Nevertheless, even accepting that design EPA believes that SCR is still supported as BART. Tables 4a and 4b and Tables 5a and 5b show the estimated costs assuming a 20 year economic life. These cost estimates are from the Microsoft Excel workbook UT_EGA_BART Costs_RTC_2016_20 year.xls that is included in these responses to comments.

Table 4a. Hunter 1 estimated costs (20 year life)

	Comb Control (CC)	**SNCR**	**SCR**	**CC and SNCR**	**CC and SCR**
Capital Cost, $/kW	$26	$17	$267	$43	$293
Control Efficiency	48%	21%	76%	59%	88%
Uncontrolled Rate					
NO_x Rate (lb/hr)	1922	992	992	1922	1922
NO_x Rate (lb/MMBtu)	0.40	0.21	0.21	0.40	0.40
NO_x (TPY)	6284	3242	3242	6284	6284
Controlled Rate					
NO_x Rate (lb/hr)	992	780	240	779.81	239.95
NO_x Rate (lb/MMBtu)	0.21	0.16	0.05	0.16	0.05
NO_x (TPY)	3242	2549	784	2548.98	784.32
Tons/Year Removed	3042	693	2458	3735.01	5499.67
Total Cost/year	$1,161,898	$2,632,634	$13,670,265	$3,794,531	$14,832,163
$/Ton	$382	$3,796	$5,561	$1,016	$2,697
$/ton Incremental		$3,796	$6,255	$3,796	$6,255
		incremental versus CC	incremental versus SNCR	incremental versus CC	incremental versus CC and SNCR

Table 4b. Hunter 2 estimated costs (20 year life)

	Comb Control (CC)	**SNCR**	**SCR**	**CC and SNCR**	**CC and SCR**
Capital Cost, $/kW	$20	$18	$279	$38	$299
Control Efficiency	48%	21%	75%	59%	87%
Uncontrolled Rate					
NO_x Rate (lb/hr)	1,765	914	914	1,765	1,765

NO_x Rate (lb/MMBtu)	0.38	0.20	0.20	0.38	0.38
NO_x (TPY)	6,018	3,117	3,117	6,018	6,018
Controlled Rate					
NO_x Rate (lb/hr)	914	720	231	720	231
NO_x Rate (lb/MMBtu)	0.20	0.16	0.05	0.16	0.05
NO_x (TPY)	3,117	2,457	788	2,457	788
Tons/Year Removed	2,902	660	2,328	3,562	5,230
Total Cost/year	$864,040	$2,583,159	$13,645,778	$3,447,199	$14,509,819
$/Ton	$298	$3,913	$5,861	$968	$2,774
$/ton Incremental		$3,913	$6,632	$3,913	$6,632
		incremental versus CC	incremental versus SNCR	incremental versus CC	incremental versus CC and SNCR

Table 5a. Huntington 1 estimated costs (20 year life)					
	Comb Control (CC)	**SNCR**	**SCR**	**CC and SNCR**	**CC and SCR**
Capital Cost, $/kW	$18	$17	$261	$34	$278
Control Efficiency	42%	22%	77%	54%	87%
Uncontrolled Rate					
NO_x Rate (lb/hr)	1741	1018	1018	1741	1741
NO_x Rate	0.37	0.22	0.22	0.37	0.37
NO_x (TPY)	5876	3436	3436	5876	5876
Controlled Rate					
NO_x Rate (lb/hr)	1018	797	232	797	232
NO_x Rate	0.22	0.17	0.05	0.17	0.05
NO_x (TPY)	3436	2692	784	2,692	784
Tons/Year Removed	2440	745	2652	3,185	5,092
Total Cost/year	$810,754	$2,686,934	$13,808,205	$3,497,687	$14,618, 959
$/Ton	$332	$3,609	$5,206	$1,098	$2,871
$/ton Incremental		$3,609	$5,830	$3,609	$5,830
		incremental versus CC	incremental versus SNCR	incremental versus CC	incremental versus CC and SNCR

Table 5b. Huntington 2 estimated costs (20 year life)					
	Comb Control (CC)	**SNCR**	**SCR**	**CC and SNCR**	**CC and SCR**
Capital Cost, $/kW	$21	$17	$268	$38	$289
Control Efficiency	45%	22%	77%	57%	87%
Uncontrolled Rate					
NO_x Rate (lb/hr)	1,762	976	976	1,762	1,762
NO_x Rate	0.39	0.21	0.21	0.39	0.39

NO_x (TPY)	5,770	3,194	3,194	5,770	5,770
Controlled Rate					
NO_x Rate (lb/hr)	976	765	228	765	228
NO_x Rate	0.21	0.17	0.05	0.17	0.05
NO_x (TPY)	3,194	2,506	747	2,506	747
Tons/Year Removed	2,576	688	2,446	3,264	5,023
Total Cost/year	$941,438	$2,566,724	$13,764,311	$3,508,162	$14,705,749
$/Ton	$365	$3,730	$5,626	$1,075	$2,928
$/ton Incremental		$3,730	$6,368	$3,730	$6,368
		incremental versus CC	incremental versus SNCR	incremental versus CC	incremental versus CC and SNCR

Comment: [PacifiCorp, p. 39] EPA's cost comparison numbers are inconsistent and do not support EPA's "cost effectiveness" finding. As part of an analysis of the "cost" BART factor, a state or EPA needs to determine the "average cost effectiveness" and "incremental cost effectiveness" of the proposed BART control, and then determine if such costs are appropriate given the "reasonable anticipated" visibility improvement. See, e.g., 81 FR at 2037 (Hunter 1). In the FIP Proposal, EPA considered "the costs of compliance and visibility impacts by generally comparing them with BART determinations that have been made elsewhere." Id. For example, EPA compared the average and incremental cost effectiveness of SCR at Hunter Unit 1 to average and incremental cost effectiveness numbers for SCR at other, purposefully-selected units: Laramie River Station (Wyoming); Dave Johnston Units 3 and 4 (Wyoming); Hayden Units 1 and 2 (Colorado); and Cholla Units 2, 3, and 4 (Arizona).

Using these four facilities, EPA attempts to create a false standard, acting as if the BART determinations for these facilities are reflective of general cost effectiveness and visibility improvement standards everywhere. This simply isn't true for several reasons.

First, EPA ignores its own "cost effectiveness" standards used to create the presumptive BART limits, which EPA still uses when setting BART benchmarks for Better than BART analyses. For example, Appendix Y suggests that BART NO_x control costs above $1,500 per ton are not "cost effective." In the Preamble to the Regional Haze Rules, EPA suggested that 75% of the EGUs would have BART NO_x removal costs between $100 and $1,000 per ton, and almost all of the remaining EGUs could install sufficient BART NO_x control technology for less than $1,500 per ton.[480] EPA also recognized in the Preamble that SCR was generally not cost effective for EGUs,

[480] "The limits provided were chosen at levels that approximately 75 percent of the units could achieve with current combustion control technology. The costs of such controls in most cases range from just over $100 to $1000 per ton. Based on our analysis, however, we concluded that approximately 25 percent of the units could not meet these limits with current combustion control technology. However, our analysis indicates that all but a very few of these units could meet the presumptive limits using advanced combustion controls such as rotating opposed fire air ("ROFA"),

except for EGUs with cyclone boilers (where the cost per ton was less than $1,500 per ton, with an average of $900 per ton).[481] Based upon EPA's Preamble, BART NO_x control technology that costs more than $1,500 per ton should not be considered "cost effective." Here, EPA found BART NO_x controls with a "cost effectiveness" number several times $1,500 per ton to be "cost effective." EPA simply ignores its previous statements when attempting to establish its newly-minted cost-effectiveness threshold.

Second, EPA pointed only to BART determinations that support its position. EPA has ruled that NO_x BART controls, including SCR, with similar "cost effectiveness" numbers as it found for the Utah BART Units were not justified. For example, EPA approved Florida's BART determination that installing SCR was not "cost effective" when it would cost $3,776/ton of NO_x removed. See 77 FR at 73369-01, 73377. Additionally, in Montana, EPA found that where SNCR+SOFA had an average "cost effectiveness" of $3,195/ton and $3,235/ton, the incremental "cost effectiveness" of SCR+SOFA of $5,770/ton and $5,887/ton "is not justified." See 77 FR at 57864-01, 57889. Also, in Nebraska, EPA proposed to agree with Nebraska's decision to reject SCR at an average cost effectiveness of $2,297/ton and an incremental cost effectiveness of $5,445/ton (as calculated by Nebraska). See 77 FR at 12770, 12779. If EPA had selected these comparisons, or others,[482] it would reject SCR as NO_x BART at the Utah BART Units. EPA cannot "cherry-pick" favorable comparisons while ignoring unfavorable comparisons in its attempt to create the illusion of legitimacy for its NO_x BART determinations in the FIP Proposal.[483]

EPA attempts to use its "cherry picked" SCR BART determinations as a "metric" that a reader could use to understand how EPA determined BART. Nat'l Parks Conservation Ass'n, 788 F.3d at 1143. But EPA's previous SCR BART determinations and statements cannot serve as a reliable metric: they are too inconsistent. Id. at 1141 (stating that "inconsistent analysis is arbitrary and capricious"). A reader who reviewed all of EPA's prior NO_x BART determinations would be left entirely unable to predict at what price point EPA will determine that a control

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which has already been demonstrated on a variety of coal-fired units. Based on the data before us, the costs of such controls in most cases are less than $1500 per ton." See 70 FR at 39135.

[481] "We also analyzed the installation of SCRs at BART-eligible EGUs, applying SCR to each unit and fuel type. The cost-effectiveness was generally higher than for current combustion control technology except for one unit type, cyclone units. Because of the relatively high NO[x] emission rates of cyclone units, SCR is more cost-effective. Our analysis indicated that the cost-effectiveness of applying SCR on coal-fired cyclone units is typically less than 1500 a ton, and that the average cost-effectiveness is $900 per ton. As a result, we are establishing a presumptive NO[x] limit for cyclone units based on the use of SCR. For other units, we are not establishing presumptive limits based on the installation of SCR. Although States may in specific cases find that the use of SCR is appropriate, we have not determined that SCR is generally cost-effective for BART across unit types." 70 FR 39135-36.

[482] EPA previously approved Colorado's RH SIP in which Colorado determined that SCR is not cost effective when it "exceed[s] a cost of $5,000 per ton." 77 FR 18052-01, 18061. Though EPA noted some concerns it had with Colorado's reasoning, it ultimately approved its determinations, implicitly approving Colorado's determination that SCR is not cost effective when it exceeds $5,000/ton. Id.

[483] Moreover, comparisons with SCR BART determinations for Cholla and Laramie River are suspect for another reason. In both cases, EPA's SCR BART determinations have been challenged in court and are subject to judicial review. EPA cannot rely on SCR BART determinations that have judicially challenged and have not yet been upheld by a court.

technology is not cost effective, or what amount of modeled visibility improvement will trigger a certain technology, or what combination of cost and visibility numbers would result in the installation of SCR as BART. This stems not only from EPA's inconsistent determinations, but from EPA's stated unwillingness to provide a bright-line test for determining when a control technology is "cost effective." See 77 FR at 57864-01 ("While the Regional Haze Rule may allow us to establish a bright line for some of the factors such as cost-effectiveness and visibility, we are not required to do so, and have not done so for this action."). Further, EPA's BART determinations rely on its previous determinations in an entirely arbitrary and capricious manner, skewing the results by selecting favorable SCR BART comparisons and ignoring unfavorable ones. A metric which conforms to the whims of EPA's current desires is no metric at all. Therefore, EPA should withdraw its FIP Proposal.

Third, EPA's attempted cost and visibility data comparisons between the Utah BART Units, on the one hand, and Cholla, Hayden, and Laramie River, on the other hand, would only work if the SCR cost estimates, visibility analyses, and baseline emissions tests, among other things, were conducted in a similar manner. See e.g., 79 FR at 5032, 5156 ("A proper evaluation of cost-effectiveness allows for a reasoned comparison not only of different control options for a given facility, but also of the relative costs of controls for similar facilities. If the cost-effectiveness of a control technology for a particular facility is outside the range for other similar facilities, the control technology may be rejected as not cost-effective. In order for this type of comparison to be meaningful, the cost estimates for these facilities must be performed in a consistent manner. Without an "apples-to-apples" comparison of costs, it is impossible to draw rational conclusions about the reasonableness of the costs of compliance for particular control options.") (emphasis added) However, that is not the case. As explained above, the baseline emissions for Cholla and Hayden were calculated based upon the emissions reductions from relatively recently installed NO_x emissions control equipment; here EPA refuses to calculate baseline emissions based upon emissions reductions from relatively recently installed NO_x emissions control equipment at the Utah BART Units. EPA also conducted its CALPUFF visibility modeling differently for the Cholla, Hayden, and Laramie River BART determinations, which could materially impact the outcomes.[484] Also, ATP and EPA refused to consider certain CMM allowed costs and its expert "redesigned" the SCR reactors for Hunter and Huntington. EPA did not take the same SCR cost-estimating approach at Cholla, Hayden, or Laramie River.[485] As a result, EPA cannot compare costs between the Utah BART Units and EPA's "cherry-picked" units because EPA used

[484] Given the unique manner in which EPA conducted the CALPUFF visibility modeling for the FIP Proposal, it is highly unlikely that EPA conducted the CALPUFF modeling for SCR at Hayden, Laramie River, or Cholla in this same fashion. If the CALPUFF modeling for Hayden, Cholla, and Laramie River were not completed in the same manner as Hunter and Huntington, using the same background concentrations for ammonia, relative humidity, and other key inputs, as well as the way manner in which the model included other sources, then EPA is unable to make meaningful comparisons between the CALPUFF modeling results. In its FIP Proposal, EPA makes no attempt to explain whether or not the CALPUFF modeling runs were conducted in a similar fashion for the Cholla, Hayden, and Laramie River plants on the one hand and the Utah BART Units on the other hand.

[485] Other material differences exist between the cost estimates EPA attempts to compare. For example, EPA, after prompting from Laramie River's owner, considered the impact site elevation has on SCR cost. 79 FR 5032, 5180. EPA has not properly considered the impact site elevation has on SCR costs at the Utah BART Units.

different and inconsistent methods to calculate SCR costs and visibility improvement, making comparisons superficial and unpersuasive.

Response: We disagree. A partial response to this comment is provided in the FRN. We discuss there why the Florida, Nebraska, and Montana examples are not useful comparisons. We also note that we invited comment on our methodology and on the specific BART determinations we used for comparison. This gave commenters an opportunity to show that our selected BART determinations were not representative (or in commenter's words, that they were "cherry-picked"). The commenter has offered no further examples for comparison. We note that conservation groups offered some other BART determinations as potential comparisons, some of which we think support our determination (Apache, Coronado, and to some extent Four Corners) and some of which we think are not useful comparisons. Please see the details elsewhere in this RTC.

We considered all relevant BART determinations in making our final determination for Hunter and Huntington. However, as explained in the FRN and elsewhere in this RTC document, the facts underlying some of these determinations were so distinguishable from Hunter and Huntington that these other determinations do not provide much useful information about whether EPA should select SCR in this instance. If EPA or a state rejected SCR in a BART determination, but the costs were much higher and/or the visibility benefits were much lower than they are for Hunter and Huntington, then that other BART determination does not inform EPA's decision regarding whether we should select SCR for Hunter and Huntington. Similarly, if EPA or a state selected SCR in a BART determination, but the costs were much lower and/or the visibility benefits much higher than they are for Hunter and Huntington, then that other BART determination does not give much useful information about whether EPA should select SCR for Hunter and Huntington. At most, it could be said that either selecting or rejecting SCR at Hunter and Huntington would not be inconsistent with those other determinations.

We disagree that a member of the public who reviewed prior NO_x BART determinations would be unable to predict our NO_x BART determination here, given the consistency of our determination here with other determinations with similar values. While the member of the public might not be able to derive a universal bright-line rule from the set of NO_x BART determinations, it is not necessary to do so in order to see that this determination is in line with previous determinations. It is also not clear how to derive a bright-line rule, given that BART determinations are highly fact-dependent undertakings. Determining BART requires consideration of five factors, two of which, cost of compliance and anticipated visibility improvement, have several metrics. By this, we mean cost of compliance includes both average and incremental cost-effectiveness as metrics, while visibility improvement includes not only improvement in deciviews, but also improvement in number of days over 0.5 dv and over 1.0 dv as metrics. Furthermore, the visibility metrics should be considered at all impacted Class I areas. Given this, creating a single bright-line for when a control is cost-effective would be contrary to the requirement that all the BART factors be considered. If the visibility benefits are great, then a higher value for cost-effectiveness might still be reasonable, while if the visibility benefits are small, then a lower value for cost-effectiveness might be reasonable.

We disagree that the cost-effectiveness values for presumptive BART control our analysis here. First, for each source subject to BART, the RHR, at 40 CFR 51.308(e)(1)(ii)(A), requires that states (in this case, EPA in a FIP) identify the level of control representing BART after considering the factors set out in CAA section 169A(g), as follows: ''States must identify the best system of continuous emission control technology for each source subject to BART taking into account the technology available, the costs of compliance, the energy and non-air quality environmental impacts of compliance, any pollution control equipment in use at the source, the remaining useful life of the source, and the degree of visibility improvement that may be expected from available control technology.'' 70 FR 39158. In other words, the presumptive BART limits do not obviate the need to identify the best system of continuous emission control technology on a case-by-case basis considering the five factors. A state (or EPA in a FIP) may not simply determine that a control is not cost-effective merely because it is more expensive than the presumptive level of control if more stringent control technologies or limits are technically feasible. As explained above in discussing bright-line tests, such an approach would violate the requirement to consider all five factors. We do not read the BART guidelines in appendix Y to contradict the requirement in our regulations to determine ''the degree of reduction achievable through the application of the best system of continuous emission reduction'' ''on a case-by-case basis,'' considering the five factors. 40 CFR 51.301 (definition of Best Available Retrofit Technology); 40 CFR 51.308(e).

Also, our position is supported by the following language in our BART guidelines: ''While these levels may represent current control capabilities, we expect that scrubber technology will continue to improve and control costs continue to decline. You should be sure to consider the level of control that is currently best achievable at the time that you are conducting your BART analysis.'' 70 FR 39171.

We respond to the comment about consistency in cost estimates elsewhere in this RTC.

With respect to the comment about consistency in visibility modeling, EPA has consistently used CALPUFF 5.8 not only because it is the regulatorily approved model, but because doing so helps ensure consistency across BART determinations. However, in applying CALPUFF 5.8 to a particular source, EPA must choose parameters that try to accurately represent the situation for that source, such as the ammonia background. In some cases, EPA has monitoring data that support the use of a particular ammonia background; in other case EPA must rely on the default values recommended in the IWAQM guidance. In each case, though, EPA is attempting to get the most accurate result from CALPUFF 5.8. This does not skew the results in any particular direction, it simply improves the results. Thus, commenter's argument that CALPUFF 5.8 must be applied precisely the same way in each instance to make a reasoned comparison misses the mark. In addition, when a state chooses a somewhat different methodology in their submittal, EPA does not automatically disapprove the submittal on that basis; instead we typically try to analyze if the state's BART determinations still meet CAA requirements. In addition, given that all the BART determinations we used for comparison were either carried out by EPA or approved by EPA through a notice-and-comment rulemaking, during which commenters were

free to object to inconsistencies in methodologies (and these actions did receive considerable comment) it is reasonable to assume no important inconsistencies were identified.

Furthermore, this rulemaking is carried out under section 307(d) of the Act. Under section 307(d)(7)(B), commenters must raise their objections with "reasonable specificity." This comment does not do so – it fails to identify any significant disparity in the visibility modeling methodology in the BART determinations we used for comparison purposes. This could be because the commenter was not able to do so, or did not try to do so, but no matter what the comment does not meet this burden. The commenter cannot shift this burden to EPA to perform some analysis to show that the commenter's unsupported speculation is wrong.[486] Thus, we reject the suggestion that we were required to demonstrate that the visibility modeling was performed in precisely the same way in each of the BART determinations we used for comparison as it was performed in this action.

As explained elsewhere, we disagree with the commenter's argument that we have not properly considered site elevation in determining the costs of SCR.

Comment: [NPS, p. 2] We agree with EPA and UDAQ that BART for NO_x emissions at Hunter Units 1 and 2 and Huntington Units 1and 2 is SCR. We agree with EPA's demonstration that costs for SCR at these units are comparable to SCR costs for BART determinations in Arizona, Colorado, and Wyoming. Requiring SCRs for BART would be consistent with other EPA decisions in Regions 8 and 9.

Response: Comment noted.

Comment: [Conserv Orgs, p. 19] SCR Would Achieve Significant Emissions Reductions at a Reasonable Cost SCR is extremely cost effective for Utah's BART units. EPA projected costs of SCR ranging from $2,380 to $2,563/ton of NO_x removed.[487] The Conservation Organizations' estimates are similar.[488] Specifically, the cost effectiveness of SCR on Hunter Units 1 and 2 and Huntington Units 1 and 2 is in the range of $2,222-2,276/ton of NO_x removed.[489]

Response: Comment noted.

Comment: [Conserv Orgs, p. 19] The cost effectiveness for SCR on these units is much less than at other coal units in the west where EPA has required SCR as BART.

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[486] As a general matter an agency "cannot be expected to make silk purse responses to sow's ear arguments." *City of Vernon v. FERC*, 845 F.2d 1042, 1047 (D.C. Cir. 1988).
[487] *See* 81 FR 2035, 2039, 2042, 2046.
[488] *See* 2016 Stamper TSD, at 28 (separately filed on www.regulations.gov). On December 22, 2014, the Conservation Organizations submitted a detailed comment letter and expert reports to the State of Utah establishing that SCR is BART for NO_x emissions at Utah's BART sources— Hunter Units 1 and 2 and Huntington Units 1 and 2. Exhibits 2 and 13 hereto. Utah never responded to these comments.
[489] *Id.*

Response: We have compared the average and incremental cost-effectiveness of, as well as the visibility improvements from, SCR + LNB/SOFA with other BART determinations for coal-fired power plants. We have concluded that BART for the Hunter and Huntington BART units is SCR + LNB/SOFA.

e. Consideration of the Five Factors

Comment: [UDAQ, p. 18] EPA's FIP fails to analyze properly the five statutory BART factors. Specifically, EPA failed to properly consider and analyze the following aspects of the BART analysis: (1) existing pollution control technology in use at the Utah BART units; and (2) the reasonably anticipated degree of visibility improvement. Consequently, EPA's analysis is flawed[490] and cannot be sustained as a substitute for approving Utah's RH SIP proposal in its entirety.

Response: We respond to each of these claims individually in separate responses to comments.

Comment: [PacifiCorp, pp. 3, 43] *Improper accounting of Energy and Non-Air Quality Impacts.* [FIP Proposal] EPA did not identify or quantify the solid, liquid, and gaseous discharges from the SCR control devices under review, or the discharges with potential for causing adverse environmental effects. Also, EPA should have considered multiple energy impacts of installing SCR, but it did not. These impacts are supposed to carry greater weight in situations like the one at hand, where the visibility improvement of a particular option is marginal at best.

EPA's FIP Proposal is defective because EPA failed to properly evaluate the "energy" and "non-air quality environmental" factors for the Utah BART Units. Utah's previous BART determinations found these impacts weighed against SCR as NO_x BART; but, without explanation or conducting its own analyses, EPA found these impacts did not prohibit the selection of SCR. This EPA cannot do.

1. *The BART Guidelines require this factor be considered.* The BART Guidelines provide the methods EPA must employ when considering the energy and non-air quality environmental impacts of NO_x control options in a BART determination. See 70 FR at 39104-01, 39169. Among other considerations, the BART Guidelines provide that EPA "should identify any significant or unusual environmental impacts associated with a control alternative that have the potential to affect the selection or elimination of a control alternative." Id. The Guidelines elaborate that "these types of environmental concerns become important when sensitive site specific receptors exist *or when the incremental emissions reductions potential of the more stringent control is only marginally greater than the next most-effective option*." Id. Given that

[490] EPA also claims that its "evaluation of BART for Hunter and Huntington follows the Guidelines for BART Determinations Under the Regional Haze Rule." 81 FR 2032. However, EPA's failure to consider properly the five statutory BART factors means that any attempt to follow the BART guidelines is also flawed.

EPA's FIP Proposal is based on a miniscule, modeled 0.14 dv visibility improvement over the SIP Proposal, based on the 98th percentile test, this provision of the Guidelines is particularly applicable and non-air quality environmental impacts and energy impacts must be closely reviewed as part of EPA's NO_x BART determinations for the Utah BART Units. EPA failed to do so here.

2. *EPA did not properly analyze non air quality environmental impacts.* Here, EPA arbitrarily and capriciously failed to adequately address the non-air quality environmental impacts of SCR. See, e.g. 81 FR at 2004, 2035 (Hunter 1).[491] Though EPA admitted that SCR decreases the thermo efficiency (affecting energy use and greenhouse gas emissions) and increases "the quantity of ash that will need to be disposed," EPA conducted almost no analysis. Id. at 2035. EPA did not identify or quantify the "solid, liquid, and gaseous discharges from the control device or devices under review," as required by the Guidelines. See 70 FR at 39104-01, 39169. EPA did not analyze "discharges with potential for causing adverse environmental effects." Id. Nor did EPA "assess the mass and composition of any such discharges and quantify them to the extent possible based on readily available information." Id. Rather, after conducting almost no analysis, EPA concludes that "non-air quality environmental impacts [are] insufficient to eliminate or weigh against any of the BART options." See 81 FR at 2004-01, 2035. This conclusion, lacking sufficient supporting analysis, violates EPA's own rules. By failing to provide any applicable metric, failing to explain why it has exercised its discretion in this manner, and failing to follow the BART Guidelines, EPA's proposed RH FIP is arbitrary and capricious and should be withdrawn. Nat'l Parks Conservation Ass'n, 788 F.3d at 1141.

Moreover, EPA's SCR cost estimates are based upon a complete redesign of the SCR system, and are materially different from that contemplated by PacifiCorp's and Utah's SCR BART analyses. See ATP Report at 11-18. Therefore, EPA cannot rely on PacifiCorp's and Utah's previous SCR BART analyses to determine the non-air quality environmental and energy impacts for EPA's SCR BART determinations. New analyses of this statutory BART factor, in accordance with the BART Guidelines, must be undertaken by EPA to address the proposed SCR reactor design that it proposes.

3. *EPA did not properly consider SCR's energy impacts.* In its FIP Proposal, EPA should have considered three types of energy impacts. These include the energy associated with operating the controls, the energy that must be provided when the unit is removed from service in order to install the controls, and most importantly to the state of Utah and its citizens, the energy that must be replaced when the emissions controls prescribed for a given unit are not economically justifiable and result in accelerated unit retirements and replacements.[492]

The latter energy impact is of particular concern because the EPA has now proposed SCR controls for the Utah BART Units. Unlike the SIP Proposal, the EPA's FIP Proposal requires controls that may not be justifiable and could result in accelerated unit retirements and

[491] While PacifiCorp uses Hunter 1 as an example of EPA's failure to consider the energy and non-air quality environmental impacts, these arguments apply to EPA's NO_x BART determinations for all the Utah BART Units.
[492] 40 CFR 50 Appendix Y D.IV.h.5

replacements, potential natural gas conversions, and the associated costs and socio-economic impacts of removing major coal-fueled generation resources from service in areas of Utah that rely heavily on these facilities. If EPA intends to finalize its FIP Proposal that potentially could force the retirement, replacement, or natural gas conversion of the Utah BART Units, its five-factor analysis must include a thorough analysis of the system-wide energy impacts these individual unit compliance requirements will have on the states within which PacifiCorp serves customers. When considering the FIP Proposal, EPA must include in its evaluation of energy impacts and their associated costs the impacts to local jobs and state and local economies surrounding the affected facilities.

With retirement, replacement, or natural gas conversion of individual units a potential outcome due to EPA's FIP Proposal, EPA's assessment must include coordination with state regulators, environmental agencies and elected officials. As a regulated utility, PacifiCorp regularly engages with state regulators and elected officials to ensure that its resource planning and ultimate compliance approaches align with the interests of customers in the states it serves. These same state bodies and elected officials must be consulted by EPA to ensure that EPA's FIP Proposal is properly assessed in light of the issues described above.

As Powder River Basin Resource Council pointed out in its post-hearing brief filed in April 2013 before the Wyoming Public Service Commission in PacifiCorp's application filing to obtain approval for a Certificate of Public Convenience and Necessity to Construct Selective Catalytic Reduction systems on Jim Bridger Units 3 and 4, "it is evident that considering the cost and risk of these major environmental control projects up front, prior to installation, is a benefit to parties, ratepayers, and the public interest. These projects are significant undertakings – in some cases they are close to the financial equivalent of building new generation sources – and therefore they deserve a high level of scrutiny to ensure that the public's interests, and especially the specific financial interests of PacifiCorp ratepayers, are protected."[493] EPA is expected to obtain the same level of coordinated review.

Response: Because the regulatory requirements differ, the question of whether EPA properly accounted for energy and non-air quality impacts must be split into two parts: (1) whether we properly accounted for these impacts when evaluating the State's SIP BART Alternative under §51.308(e)(2) of the RHR, which pertains to alternative measures to BART, and (2) whether we properly accounted for these impacts when evaluating BART for the FIP under §51.308(e)(1) of the RHR, which pertains to BART itself. Here we address the second part of the question, while the first part is discussed in the *Legal Analysis* section above.
We disagree that we did not properly analyze non-air quality environmental impacts in the BART analyses supporting the FIP proposal. We explicitly addressed the non-air quality

[493] See Powder River Basin Resource Council's Post-Hearing Brief in Wyoming Public Service Commission Docket No. 20000-418-EA-12 (RECORD NO. 13314) at: http://edocs.puc.state.or.us/AD9EAE92-D6A8-4C0E-81D1-DB442CFB2244/FinalDownload/DownloadId-DCE8BAB12B5061CB4017455D76704E32/AD9EAE92-D6A8-4C0E-81D1-DB442CFB2244/efdocs/HBC/ue246hbc75023.pdf.

environmental impact, as well as the energy impacts, for the four BART EGUs. For example, consider EPA's discussion of these impacts for Hunter Unit 1 in our proposed rule:[494]

> Parts 2 and 3—Energy and Non-Air Quality Environmental Impacts of Compliance
>
> SNCR slightly reduces the thermal efficiency of a boiler as the reduction reaction uses thermal energy from the boiler, decreasing the energy available for power generation. Using the CCM, we have calculated the electrical power consumption of SNCR to be 326,000 kW-hr per year for Hunter Unit 1.
>
> For SCR, the thermal efficiency is much more reduced because the new ductwork and the reactor's catalyst layers decrease the flue gas pressure. As a result, additional fan power is necessary to maintain the flue gas flow rate through the ductwork and reactor. Using the CCM, we have calculated the electrical power consumption of SCR to be approximately 18,541,000 kW-hr per year for Hunter Unit 1. Both SCR and SNCR also require some minimal electricity to service pretreatment and injection equipment, pumps, compressors, and control systems. The energy requirements described earlier are not significant enough to warrant elimination of either SNCR or SCR as BART. In addition, the cost of the additional energy requirements has been included in our cost effectiveness calculations.
>
> SNCR and SCR will slightly increase the quantity of ash that will need to be disposed. In addition, transportation and storage of chemical reagents may result in spills or releases. However, these non-air quality environmental impacts do not warrant elimination of either SNCR or SCR as BART.
>
> There are no additional energy requirements associated with the new LNB and SOFA, and no significant non-air quality environmental impacts.
>
> In summary, we propose to determine that we have adequately considered these impacts by including cost of additional energy in cost effectiveness and assessing non-air quality environmental impacts as insufficient to eliminate or weigh against any of the BART options.

While the commenter is not satisfied with the level of detail of our analysis of the non-air quality environmental impacts, it has not substantiated that the BART Guidelines require any greater level of analysis. Even more importantly, the commenter does not provide any information or evidence to contradict EPA's conclusion that the non-air environmental impacts are not significant. The commenter has not identified any "solid, liquid, and gaseous discharges from the control device or devices under review" beyond those identified by EPA. Nor has the commenter quantified or characterized the waste streams that EPA does identify, such as an increase in ash disposal. Accordingly, the EPA continues to find that the non-air quality are not significant, and that they do not preclude the selection of any of the control options when considered along with the other statutory BART factors.

In addition, we note that the commenter's argument that the non-air quality environmental impacts are of particular importance when considering "miniscule" differences in modeled

[494] 81 FR 2035.

visibility impacts is misplaced in the context of our evaluation of BART under the FIP. The commenter focuses on the difference between the BART alternative and the BART benchmark (0.14 dv for the 98th percentile on average across 9 Class I areas). However, this is not a relevant consideration in the context of a BART determination. Rather, the language from the BART Guidelines cited by the commenter pertains to the difference in modeled visibility impacts (and thereby improvement) between competing BART control options – in this case LNB/SOFA, LNB/SOFA and SNCR, and LNB/SOFA and SCR. That is, for the purpose of selecting BART under §51.308(e)(1), it is not the difference in visibility impacts or benefits between the BART Alternative and the BART benchmark that is relevant, but rather the difference between the feasible control options identified in the BART analysis. These differences in modeled visibility were included in EPA's assessment of BART under the FIP option (and remained unchanged in our final rule). For example, consider Table 15 from the proposed rule:[495]

TABLE 15—HUNTER UNIT 1—VISIBILITY IMPROVEMENTS

Class I area	LNB with SOFA (Δdv)	LNB with SOFA and SNCR (Δdv)	LNB with SOFA and SCR (Δdv)
Arches NP	0.737	0.906	1.342
Black Canyon of the Gunnison NP	0.198	0.241	0.345
Bryce Canyon NP	0.306	0.372	0.534
Canyonlands NP	0.846	1.041	1.545
Capitol Reef NP	0.639	0.750	1.113
Flat Tops WA	0.231	0.280	0.404
Grand Canyon NP	0.349	0.426	0.618
Mesa Verde NP	0.235	0.286	0.426
Zion NP	0.184	0.224	0.323

The visibility results shown in Table 15, provided for each Class I area, demonstrate that the visibility differences between control options are not "miniscule" such that the non-air quality environmental impacts would take on particular importance. For example, the difference in the modeled visibility improvement between LNB/SOFA/SCR, EPA's BART selection under the FIP, and LNB/SOFA, the commenter's preferred BART selection, is 0.699 dv (1.545dv-0.846dv) at Canyonlands NP.

Even still, the commenter fails to provide all of the relevant text from the BART Guidelines (emphasis added):[496]

> Generally, these types of environmental concerns become important when sensitive site-specific receptors exist or when the incremental emissions reductions potential of the more stringent control is only marginally greater than the next most-effective option. *However, the fact that a control device creates liquid and solid waste that must be disposed of does not necessarily argue against selection of that technology as BART, particularly if the control device has been applied to similar facilities elsewhere and the solid or liquid waste is similar to those other applications.* On the other hand, where you or the source owner can show that unusual circumstances at the proposed facility create

[495] 81 FR 2035.
[496] 70 FR 39169.

> greater problems than experienced elsewhere, this may provide a basis for the elimination of that control alternative as BART.

The EPA has no reason to believe, and the commenter has not asserted, that the waste streams from any of the BART controls options, and SCR in particular, would be meaningfully different from where they have been installed at numerous other coal-fired EGUs like those under consideration in Utah. As such, we find no reason to argue against selection of SCR on that basis.

We also disagree that we did not properly analyze energy impacts in the BART analyses supporting the FIP proposal. The commenter asserts that we must assess three separate types of energy impacts. The first two types, energy associated with operating the controls, and the loss of generation when the unit is removed from service during the installation of controls, are direct energy impacts because they relate to energy impacts at the BART source. The third type, the energy that must be replaced if the source where to elect to retire a unit early as opposed to installing controls, is a "system-wide" or indirect energy impact. We respond to the comment in relation to each of these types of energy impacts below.

In regard to the energy associated with operating the controls, we explicitly addressed this type of direct energy impact for each of the four BART EGUs. For example, see the text quoted immediately above from EPA's proposed rule for Hunter Unit 1. Furthermore, consistent with the BART Guidelines, we converted the energy associated with operating the controls into dollar costs and factored them into the control cost analysis. Therefore, it is evident that we properly accounted for this type of direct energy impact.

With regard to the energy that must be provided when the unit is removed from service during the installation of controls, this was not included in the energy impacts because the installation of controls can be coordinated with planned outages. This is particularly true given that our FIP allows the sources five years from the date of promulgation to comply with the BART emission limits, and that prolonged planned outages will occur during this time period. Accordingly, no energy must be provided beyond what is already required to meet the shortfall during the already planned outages. Even if this were not the case, and the time to tie-in the SCR would exceed the planned outages, that commenter has not established that the associated loss of revenue due to lost generation would render SCR not cost effective. Given that the cost effectiveness of SCR for the four BART units ranges from $2,697 to $2,928, and that this is very reasonable in comparison to other BART determinations, we anticipate that including the cost of any lost generation would increase the cost effectiveness only marginally. Nor has the commenter demonstrated that the loss in generation capacity during the tie-in of the SCR could not be made up for by other generation sources, as is typically the case during an outage.

Also, while the commenter has asserted that we must assess a third type of energy impacts, "system-wide" energy impacts, this is not consistent with the source-specific nature of BART

and is not supported by the BART Guidelines which direct State's (or EPA acting in place of a state) to consider direct energy impacts, but generally not indirect energy impacts:[497]

> Your energy impact analysis *should consider only direct energy consumption and not indirect energy impacts*. For example, you could estimate the direct energy impacts of the control alternative in units of energy consumption at the source (e.g., BTU, kWh, barrels of oil, tons of coal). The energy requirements of the control options should be shown in terms of total (and in certain cases, also incremental) energy costs per ton of pollutant removed. You can then convert these units into dollar costs and, where appropriate, factor these costs into the control cost analysis.

While the BART Guidelines do allow for consideration of indirect energy impacts under certain circumstances, such as when there is a showing that the impact is unusual or significant and that the impact can be well quantified, the commenter has not made such a showing. That is, the commenter has only speculated that the requirement to install SCR may lead to system-wide impacts, such as the early retirement of BART units. Accordingly, it was appropriate for EPA to only have considered the direct energy impacts.

Comment: [UARG, p. 21] Similarly, in its discussion of energy and non-air quality environmental impacts of compliance, EPA notes thermal efficiency losses, electricity losses, increased ash production, and risk of reagent spills as possible effects of installation and operation of SCR or selective noncatalytic reduction ("SNCR") controls as BART. EPA baldly asserts, however, that these impacts are "insufficient to eliminate *or weigh against* any of the BART options" – without any meaningful analysis or explanation. 81 Fed. Reg. at 2035 (emphasis added); *see also id.* at 2039, 2042-43, 2046. EPA has recently been warned that such an approach is legally insufficient and arbitrary. *See Nat'l Parks Conservation Ass'n v. EPA*, 788 F.3d 1134, 1142-43, 1144 (9th Cir. 2015) (vacating elements of a regional haze FIP due to inadequate explanation by EPA).

Response: We disagree that we have not provided meaningful analysis or explanation in regard to energy and non-air quality impacts. Refer to our response immediately above on this topic. In addition, the court decision cited by the commenter, which pertains to our regional haze FIP for Montana, did not find that EPA failed to provide adequate analysis or explanation in relation to energy and non-air quality environmental impacts. In fact, the decision makes no mention of our consideration of these impacts in Montana beyond listing them among the five statutory factors used to determine BART. It is notable that our evaluation of these impacts for the Utah BART EGUs has been conducted in a very similar manner to that for the Montana BART EGUs at issue in that court decision. As a result, we do not believe that the Montana court decision has any direct bearing on our consideration of the non-air quality environmental and energy impacts for the Utah BART EGUs.

[497] 40 CFR 50 Appendix Y D.IV.h.3.

f. Visibility Improvement

Comment: [UDAQ, p. 23] EPA's BART visibility improvement analyses for its FIP Proposal fails. Specifically, EPA's NO_x BART determinations in its FIP proposal are fatally flawed because EPA did not consider actual monitored data. EPA's proposed FIP should have considered Utah's determination that NO_x reductions did not seem to correlate to visibility improvement during the winter months, that sulfates are the largest contributors to visibility impairment, and that legitimate questions exist about whether further NO_x reductions in the form of SCR at each Utah BART Unit would improve actual visibility in the subject Class I areas. While EPA discussed these matters as part of the SIP Proposal, EPA arbitrarily and capriciously failed to consider these facts as part of its FIP Proposal. Consequently, these shortcomings in EPA's visibility improvement analyses in support of its FIP Proposal are flawed and cannot be used to support the NO_x BART determinations in the proposed FIP.

Response: We disagree that EPA was required to consider the type of weight-of-evidence information suggested by the commenter when selecting BART under the FIP in accordance with §51.308(e)(1) of the RHR. The provision to consider weight-of-evidence is contained in §51.308(e)(2) of the RHR, which pertains only to evaluating alternative measures to BART. As noted by the commenter, and as discussed elsewhere in this document, we have considered monitoring information the State submitted in support of its weight-of-evidence determination within the context of evaluating the BART Alternative.

Comment: [NPS-TC, p. 1] Addition of SCR on Hunter Units 1 and 2 and on Huntington Units 1 and 2 would reduce visibility impacts by six deciviews across eight national parks.

Response: We concur that the addition of SCR will lead to substantial visibility improvements at the affected Class I areas. Refer to the FIP section of our proposed rule and the FRN for the visibility improvements that are anticipated from the installation of SCR (with combustion controls) for the Hunter and Huntington BART units.

Comment: [UPHE, p. 17] Reducing NO_x emitted by PacifiCorp's central Utah fleet by 87% might not double the number of days that the Colorado Plateau's parks and wilderness could be experienced haze free. Its air-clearing effect, however, should be substantial.

Response: We agree that the large NO_x reductions that will be realized at the Hunter and Huntington BART facilities as the result of our FIP will result in substantial visibility benefits. Refer to the FIP section of our proposed rule for the visibility improvements that are anticipated from the installation of SCR (with combustion controls) for the Hunter and Huntington BART units.

Comment: [PacifiCorp, p. 53] *When conducting its* NO_x *BART determinations, EPA failed to consider the limited impact of further* NO_x *reductions.* Finally, EPA's BART-related visibility analyses in the FIP Proposal are also flawed because they fail to account for the limited visibility impacts from NO_x emissions in the relevant Class I areas. As EPA itself admits in the FIP

Proposal, "anthropogenic visibility impairment on the Colorado Plateau is dominated by sulfates . . . sulfate is the largest contributor to visibility impairment at the affected Class 1 areas." See 81 FR at 2031. Additionally, EPA has found that "visibility benefits associated with NO_x reductions are much more likely to occur in the winter months because this is when aerosol thermodynamics favor nitrate formation. By contrast SO_2 emission reductions should provide visibility benefits in all seasons." Id. More importantly, as EPA is well aware, the State of Utah has determined based on its review of the data that "the visibility improvement during the winter months due to NO_x reductions is much more uncertain." Id. EPA further admitted that the State of Utah had presented evidence that "while there has been a reduction in NO_x, the ammonia nitrate values do not show similar improvement in the winter months." Id.

At a minimum, in its FIP Proposal EPA should have considered the fact that Utah had determined that NO_x reductions did not seem to correlate to visibility improvement during the winter months, that sulfates are the largest contributors to visibility impairment, and that legitimate questions exist about whether or not further NO_x reductions in the form of SCR at each Utah BART Unit would in fact improve actual visibility in the subject Class 1 areas. While EPA discussed these matters as part of the SIP Proposal, EPA inexplicably failed to consider these facts as part of its FIP Proposal. Such action was arbitrary and capricious.

Response: We disagree that EPA was required to consider the type of weight-of-evidence information suggested by the commenter when conducting our NO_x BART determinations under the FIP in accordance with §51.308(e)(1) of the RHR. The provision to consider such weight-of-evidence factors is contained in §51.308(e)(2) of the RHR, which pertains only to alternative measures to BART. As discussed elsewhere in this document, we have appropriately considered the State's monitoring information under our weight-of-evidence evaluation.

Nonetheless, we disagree with the commenter's assertions regarding the potential visibility benefits of NO_x versus SO_2, and note that Utah, not EPA, made the statements the commenter cites above. As we explained in our proposed rulemaking,[498] although Utah noted that the "explanation for the lack of improvement in winter nitrate levels may lie in the chemical reactions that lead to the formation of ammonium sulfate and ammonium nitrate,"[499] it did not present sufficient evidence for us to disregard the modeling results and conclude that reducing NO_x emissions will not result in visibility improvements. Additionally, as explained elsewhere in this RTC document, it is not possible to gauge the magnitude of visibility benefits associated with emission reductions from particular sources based solely on monitoring data. We thus do not agree that the assertion that the visibility benefits associated with NO_x reductions will occur only in the winter months or that they will necessarily be less significant than benefits associated with SO_2 reductions.

Comment: [PacifiCorp, p. 54] Additionally, in its FIP Proposal, EPA also should have considered the relevant visibility data and information Utah provided to EPA in its Progress

[498] 81 FR 2004, 2023 (Jan. 14, 2016).
[499] UDAQ Staff Review at 16.

Report for Utah's State Implementation Plan for Regional Haze, dated September 23, 2014 ("Progress Report), Attachment 9. For example, as a result of the Progress Report, EPA is fully aware that Utah's "2008 BART determination has been fully implemented and significant reductions of NO_x, SO_2, and PM have already been achieved." Progress Report at 1. Additionally, the Progress Report explains that three Utah Class I areas show visibility improvement on the most impaired days, and for the two that do not show improvement, the "largest contributor to increases at these sites was particulate organic mass which was associated with large fire events." Id. at 3. The Progress Report also finds that generally "the largest contributors to aerosol extinction at Utah sites were particulate organic mass, ammonium sulfate and coarse mass." Id. at 13. The Progress Report contains other information indicating the relatively minor role NO_x plays in visibility impairment in Utah's Class I areas, and the Progress Report identifies all of the categories of NO_x emission sources (of which the Utah BART Units are but one part of one category). Id. at 25, tbl. 3.8. Unfortunately, EPA's FIP Proposal never discusses or considers the information from the Progress Report, including whether EPA can "reasonably anticipate" visibility improvement from EPA's NO_x BART determinations (SCRs) given the impact from fires, the relatively small impact nitrates have on visibility, and the relatively minor contributions the Utah BART Units make towards the total NO_x emissions that affect the Utah Class I areas. Without considering these issues, EPA cannot truly fulfill its statutory mandate to determine whether or not EPA can "reasonably anticipate" visibility improvement from its FIP Proposal.

Response: Refer to our response immediately above regarding whether EPA was required to consider weight-of-evidence in selecting BART under §51.308(e)(1) of the RHR.

Nonetheless, we disagree with the commenter's implied assertion that NO_x reductions from Hunter and Huntington will not result in visibility improvements at the affected Class I areas. First, while wildfires and dust events may have larger visibility impacts than anthropogenic sources of visibility impairing pollutants on a given day, they do not influence visibility on every meteorological day. At a minimum, reducing emissions from anthropogenic sources will provide visibility improvements on days not subject these extreme natural disturbances. The assertion that reducing emissions from anthropogenic sources may not result in visibility improvements is overbroad and thus inaccurate.

Second, as we explained in our proposed rulemaking,[1] although Utah noted that the "explanation for the lack of improvement in winter nitrate levels may lie in the chemical reactions that lead to the formation of ammonium sulfate and ammonium nitrate,"[1] it did not present sufficient evidence for us to disregard the modeling results and conclude that reducing NO_x emissions will not result in visibility improvements. Additionally, as explained elsewhere in this RTC document, it is not possible to gauge the magnitude of visibility benefits associated with emission reductions from particular sources based solely on monitoring data. We thus do not agree that the assertion that the visibility benefits associated with NO_x reductions will occur only in the winter months or that they will necessarily be less significant than benefits associated with SO_2 reductions. The commenter presents no additional evidence or support for this assertion that

would lead us to alter our conclusions regarding potential visibility benefits associated with NO_x reductions at Hunter and Huntington.

Finally, Congress declared a national goal of preventing any future, and remedying any existing, impairment of visibility in Class I areas resulting from manmade air pollution.[1] The regional haze program is premised on the understanding that visibility impairment often results from many diverse and distributed sources of visibility impairing pollutants. The very nature of the problem indicates that states will have to maximize reasonably-obtainable emission reductions from a significant portion of the sources that contribute to visibility impairment in order to achieve the statutory goal. Congress has also specified that large sources of visibility impairing pollutants such as Hunter and Huntington be part of the solution to regional haze. As explained elsewhere in this RTC document, these facilities are significant sources of visibility impairing pollutants, including NO_x. Such sources must lead the way by reducing emissions to the fullest reasonable extent if the regional haze program is to achieve the congressional aim of eliminating visibility impairment from anthropogenic air pollution. The commenter's assertion that EPA should disregard the significant modeled visibility benefits of emission reductions on the chance that those benefits might not be as great as we anticipate is inconsistent with this goal.

g. FIP CALPUFF Modeling

Comment: [PacifiCorp, p. 3] Visibility Improvements. The visibility improvements of EPA's FIP Proposal are not reasonably anticipated from the installation of SCR because (1) EPA failed to account for the margin of error in the CALPUFF model and other material limitations of CALPUFF; (2) EPA summed up the per unit improvements rather than modeling all four BART units together; and (3) EPA failed to properly account for the limited impact of additional NO_x reductions.

Response: We disagree with the commenter that the visibility improvements in our FIP Proposal are not reasonably anticipated. Our responses regarding our use of the CALPUFF model, our modeling protocol, and the role of NO_x emissions in the weight-of-evidence analysis are found elsewhere in this document. Here we focus on interpretation of the statutory text.

We do not agree that commenter has correctly defined and applied a "margin of error" concept to the CALPUFF modeling, for reasons given in the other responses. In the first part of this response, though, for the sake of argument we are accepting the general premise that a CALPUFF value can fall within a margin of error. We also maintain, for reasons explained elsewhere, that commenter has failed to show that this hypothetical situation exists in the particular application of CALPUFF in this action.

First, we disagree that "reasonably anticipated" means "certain to occur." This is the implication of commenter's argument that a CALPUFF result within a purported margin of error cannot show that a visibility improvement is "reasonably anticipated." The phrase "reasonably anticipated" is ambiguous and susceptible of interpretation. It is certainly reasonable to anticipate the degree of visibility improvement that results from the correct application (i.e. with an

appropriate modeling protocol) of the regulatorily approved modeling tool, even if that degree of improvement is within an alleged margin of error. By comparison, it would likely be unreasonable to anticipate a degree of visibility improvement that is, to take an extreme example, 10 times more than (or 10 times less than) what the regulatorily approved modeling tool shows, or that results from an erroneous modeling protocol. This shows that an interpretation of "reasonably anticipated" that corresponds to the degree of visibility improvement shown by the approved modeling tool, when used correctly, is consistent with the statutory terms, including "reasonably."

On the other hand, commenter's implied interpretation of "reasonably anticipated," i.e. "certain to occur," would be contrary to the purposes of the statute and write the term "reasonably" out of it. One reason is that all models have an inherent uncertainty. As discussed in EPA's modeling guidance:

> Dispersion models generally attempt to estimate concentrations at specific sites that really represent an ensemble average of numerous repetitions of the same event. The event is characterized by measured or "known" conditions that are input to the models, e.g., wind speed, mixed layer height, surface heat flux, emission characteristics, etc. However, in addition to the known conditions, there are unmeasured or unknown variations in the conditions of this event, e.g., unresolved details of the atmospheric flow such as the turbulent velocity field. These unknown conditions, may vary among repetitions of the event. As a result, deviations in observed concentrations from their ensemble average, and from the concentrations estimated by the model, are likely to occur even though the known conditions are fixed. Even with a *perfect model* that predicts the correct ensemble average, there are likely to be deviations from the observed concentrations in individual repetitions of the event, due to variations in the unknown conditions. The statistics of these concentration residuals are termed "inherent" uncertainty. Available evidence suggests that this source of uncertainty alone may be responsible for a typical range of variation in concentrations of as much as ±50 percent.

40 CFR part 51, Appendix W, 9.1.1.a. Thus, according to the currently promulgated version of Appendix W, even given a "perfect model," uncertainty can be as much as ±50 percent. Given this, commenter's interpretation of "reasonably anticipated" would require modeling results to be discarded *if they fell within the range of inherent uncertainty*. In other words, under commenter's theory it would simply be impossible to weigh this BART factor, even in the case of a perfect model, when the values were small.

Thus, commenter's implied interpretation of "reasonably anticipated" cannot be what Congress intended. This is true even more so in light of the fact that the BART provisions were added in the 1977 Amendments. At the time, uncertainties with modeling were a great concern – for example, many states used unsophisticated rollback models for their attainment plans, resulting in decisions to control sources that were not well supported. *See, e.g.*, *Cleveland Electric Illuminating Co. v. EPA*, 572 F.2d 1150, 1160-61 (6th Cir. 1978). Given the context, Congress

cannot have intended "reasonably anticipated" to mean "certain to occur." A much more plausible interpretation of "reasonably anticipated" is "can be predicted using current models."

We also note that, viewed properly, this comment was addressed by the BART Guidelines themselves. As shown by the above discussion, the commenter's theory is not about the application of a model to a particular situation, it is about the interpretation of the statute itself. When we promulgated the BART Guidelines, we essentially interpreted the phrase "degree of improvement in visibility which may reasonably be anticipated" to be the visibility improvement predicted by CALPUFF, or another appropriate dispersion model.[500] See 40 CFR part 51, Appendix Y, IV.D.5 ("Use CALPUFF, or other appropriate dispersion model to *determine the visibility improvement expected at a Class I area from the potential BART control technology applied to the source*.") (emphasis added).

Another way to see that this comment is actually an attack on the BART Guidelines is to consider the consequences of accepting it. The comment, if it had any validity, which it does not, would apply with equal force to CALPUFF modeling used to determine whether BART-eligible sources should be subject to BART because they cause or contribute to visibility impairment at Class I areas. In this regard, the statute makes BART applicable to stationary sources in operation during certain dates that "emit[] any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility" in Class I areas. CAA § 169A(b)(2)(A) (emphasis added). Under the Guidelines, the recommended deciview thresholds for causing or contributing are 1.0 dv and 0.5 dv, respectively. According to the commenter, at least the latter value is within their alleged "margin of error" for CALPUFF, which again is the recommended modeling tool. Thus, under commenter's theory, the Guidelines would simply cease to function if the recommended tool were used.

We also note that existing case law on the interpretation of this statutory phrase (i.e. in 169A(b)(2)(A)) supports our interpretation of the similar phrase in 169A(g)(2). In *Central Arizona Water Conservation Dist. v. EPA*, 990 F.2d 1531 (9th Cir. 1993), the Court reviewed an EPA FIP requiring SO_2 reductions at Navajo Generating Station. EPA issued the FIP pursuant to the reasonably attributable visibility impairment (RAVI) rules in place at the time; however the triggering of RAVI applicability was governed by the same statutory phrase in 169A(g)(2). The Court stated:

> Congress mandated an extremely low triggering threshold, requiring the installment of stringent emission controls when an individual source "emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility" in a class I Federal area. 42 U.S.C. § 7491(b)(2)(A). The National Academy of Sciences correctly noted that Congress has not required ironclad scientific certainty establishing the precise relationship between a source's emission[s] and resulting visibility impairment:

[500] This is precisely the same interpretation as the one we offered at the beginning of this response.

> The phrase "may reasonably be anticipated" suggests that Congress did not intend to require EPA to show a precise relationship between a source's emissions and all or a specific fraction of the visibility impairment within a Class I area. Rather, EPA is to assess the risk in light of policy considerations regarding the respective risks of overprotection and underprotection.

Central Arizona Water Conservation Dist. v. EPA, 990 F.2d 1531, 1541 (9th Cir. 1993) (quoting National Research Council, Haze in the Grand Canyon: An Evaluation of the Winter Haze Intensive Tracer Experiment (1990) at 5). Since the degree of visibility improvement that may reasonably be anticipated from controls is necessarily smaller than the overall impairment from a source, the point applies with at least as much and perhaps even greater force to the BART factor in 169A(g)(2).

Returning to the BART Guidelines: The public had opportunity to comment on the issue of model uncertainty and the cause or contribute thresholds in the BART Guidelines. And they did:

> The standard CALPUFF modeling run provides day-by-day estimates of a source's visibility effects over a five-year period. In the proposed BART guideline, we indicated that if the maximum daily visibility value at any receptor over the five years modeled is greater than the "cause or contribute" threshold, then the State should conclude that the source is subject to BART. A number of commenters took issue with our proposal to use the 24-hour maximum modeled visibility impact over five years of meteorological data. Several of them pointed out, for example, that the maximum modeled 24-hour impact may be an outlier unduly influenced by weather. We agree that the maximum modeled effect in a five-year period could be the result of unusual meteorology. We also recognize that, although CALPUFF is the best currently available tool for analyzing the visibility effects of individual sources, it is a model that includes certain assumptions and uncertainties. Thus, we agree with commenters that a State should not necessarily rely on the maximum modeled impact in determining whether a source may reasonably be anticipated to contribute to visibility impairment in a Class I area.
>
> The final guideline states that it would be reasonable for States to compare the 98th percentile of CALPUFF modeling results against the "contribution" threshold established by the State for purposes of determining BART applicability. Some stakeholders have argued for the 90th percentile value, or even lower, contending that EPA should not use extreme cases to make BART applicability decisions. EPA agrees that, in most cases, important public policy decisions should not be based on the extreme tails of a distribution. We have concluded, however, that the 98th percentile is appropriate in this case.
>
> The use of 90th percentile value would effectively allow visibility effects that are predicted to occur at the level of the threshold (or higher) on 36 or 37 days a year. *We do not believe that such an approach would be consistent with the language of the statute.* Second, we note that the 98th percentile value would only be used to determine whether a

> particular BART-eligible source would be subject to further review by the State. In determining what, if any, emission controls should be required, the State will have the opportunity to consider the frequency, duration, and intensity of a source's predicted effect on visibility.
>
> On the other hand, there are other features of our recommended modeling approach that are likely to overstate the actual visibility effects of an individual source. Most important, the simplified chemistry in the model tends to magnify the actual visibility effects of that source. Because of these features and the uncertainties associated with the model, we believe it is appropriate to use the 98th percentile--a more robust approach that does not give undue weight to the extreme tail of the distribution. The use of the 98th percentile of modeled visibility values would appear to exclude roughly 7 days per year from consideration. In our judgment, this approach will effectively capture the sources that contribute to visibility impairment in a Class I area, while minimizing the likelihood that the highest modeled visibility impacts might be caused by unusual meteorology or conservative assumptions in the model.

70 FR 39104, 39121 (July 6, 2005) (emphasis added). Thus, in interpreting the statute, we took into account model uncertainty, and reasonably addressed it by using the 98th percentile value.

The public also had the opportunity to comment on the issue of model uncertainty when used to determine the degree of visibility improvement resulting from controls (instead of the causing or contributing issue). It appears from the preamble that they may not have, but in any case the solution was the same: to use the 98th percentile value. Thus, we fully addressed the commenter's concern in a reasonable manner when we promulgated the BART Guidelines, and furthermore the time to challenge the Guidelines has passed.

Finally, the degree of visibility improvement from controls is a relative determination. The determination may be the degree of visibility improvement of one control scenario relative to an uncontrolled baseline, or it may be the degree of visibility improvement of one control scenario relative to another control scenario. As we explain in the weight-of-evidence section of the RTC, CALPUFF is reliable for determining relative differences between situations, even when the difference is small. There, we recognize that the difference in visibility improvement between BART and the BART alternative is small, and treat it accordingly in the weight-of-evidence analysis. Here, the degree of visibility improvement from the control scenarios is much larger—among the largest for any Western fossil-fuel fired power plant—and we weight that accordingly as well. This is precisely what Congress intended in determining BART: that States (or EPA in a FIP) consider the degree of visibility improvement that can reasonably be anticipated from the BART control scenarios. That a small visibility improvement might fall within an alleged margin of error is a complete red herring – a small visibility improvement will be weighed less in the BART determination, which is perfectly in line with the statute and Congress' intent.

Comment: [PacifiCorp p. 52] *EPA made material, problematic changes in its modeling that prohibit comparisons with other modeling runs.* EPA also claims that, beyond "assessing impacts from individual BART sources and evaluating all technically feasible control options," its modeling was "otherwise very similar to that employed by Utah." 81 FR at 2033. Again, EPA is mistaken. EPA's CALPUFF modeling: (1) modeled different sources than Utah's modeling; and (2) used different assumptions about the amount of sulfate, nitrate, and particulate emissions. See Hoffnagle Report at 15-16.

a. *Modeling only individual BART Units resulted in erroneous modeling results and unsupportable BART visibility improvement analyses.* EPA admits that its CALPUFF model only included the "the impacts of the individual BART sources." See 81 FR at 2033. EPA also admits it determined a "source's" impact (two units at the same facility) by "summing the per unit improvements from Units 1 and 2" of Hunter. See e.g., 81 FR at 2037. This was a mistake. EPA should have modeled all four Utah BART Units together with SCR controls and two units at the same source (power plant) together with SCR controls. "When all the plants are run together the model would show a far smaller deciview impact than any additive result of running them separately. Each plume competes for the relatively small amount of ammonia assumed in the model. Once the ammonia is gone no more nitrate can be produced." See Hoffnagle Report at 15.

EPA claims in its FIP Proposal that a BART analysis must include "consideration of the visibility improvement from BART applied to the subject-to-BART source as a whole." See 81 FR at 2033. However, this is not how EPA conducted its CALPUFF modeling. EPA did not conduct CALPUFF modeling for the "subject to-BART source as a whole," but rather conducted CALPUFF modeling individually for each BART unit. EPA cannot simply "add" modeled visibility improvement numbers for each unit at a source to determine the source's impact; CALPUFF modeled results are not linear. Rather, the impact of the combined units' emissions must be considered by the CALPUFF model because of the atmospheric chemistry and the limiting factors (such as ammonia, etc.) on visibility impacts.

EPA also improperly excluded the reductions from the closure of the Carbon plant and reductions from Hunter Unit 3 when it conducted its CALPUFF modeling. "EPA's model runs never include the Carbon Plant and thus miss the reductions in nitrate and, more importantly, sulfate that occur because of those reductions." Hoffnagle Report at 15-16. Refusing to recognize Hunter Unit 3's installed emissions controls "skews the analysis in favor of more visibility improvement for the single unit SCR." Id. EPA's BART visibility analyses are invalid because the CALPUFF model runs did not include all Utah BART Units together, or as sources, or Carbon, or Hunter Unit 3, which skewed the results.

b. *EPA failed to include sulfate and particulate matter emissions from the Utah BART Units when modeling.* For some unknown and unsupportable reason, EPA reduces stack emissions of sulfate and particulate matter to almost zero in the EPA's CALPUFF modeling for the Utah BART Units. See Hoffnagle Report at 16. This modeling mistake "enhances the decrease in deciviews from EPA's model runs attributed to the use of SCR perhaps to a significant extent." Id. EPA also reduces sulfates, particulate matter, and nitrates emissions for Hunter Unit 3. These

unexplained changes "are reason to call EPA's benefits from SCR into question." Id. EPA's BART visibility analyses are invalid as a result, as is EPA's FIP Proposal.

Response: As an initial matter, the commenter conflates two separate modeling efforts: (1) the modeling conducted by the State to support its BART alternative in accordance with §51.08(e)(2) of the RHR, which pertains to alternatives measures to BART, and (2) the modeling conducted by EPA to support its FIP in accordance with §51.308(e)(1) of the RHR, which pertains to BART. The State's BART Alternative included emission reductions from the Carbon power plant and Hunter Unit 3 in attempt to demonstrate that it achieves greater reasonable progress than the BART benchmark (SCR on the four subject-to-BART EGUs). Therefore, it was appropriate for the State to include emission reductions from these non-BART sources in their analysis. However, EPA's modeling analysis, intended for an entirely different purpose, which was to assess the relative benefits of BART control options at the subject-to-BART units, properly excluded the emission reductions from the non-BART units from the analysis. Accordingly, EPA's modeling results for BART should not be compared to the State's modeling results for the BART Alternative.

The commenter is correct that in our CALPUFF modeling we treated each unit and control option separately. However, we then combined the units at each BART source in the post-processing performed in POSTUTIL such that the commenter's concern regarding atmospheric chemistry and the limiting factors (such as ammonia, etc.) is addressed. The combinations of units/controls modeled for each BART source are clearly shown in Table 5 of EPA's modeling protocol[501] that is located in the docket. As can be seen in Table 5, in POSTUTIL we combined CALPUFF model results for Hunter Units 1, 2, and 3, and separately, we also combined CALPUFF results for Huntington Units 1 and 2. Nonetheless, we understand the commenter to mean that we did not combine model runs reflecting installation of SCR in POSTUTIL, and this is correct. Instead, we combined the SCR emissions for one unit with the baseline emissions from another unit in POSTUTIL. In order to address the commenter's concern, we have performed additional post-processing of the CALPUFF results. Refer to Tables 6 and 7 below.[502] In the post-processing runs, we combined the CALPUFF results for the SCR scenario (with combustion controls) at Hunter Units 1 and 2. Separately, we did the same for the two Huntington units. Contrary to the claim made by the commenter, the outcome is that the combined visibility benefit is in most cases greater than when simply summing the individual visibility benefits.[503] For example, at the most impacted Class I area, Canyonlands National Park, the individual visibility benefits from SCR at the two Hunter units are 1.545 dv and 1.250 dv, summing to 2.795 dv. However, when modeled together, the combined benefit is 2.948 dv. A similar phenomenon occurs with the Huntington BART source. Accordingly, we find that modeling the SCR benefits together does not show far smaller deciview improvements than the additive result of modeling them separately.

[501] Air Quality Modeling Protocol: Utah Regional Haze Federal Implementation Plan, EPA, November 2015.
[502] Also see SUPPLEMENT Air Quality Modeling Protocol: Utah Regional Haze Federal Implementation Plan [November 2015] May 2016, U.S. EPA Region 8.
[503] At some of the least impacted areas, such Black Canyon of the Gunnison National Park, the sum of the individual SCR benefits was slightly higher than when modeled together.

Table 6. Summary of Source-Wide Visibility Impacts and Improvements for Hunter

Class I Area	Baseline Visibility Impacts			BART (SCR + LNB/SOFA) Impacts (Improvements shown in parentheses)		
	Impacts (dv)	Days > 0.5 dv	Days > 1.0 dv	Impacts (dv)	Days > 0.5 dv	Days > 1.0 dv
Arches NP	4.601	293	170	1.981 (2.62)	158 (135)	71 (99)
Black Canyon NP	1.097	68	22	0.481 (0.616)	14 (54)	1 (21)
Bryce Canyon NP	1.833	42	22	0.811 (1.022)	20 (22)	6 (16)
Canyonlands NP	5.356	359	240	2.408 (2.948)	223 (136)	111 (129)
Capitol Reef NP	4.606	175	118	2.171 (2.435)	114 (61)	55 (63)
Flat Tops Wilderness	1.281	77	31	0.537 (0.744)	22 (55)	1 (30)
Grand Canyon NP	1.891	49	32	0.730 (1.161)	25 (24)	9 (23)
Mesa Verde NP	1.327	82	32	0.514 (0.813)	21 (61)	4 (28)
Zion NP	0.963	29	14	0.369 (0.594)	10 (19)	4 (10)

Note: The baseline impacts are the combined impacts from all three units at Hunter, while the BART source is comprised of only units 1 and 2. EPA's evaluation of visibility under BART relies only on the visibility benefits associated with controls on the two BART units.

Table 7. Summary of Source-Wide Visibility Impacts and Improvements for Huntington

Class I Area	Baseline Visibility Impacts			BART (SCR + LNB/SOFA) Impacts (Improvements shown in parentheses)		
	Impacts (dv)	Days > 0.5 dv	Days > 1.0 dv	Impacts (dv)	Days > 0.5 dv	Days > 1.0 dv
Arches NP	3.887	237	146	0.848 (3.039)	67 (170)	18 (128)
Black Canyon NP	0.773	45	16	0.196 (0.577)	1 (44)	0 (16)
Bryce Canyon NP	1.221	36	19	0.326 (0.895)	4 (32)	0 (19)
Canyonlands NP	5.130	277	175	1.282 (3.848)	89 (188)	31 (144)
Capitol Reef NP	3.389	131	91	0.986 (2.403)	42 (89)	9 (82)
Flat Tops Wilderness	0.926	64	17	0.216 (0.710)	2 (62)	0 (17)

Grand Canyon NP	1.107	40	19	0.190 (0.806)	4 (36)	0 (19)
Mesa Verde NP	1.115	63	22	0.261 (0.854)	0 (63)	0 (22)
Zion NP	0.820	21	11	0.211 (0.609)	3 (18)	0 (11)

The commenter also asserts that not only should EPA have modeled two units at the same source together with SCR controls, but that EPA should have done the same for all four of the Utah BART EGUs (two at the Hunter power plant, and two at the Huntington power plant). We disagree because the BART Guidelines direct states (or EPA in place of a state) to "[c]alculate the model results for each receptor as the change in deciviews compared against natural visibility," [504]; they do not direct states to model the visibility impacts of BART sources against the emissions from other sources.

The commenter also asserts that EPA should have included the emission reductions from the Carbon power plant and Hunter Unit 3, neither of which is subject-to-BART, in the modeling supporting our FIP. Again, here the commenter confuses the two separate modeling efforts (the State's and EPA's) and their respective purposes.

Finally, we disagree that we did not include sulfate and particulate matter emissions from the Utah BART units in our CALPUFF modeling, or that we treated them in a manner that unduly favored SCR. Our emissions assumptions for modeling, including for sulfate and particulate matter, are clearly presented in Section 3.3 and Appendix B of our modeling protocol. The assumptions for sulfate and particulate matter emissions are identical to those used by the state for like control technologies. Moreover, it is not possible for our emission assumptions for these two species to have enhanced the visibility improvement from SCR in our FIP modeling as suggested by the commenter. For all scenarios modeled by EPA, the emission rates for particulate matter are constant. For example, the modeled emission rate for $PM_{2.5}$ at Hunter 1 is 29.3 lb/hr in the baseline, for LNB/SOFA, for LNB/SOFA and SNCR, and for LNB/SOFA and SCR). See the table below that is reproduced from EPA's protocol. Therefore, because visibility improvement is taken as the difference between the impact in the control case and the impact in the baseline, and the particulate emission rate is held constant, it has no effect on the modeled visibility improvement from SCR. Similarly, the emission rates for sulfate are constant for most of the scenarios, *increasing* only in the SCR scenario. For example, the modeled emission rate for sulfate at Hunter 1 is 0.11 lb/hr in the baseline, for LNB/SOFA, and for LNB/SOFA and SNCR, but 1.64 lb/hr for LNB/SOFA and SCR. This would have the effect of decreasing the visibility improvement from SCR, which is exactly the opposite of what the commenter claims. In any case, the emissions of these two species are small in comparison to that from SO_2 and NO_x, such that they have little bearing on the modeled visibility results. See table below.

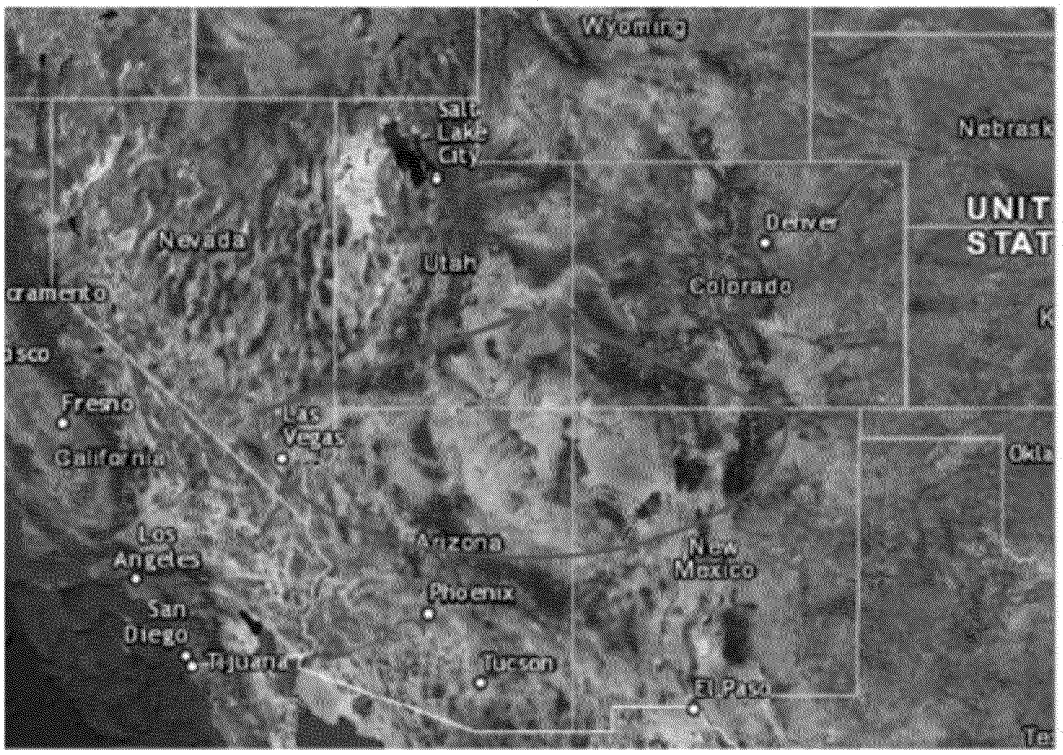
[504] 70 FR 39104, 39170 (July 6, 2005).

Table 8. – Modeling Assumptions for PacifiCorp - Hunter Unit 1

CALPUFF Inputs	Baseline	LNB/SOFA	LNB/SOFA/SNCR	LNB/SOFA/SCR
SO_2 (lb/hr)	570	570	570	570
Total Sulfate (SO_4)(lb/hr)	0.11	0.11	0.11	1.64
NO_x (lb/hr)	2388	1202	944.772	298
HNO_3	0	0	0	0
NO_3	0	0	0	0
EC	0.219	0.219	0.219	0.219
SOA	4.75	4.75	4.75	4.75
$PM_{2.5}$ (lb/hr)	29.329	29.329	29.329	29.329
$PM_{10\ -2.5}$ (coarse PM)(lb/hr)	1.33	1.33	1.33	1.33
Stack Height (meters)	183	183	183	183
Base Elevation (meters)	1720	1720	1720	1720
Stack Diameter (meters)	7.3	7.3	7.3	7.3
Exit Velocity (meters/second)	17.3	17.3	17.3	17.3
Exit Temperature (Kelvin)	317	317	317	317

Altogether, the commenter confuses the State's SIP modeling and EPA's FIP modeling, and their respective purposes. In addition, the commenter misunderstands EPA's modeled emission rates for some species that figure very little into the overall modeled visibility impacts. Accordingly, we find that the commenter is mistaken when asserting that our FIP visibility modeling analysis is invalid.

Comment: [PacifiCorp, p. 54] *EPA Failed to Consider Wind Direction Data* – The following chart represents the wind direction for the 2001-2003 20% worst days when the nitrate contribution to haze was equal to or greater than 0.5 deciviews. See Attachment 10. The wind direction for these 20% worst days ranged from 115 degrees to 249 degrees. As can be seen, the prevailing winds do not come from the direction of the Utah BART Units. Therefore, EPA cannot "reasonably anticipate" visibility improvement on the 20% worst days resulting from the installation of the BART Benchmark at the Utah BART Units. This failure alone invalidates the FIP Proposal.



Response: Contrary to the commenter's assertion, EPA *did* consider wind direction data in our evaluation of expected visibility improvements from controls, as these data were among the inputs into our CALPUFF modeling. It is important to note, however, that many meteorological factors other than wind direction can affect visibility impacts and improvements. That is why the BART Guidelines recommend the use of CALPUFF or another dispersion model capable of accounting for different meteorological factors to evaluate visibility impacts and improvements. See 40 CFR part 51, appendix Y, Section III and Section IV.D.5. Consistent with this recommendation, we used CALPUFF to evaluate expected visibility improvements from potential control options. Our CALPUFF modeling employed three years of hourly meteorological input, based on meteorological modeling as well as observational data from stations throughout a large area. The meteorological input incorporates wind speed and direction, including the particular wind direction patterns noted by the commenter. In particular, as stated in our modeling protocol, we used the meteorological data provided by the State of Utah for years 2001 to 2003. Thus, we did consider wind direction data as part of our evaluation of expected visibility improvements.

We do not agree with the commenter's suggestion that we should have specifically considered wind direction data associated with the 20% worst visibility days when the nitrate contribution to haze was equal to or greater than 0.5 deciviews. Such an approach would be inconsistent with the BART Guidelines in at least three respects. First, as previously noted, the Guidelines recommend use of dispersion modeling, rather than consideration of individual meteorological factors such

wind direction. Second, the BART Guidelines recommend consideration of changes in deciviews compared against natural visibility conditions.[505] By contrast, the commenter identified particular days based on 2001-2003 monitoring data that reflect current, degraded conditions, rather than natural conditions.[506] Third, the BART Guidelines recommend use of the 98th percent days (i.e. the 98th percentile of the days when the particular source in question has the greatest impact) for evaluating expected improvements in visibility from potential controls.[507] By contrast, the commenter focuses on the overall 20% worst days with a nitrate contribution to haze of equal to or greater than 0.5 deciviews, regardless of the expected impacts of the particular sources in question. Thus, the particular approach suggested by the commenter is inconsistent with the BART Guidelines and is not an appropriate method of evaluating expected visibility improvements as part of a BART analysis.

Comment: [PacifiCorp -- Hoffnagle Report, p. 1] EPA contends in its proposed federal implementation plan (FIP) that modeled visibility improvement numbers on the order of less than 1 deciview down to 0.02 deciviews in the modeling analysis are sufficient to impose selective catalytic reduction (SCR) controls on the four subject power plant units. However, EPA admits (page 2009 of the proposed FIP) that "*most people can detect a change in visibility at one dv*" (deciview).

Response: We do not agree with the commenter that the expected visibility benefits of controls at these units are less than what is generally considered perceptible (1.0 deciview). For example, the expected visibility benefit of LNB with SOFA and SCR at Hunter 1 alone is greater than 1 dv at three different class I areas. When considered on a source-wide basis the expected benefit of SCR on Hunter Units 1 and 2 is 2.948 dv at the most affected area. Similarly, the expected visibility benefit of LNB with SOFA and SCR at Huntington 1 alone is greater than 1 dv at three different class I areas and the expected source-wide benefit of SCR on Huntington Units 1 and 2 is 3.848 at the most affected area.

Furthermore, the BART Guidelines are clear that visibility improvements that are less than perceptible should be considered: ''Even though the visibility improvement from an individual source may not be perceptible, it should still be considered in setting BART because the contribution to haze may be significant relative to other source contributions in the Class I area. Thus, we disagree that the degree of improvement should be contingent upon perceptibility. Failing 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.''[508] In addition, as explained in our proposal, States and EPA have selected SCR as BART where the expected visibility benefits were similar or even less than the benefits from SCR expected at Hunter and Huntington.[509]

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[505] *See* 40 CFR part 51, appendix Y, section IV.D.5; 70 FR 39104, 39124.
[506] PacifiCorp Comments, Attachment 10.
[507] *See* 40 CFR part 51, appendix Y, section IV.D.5; 70 FR 39104, 39121 (explaining EPA's recommendation to use the 98th percentile value).
[508] 70 FR 39129.
[509] See, e.g. 80 FR 2037-2038.

Accordingly, when the visibility improvements are considered along with the other statutory factors, we continue to find that these benefits justify the selected BART controls.

Comment: [PacifiCorp -- Hoffnagle Report, p. 6] The field studies used to evaluate the CALPUFF model used inert tracers and therefore the model performance has only been evaluated for transport of inert tracers. The evaluation did not consider atmospheric chemistry and thus the evaluation is not relevant for evaluating changes in visibility.

Response: We acknowledge the background information provided by the commenter. Our use of the current EPA-approved version of CALPUFF (Version 5.8.4, Level 130731) is described elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, p. 6] All but one of the field study comparisons is on flat terrain and are unlike Utah which has complex terrain.

Response: We acknowledge the background information provided by the commenter. Our use of the current EPA-approved version of CALPUFF (Version 5.8.4, Level 130731) is described elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, pp. 6, 13] The comparison of CALPUFF to field studies showed that at a distance of 100 km CALPUFF over predicted inert tracers by 5% to 250% with a mean error of 96%, and the data do not support the IWAQM conclusion that CALPUFF can be used at distances up to 300 km. The mean error only represents the error in transport, it does not include additional errors in atmospheric chemistry. Table 1 also summarizes CALPUFF error for inert tracers in the CAPTEX and ETEX field studies based on the 2012 ENVIRON report. CALPUFF is not reliable for distances up to 300 km.

Response: We acknowledge the background information provided by the commenter. Our response to the reliability of CALPUFF used for distances up to 300 km is provided elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, p. 7] …as best that could be determined from the Savannah River and Great Plains experiments (Table 2 of EPA-454/R-98-009) at the time there is an error rate of 79% and always greater than the measured concentration. The error rate can be expected to become worse at distances beyond 100 kilometers, but we only know what happens at 600 kilometers where the model is clearly not consistent with the experimental results. The "margin of error" identified in the aforementioned studies is hereafter referred to as the "transport/diffusion margin of error" because these studies measured CALPUFF v. 5.8's accuracy relative to long-range transport and diffusion.

Response: We respond to the reliability of CALPUFF across distances elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, p. 7] The owners of CALPUFF (first TRC and then EXPONENT) have prepared more advanced versions of CALPUFF that have not been adopted by EPA. The focus of these advancements have been in providing better atmospheric chemistry based on twenty years of advancement in atmospheric chemistry science. AQMG has steadfastly refused to give anything more than acknowledgement to these advancements and yet continuously criticizes CALPUFF for not having advanced chemistry.

Response: We respond to our use of the current EPA-approved version of CALPUFF (Version 5.8.4, Level 130731) elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, pp. 7-9] In May 2012, EPA released a report entitled "Documentation of the Evaluation of CALPUFF and Other Long Range Transport Models Using Tracer Field Experiment Data", EPA-454/R-12-003 (Environ Report). The Environ Report does provide statistical evaluations of the CALPUFF Mean Normalized Bias (MNB), essentially the margin of error, which is the objective of this report. The results can be summarized as follows:

Table 1: Margin of Error for CALPUFF

Comparisons to Field Studies				
		Maximum Observed Percent MNB*		Centerline Percent MNB
Great Plains				
	100 km.	65%		84%
	600 km.	-75%		-76%
Savannah River				
	100 km.	71%		221%
CAPTEX				
	all receptors 100-1000 km.	41%	**	
ETEX				
	all receptors 50-1400 km.	320%	**	
* Mean Normalized Bias				
**Normalized Mean Square Error				

The conclusion that can be derived from Table 1 is that the margin of error for CALPUFF version 5.8 is around 70% for the maximum observed concentration with many signals that the error is higher. The error is always on the high side and we can say little about the margin of error beyond 100 kilometers. This margin of error covers only the transport and diffusion aspects of the long range transport and not the atmospheric chemistry since all the experiments were done with inert tracers.

Response: In promulgating the 2005 BART guidelines, we responded to comments concerning the limitations and appropriateness of using CALPUFF. There we explained that:

> CALPUFF is the best modeling application available for predicting a single source's contribution to visibility impairment. It is the only EPA-approved model for use in estimating single source pollutant concentrations resulting from the long range transport of primary pollutants. In addition, it can also be used for some purposes, such as the visibility assessments addressed in today's rule, to account for the chemical transformation of SO_2 and NO_x. As explained above, simulating the effect of precursor pollutant emissions on PM2.5 concentrations requires air quality modeling that not only addresses transport and diffusion, but also chemical transformations. CALPUFF incorporates algorithms for predicting both. At a minimum, CALPUFF can be used to estimate the relative impacts of BART-eligible sources. *We are confident that CALPUFF distinguishes, comparatively, the relative contributions from sources such that the differences in source configurations, sizes, emission rates, and visibility impacts are well-reflected in the model results.*[510]

EPA also recognized the uncertainty in the CALPUFF modeling results when EPA made the decision (in the final BART Guidelines) to recommend that the model be used to estimate the 98th percentile visibility impairment rather than the highest daily impact value. We made the decision to consider the less conservative 98th percentile primarily because the chemistry modules in the CALPUFF model are simplified and likely to provide conservative (higher) results for peak impacts. Since CALPUFF's simplified chemistry could lead to model over predictions, EPA recommended the use of the 98th percentile to avoid giving undue weight to the extreme tail of the distribution.[511] Therefore, in recognizing some of the limitations of the CALPUFF model, we determined that use of the maximum modeled impact may be overly conservative and recommended the use of the 98th percentile value. While recognizing the limitations of the CALPUFF model in the BART Guidelines preamble, EPA concluded that, for the specific purposes of the Regional Haze Rule's BART provisions, CALPUFF is sufficiently reliable to inform the decision making process.[512]

It is further worth noting that the CALPUFF model can both underpredict and overpredict visibility impacts compared to a photochemical grid model. For example, the 2012 ENVIRON report on *Comparison of Single-Source Air Quality Assessment Techniques for Ozone, PM2.5, other criteria pollutants and AQRVs* found that CALPUFF's predictions of the highest 24-hr nitrate and sulfate concentrations were lower than those predicted by the CAMx photochemical

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[510] 70 FR 39104, 39122 (emphasis added).
[511] 70 FR 39104, 39121 ("Most important, the simplified chemistry in the model tends to magnify the actual visibility effects of that source. Because of these features and the uncertainties associated with the model, we believe it is appropriate to use the 98th percentile—a more robust approach that does not give undue weight to the extreme tail of the distribution." 70 FR 39104, 39121.
[512] 70 FR 39104, 39123.

grid model in some areas within the modeling domain.[513] Thus, while there is some uncertainty in the absolute visibility impacts and benefits due to the model and some of the simplifications and assumptions used in the BART Guidelines modeling approach, the relative level of impact is a reliable assessment of the degree of visibility impacts and benefit from controls. Any uncertainties in meteorological conditions that govern the transport and diffusion of pollutants are less important in comparing impacts between two control scenarios, since the same effects will be included in both the base and the control scenario model simulations.

Finally, as explained elsewhere in this document, the legal deadline for challenging EPA's recommendation to use CALPUFF in BART analyses has passed and we consider it appropriate to continue using CALPUFF for BART determinations, given that the vast majority of BART determinations have been made using CALPUFF

Comment: [PacifiCorp -- Hoffnagle Report, p. 9] AQMG at EPA developed a replacement meteorological preprocessor to replace CALMET, the CALPUFF system preprocessor. The objective of the Mesoscale Model Interface (MMIF) was to take National Weather Service data and feed it directly to CALPUFF or any other model. One of MIFF's failings is that it does not include any terrain influences that are not resolvable at the grid spacing of the NWS data. For Utah it would miss most of the terrain.

Response: We acknowledge the background information submitted by the commenter. However, we did not use the Mesoscale Model Interface (MMIF) in our modeling for this action.

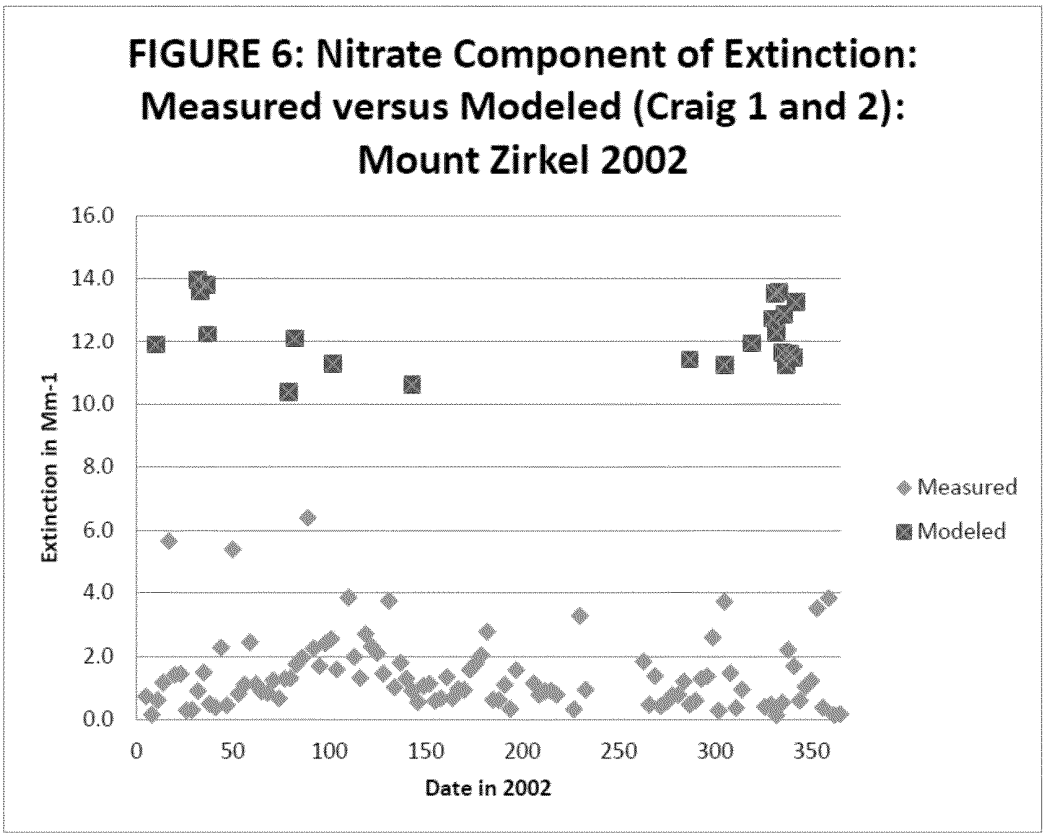
Comment: [PacifiCorp -- Hoffnagle Report, p. 9] AQMG has proposed that CALPUFF be removed from the Guideline as a preferred model for Long Range Transport (80 FR 45339 on July 29, 2015). While the preamble suggests that CALPUFF 5.8.4 can still be used for BART determinations, it is expected that AQMG and IWAQM will adopt some other model for long range transport in the near future. Again, AQMG has not analyzed any of the newer versions of CALPUFF.

Response: We acknowledge the background information submitted by the commenter. Our use of the current EPA-approved version of CALPUFF (Version 5.8.4, Level 130731) is described elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, pp. 9-10] The margin of error is also affected by the atmospheric chemistry which occurs along the path to the Class I area. As an example of the errors being compounded by this atmospheric chemistry portion of the model, I performed and presented to the State of Colorado a comparison of the measured versus modeled nitrate component of the deciview impact from the Craig Station some 98 kilometers to the Mount Zirkel Wilderness Area. Figure 6 shows the nitrate portion of the measured and modeled deciview CALPUFF calculations. These represent comparisons of the daily nitrate concentration

[513] Comparison of Single-Source Air Quality Assessment Techniques for Ozone, PM2.5, other Criteria Pollutants and AQRVs, ENVIRON, September 2012.

measured at the Mount Zirkel Wilderness Area to the CALPUFF modeled daily concentration of nitrate particles at that measurement location. Of course, the measured concentrations are from all sources not just the Craig Station and the margin of error is underestimated because of this. This represents a margin of error of at least 1,000% in calculating nitrate contribution to visibility impairment. This is a clear indication that the margin of error increases substantially when the atmospheric chemistry part of the calculation is included. Also note that the modeled nitrates occur in winter when the temperatures favor nitrate formation and not in the summer when temperatures are too hot for nitrate formation.



Response: We acknowledge the background information submitted by the commenter. The goal of CALPUFF modeling is to estimate the anticipated visibility impact from the source on all Class I areas that the source affects, and not to provide an estimate of visibility conditions for a specific place at a specific time. Indeed, CALPUFF modeling estimates visibility impacts at receptors located throughout a Class I area, while the monitor, used in the commenter's example, only measured visibility conditions at one site.

With respect to Figure 6 (above) presented by the commenter, the values used in the comparison of modeled vs. monitored impact do not represent the impact from the source alone. Rather, as

the commenter correctly states, the data presented compare the total impact, which includes an estimate of background visibility, rather than the impact from the source alone, to the measured impairment. When this estimated background extinction is eliminated from the comparison, the measured visibility impairment on 15 of the 19 evaluated days is larger than the extinction from this source alone, contrary to the claims of the commenter. If the analysis is limited to those specific days where appreciable visibility impairment is measured (impairment greater than the 12.2 Mm-1 natural background level) the average modeled visibility impairment is less than half the average observed impairment due to particulates. In addition, we have reviewed the data presented in the reports related to this comment and have determined that the reported overprediction of nitrate of 9.56 Mm-1 was also arrived at in error and is greatly overstated. The commenter incorrectly calculated the total extinction and nitrate extinction based on the delta deciview value rather than calculating the difference in extinction between the total and background extinction. The deciview is a logarithmic function of extinction, therefore the change in extinction that results in a certain delta deciview is dependent on where on the deciview scale you are. A delta deciview of 2 dv in near pristine conditions would be a much smaller change in extinction than a delta deciview of 2 dv in degraded conditions.

EPA's modeling in this action was consistent with the BART Guidelines, which recommend the use of CALPUFF to evaluate the expected visibility improvements from the potential BART control technology applied to the source. 40 CFR part 51, appendix Y, section IV.D.5. In recommending the use of CALPUFF, EPA recognized that the model had certain limitations but concluded that "[f]or purposes of the RHR's BART provisions, CALPUFF is sufficiently reliable to inform the decision making process, e.g., see 70 FR 39123. We also addressed concerns with CALPUFF's treatment of chemical transformations by recommending that states use the 98th percentile of modeled visibility impacts, 70 FR 39121, an approach that EPA followed here, to address the possibility that the model could overestimate impacts. EPA's discussion of CALPUFF in the final BART Guidelines rule addresses these issues at length. 70 FR 39121-29124. To the extent that the comment takes issue with the provisions in the BART Guidelines for use of CALPUFF, the legal deadline for challenging EPA's recommendation to use CALPUFF in BART analyses has passed.

We also note that in 2015, the EPA proposed revisions to 40 CFR Part 51 Appendix W, Guideline on Air Quality Models ("Guideline"), but these proposed changes to the Guideline do not affect our recommendation in the 2005 BART Guidelines to use CALPUFF in the BART determination process. 80 FR 45340, 45350 (July 29, 2015). As explained in the preamble to the proposed Guideline revisions:

> Given that the overwhelming majority of BART determinations have been made using CALPUFF, we consider it appropriate for states (or the EPA) to continue to use this application for the remaining assessments under the current Guideline with approved protocols. This approach assures consistency across and within states in the regional haze program.

Id. We continue to believe it is appropriate to use CALPUFF to make BART determinations in order to provide a fair "apples-to-apples" comparison of expected improvements in visibility between prior and current BART determinations. Our response to the "margin of error" for CALPUFF is provided elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, p. 10] A similar analysis for Utah could be accomplished if daily measurements from the Parks and daily model results from EPA's CALPUFF modeling were available. The analysis can be approached by looking at the nitrate component of the measured visibility data at the Parks from the IMPROVE sampling program to determine how much is nitrates. Table 2 shows the nitrate component of the data from the three Utah Parks with IMPROVE measurement locations. These data are found in Table 3.1 and 3.2 of the Utah DAQ Progress Report of September 23, 2014. The data are for the period 2005-2009 before most of the changes in the power plant sources.

Table 2: Ammonium Nitrate Reductions in Utah

	deciviews	Minus Rayleigh	% Nitrates	Deciviews From Nitrates*	
Bryce Canyon	2.1	0.61	15%	0.09	
Canyonlands	2.8	0.98	12%	0.12	
Capitol Reef	2.7	0.95	13%	0.12	
20% Most Impaired days				Modeled Benefit from SCR	
	deciviews	Minus Rayleigh	% Nitrates	Deciviews From Nitrates*	EPA 98%
Bryce Canyon	11.9	9.04	9%	0.81	0.329
Canyonlands	11.0	8.14	14%	1.14	1.441
Capitol Reef	11.3	8.36	12%	1.00	1.037

*All sources contribute to the measured nitrates

Response: We acknowledge the background information presented by the commenter. As the commenter correctly asserts, CALPUFF was not used to model visibility on the 20% worst days or the 20% best days. Rather, CALPUFF modeling following the BART Guidelines approach is used to provide estimates of the maximum visibility impacts from a source based on maximum emissions and simplified chemistry, against natural background conditions, irrespective of the relationship to the monitored 20% worst (or best) days.

The CALPUFF visibility analysis performed for each of the sources in this action modeled a period of three years and utilized a constant emission rate (the baseline emission rates represent the 24-hour average actual emission rate from the highest emitting day of the meteorological period modeled and the control-level emission rates represent a percentage of the baseline emission rates), hourly averaged ozone data, monthly averaged relative humidity adjustment factors, a constant background ammonia and a correction to account for ammonia-limiting

conditions. Modeling of a three year period allows for consideration of climatological worst case conditions. The goal of this modeling is to estimate the maximum anticipated impact from the source against natural background conditions.

We also note that the monitoring data provided by the commenter reflect existing conditions at the affected Class I areas. As explained elsewhere in this document, CALPUFF modeling performed in accordance with the BART Guidelines is not intended to predict the amount of visibility improvement that will occur under existing conditions. Rather, this modeling is intended to estimate how much visibility improvement would occur under natural visibility conditions. The importance of this distinction and the rationale for using natural conditions as the baseline for CALPUFF modeling is explained in the preamble to the final rule that established the BART Guidelines:

> Using existing conditions as the baseline for single source visibility impact determinations would create the following paradox: the dirtier the existing air, the less likely it would be that any control is required. This is true because of the nonlinear nature of visibility impairment. In other words, as a Class I area becomes more polluted, any individual source's contribution to changes in impairment becomes geometrically less. Therefore the more polluted the Class I area would become, the less control would seem to be needed from an individual source. … Such a reading would render the visibility provisions meaningless, as EPA and the States would be prevented from assuring "reasonable progress" and fulfilling the statutorily-defined goals of the visibility program.[514]

Thus, the monitoring data supplied by the commenter are not directly relevant to assessing visibility impacts and potential benefits in the context of a BART analysis.

Comment: [PacifiCorp -- Hoffnagle Report, p. 11] EPA's CALPUFF modeling using the 98% test shows visibility improvements from SCRs at the four Utah BART-eligible units greater than visibility impairment from nitrates from all sources, which is an impossibility. The SCRs cannot improve visibility greater than the impairment caused by nitrates from all sources. The four Utah BART-eligible units emit just a fraction of the total nitrates that impact the Parks, so they cannot improve nitrate-related visibility beyond their relative contribution. The data imply that the CALPUFF v. 5.8.4 model is vastly over predicting the reduction in nitrates that is possible at the Parks. Unfortunately we cannot derive a margin of error from these comparisons for the Utah Parks.

Response: This comment refers to the Utah's assessment of the 20% worst visibility days using IMPROVE data from 2005-2009. The commenter estimates the nitrate contribution on these days and compares it to the EPA CALPUFF visibility improvement on the 98th percentile day, so this is not a valid comparison. However, as noted in the previous response, we have not compared CALPUFF nitrate predictions to IMPROVE data at these Class I areas.

[514] 70 FR 39124 (July 6, 2005).

Comment: [PacifiCorp -- Hoffnagle Report, p. 12] While there are many conservatisms in EPA's CALPUFF model methodology that EPA imposes on the BART modeling which materially skews the results, there are two that are major factors. The first is EPA's insistence that a uniform background concentration of ammonia be used year round. The atmospheric chemistry is described simply as the chemical transformation of nitrogen dioxide and sulfur dioxide, which are gases, to ammonium nitrate and ammonium sulfate. The sulfate and nitrate are very small particles which are visible and thus contribute to visibility degradation downwind. In this case, the State of Utah has measurements of ambient ammonia that apply to the model analysis, but that EPA did not use (see Figure 7). It is unscientific and not supportable to ignore these data. This is especially true because the data clearly show that ammonia concentrations in the winter months are quite low and are higher in the summer months. This means that exactly when nitrates are expected to form, in the colder months, there is much less (10-50% of the 1 ppb used in the modeling) ammonia available. As can be seen in the Zirkel data above, that is when nitrates form. This wintertime deficit of ammonia is exactly why the EPA annual average ammonia background is bad science. It also should be taken into consideration that the sulfur and nitrogen compete for the available ammonia and in fact the sulfur wins especially during the summer. It is better to control sulfur than nitrogen. See Figure 8. These data lead me to conclude that spending millions of dollars on control of nitrogen dioxide emissions will not result in any improvement at all in visibility at the Class I areas. The modeling that EPA used is not reliable, its margin of error is more than a factor of 10 and it is bad science.

Response: Our responses to ammonia background within our CALPUFF model analysis, the commenter's "margin of error" assertions, and the significance of nitrate and sulfate contributions to light extinction are found elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, p. 12] What is particularly unscientific about EPA's insistence to use an annual average ammonium background concentration is EPA's required use of monthly average relative humidity and hourly average ozone concentration data. It seems then quite arbitrary to require an annual average for ammonia when actual daily average ammonia data is available. EPA's argument has been that the ammonia concentrations are at the Park and not along the plume path, but so are the relative humidity and ozone concentrations which are all important in the atmospheric chemistry.

Response: EPA Region 8 continued to rely on the background ammonia concentration assumptions used by UDAQ. UDAQ used the IWAQM default background ammonia value for arid areas, which for this area is a constant 1 ppb for all months and sources. Monthly and hourly averaged relative humidity adjustment factors and ozone, respectively, were assumed in the modeling because of the data and information being the most representative for the area. In particular, the monthly averaged relative humidity adjustment factors have been quality assured and recommended by the Federal Land Managers for use in visibility modeling. However, the EPA did not update the background ammonia assumptions because representative ammonia data for this area currently does not exist. Refer to our response regarding background ammonia elsewhere in this document.

Comment: [PacifiCorp p. 50] *EPA's background ammonia concentration used in its CALPUFF modeling skews EPA's BART visibility improvement analyses.* Regional haze modeling – and the resulting predicted visibility improvement – is greatly influenced by the background ammonia number used in the model.[515] See Hoffnagle Report at 12. EPA improperly used a constant 1 ppb background ammonia number for its CALPUFF modeling for the Utah BART Units,[516] which greatly overestimated the "reasonably anticipated" visibility improvements from SCR. Id. EPA should have used available ammonia monitoring data in its modeling. EPA's failure to use this ammonia monitoring data "is unscientific and not supportable." Hoffnagle Report at 12.
In fact, instead of the constant 1 ppb ammonia number used by EPA, which Mr. Hoffnagle describes as "bad science" due to its failure to account for low winter ammonia levels, the "best" science requires the use of "variable ammonia" background numbers. Id. Given its geographic location and elevation levels, Utah undergoes seasonal swings of dry-hot summers (with higher ammonia levels) and snow-covered ground in the winter (with lower ammonia levels). Id.

Therefore, the use of a single ammonia concentration for the entire year in a state where the land use and land cover changes significantly between seasons results in the overestimation of visibility improvements. (See e.g., July 2, 2010 letter and attachment from Tri-State Generation to Colorado Air Pollution Control Division, discussing Mt. Zirkel area, Attachment 8) "This means that exactly when nitrates are expected to form, in the colder months, there is much less (10-50% of the 1 ppb used in the modeling) ammonia available. . . . This wintertime deficit of ammonia is exactly why the EPA annual average ammonia background is bad science. It should be taken into consideration that the sulfur and nitrogen compete for the available ammonia, and in fact the sulfur wins especially during the summer." Hoffnagle Report at 12. EPA should have used the available background ammonia information, such as the information represented in the graphs on page 13 of the Hoffnagle Report, to run the CALPUFF model to determine the true impact of EPA's FIP Proposal.

Moreover, EPA has approved the use of variable gaseous ammonia concentrations in CALPUFF modeling before, including the Addendum to Modeling Protocol for the Proposed Desert Rock Generating Station (ENSR, 2006).

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[515] Sensitivity tests on ambient ammonia concentrations were performed by the Colorado Department of Public Health and Environment for an area in northwest Colorado. See Attachment 8. The analysis demonstrated that visibility calculations performed at Mount Zirkel Wilderness Area in northwest Colorado had limited impact when ambient ammonia concentrations were reduced from 100 to 1 ppb, but there was a significant reduction in visibility impacts when concentrations were further reduced to 0.1 ppb. Given the evidence presented above, the use of the monthly varying ammonia would provide much more accurate estimates of visibility impacts from the Utah BART Units. EPA's failure to use the "best science," variable background ammonia in its modeling, is arbitrary and capricious.

[516] EPA's refusal to use a "variable ammonia" number in its CALPUFF modeling for the FIP Proposal is very curious given EPA's "required use of monthly average relative humidity and hourly average ozone concentration data" in its model. See Hoffnagle Report at 12. The arguments EPA has used to justify a static, annual average for background ammonia apply with equal force to relative humidity and ozone. Id.

(http://www.epa.gov/region9/air/permit/desertrock/administrative.html). EPA Region 8 admitted the validity of using "variable ammonia" for CALPUFF modeling in its federal implementation plan for Montana, where EPA used "variable ammonia" in its CALPUFF modeling. 77 FR at 57867. ("As a result, we did not assume a constant level of ammonia as asserted by the commenter, and we did represent seasonal variability in ammonia concentrations. Additionally, EPA used the POSTUTIL program" with the Ammonia Limiting Method (ALM) to post-process the CALPUFF output to correct the assumption of constant ammonia availability in the model."). EPA also applied "variable ammonia" amounts when analyzing regional haze and BART issues in Wyoming. EPA Region 8 evaluated background ammonia concentrations for Wyoming in the updated CALPUFF modeling as a result of comments received on EPA Region 8's revised proposal published in June 2013. 79 FR at 5032, 5111. EPA admitted in Wyoming that an "accurate specification" of background ammonia is "critical to the accurate estimation of particulate nitrate concentrations." Id. at 5112. EPA also suggested that an "overestimate [of] the regional background concentration" would also result in the "overestimate [of] the visibility benefit due to NO[x] reductions." Id. at 5113. In fact, EPA claimed in Wyoming that the "*use of more realistic ammonia background concentrations*, the ammonia limiting correction, and the use of the 98th percentile modeled impact address the concern that the CALPUFF model could overestimate visibility impacts." Id. at 5,117.

Given EPA's recognition of the need to properly represent seasonally-variable background ammonia levels in CALPUFF modeling for sources in Wyoming, Montana, and Arizona, EPA should do the same here. In particular, where EPA relies on BART comparisons from power plants in Wyoming and Arizona to justify its FIP Proposal, EPA must ensure the CALPUFF visibility modeling (including the associated impacts of background ammonia) supporting EPA's FIP Proposal is similar to that done in Wyoming and Arizona. Moreover, EPA's failure to use seasonally-variable background ammonia levels in its CALPUFF modeling to support its FIP Proposal skews the results of EPA's BART visibility improvement analyses. EPA's inconsistent actions in this regard are arbitrary and capricious.

Figure 7: Ammonia Concentrations at Navaho Lake (blue) and Canyonlands (red) Green Line is BART Guidance Assumption

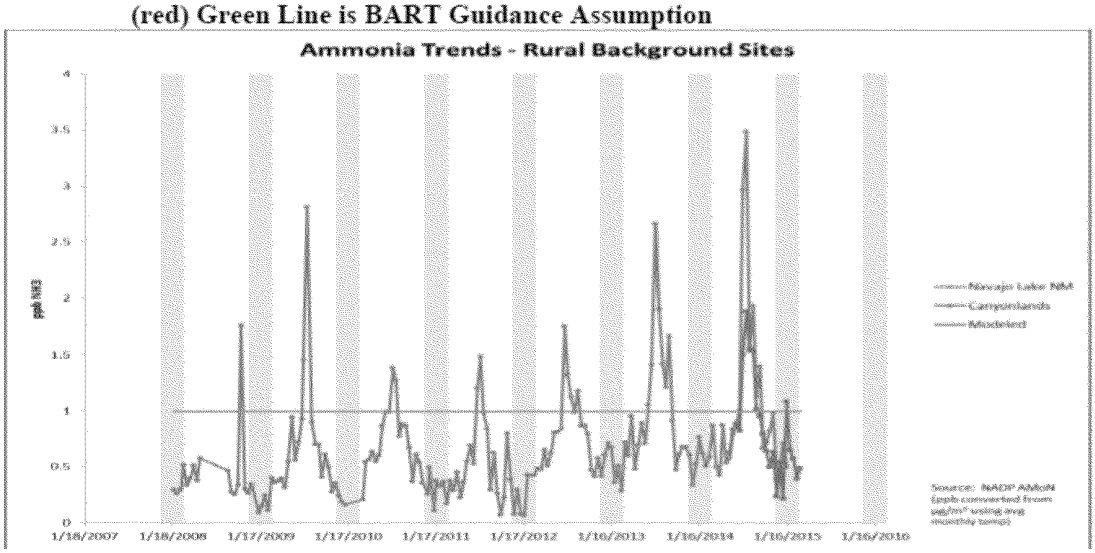
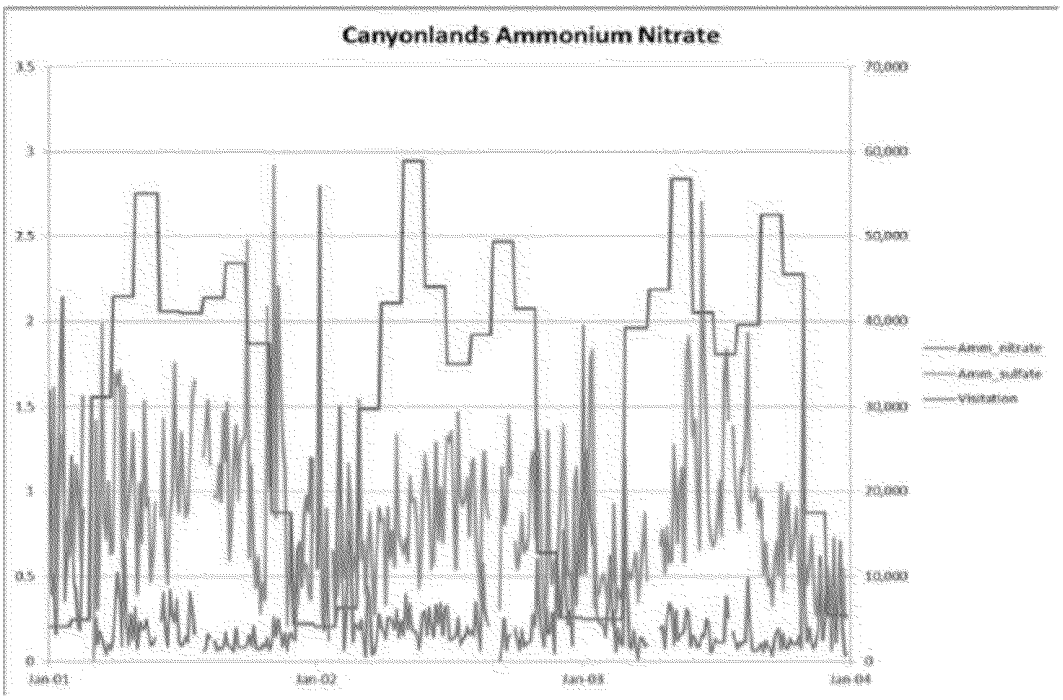


Figure 8: Ammonium Nitrate by Season at Canyonlands (Blue Line)



Source: UDAQ Review of Bart Determination, February 13, 2015

Response: The IWAQM Guidance[517] is the only guidance available for choosing ammonia background concentrations. Because of the paucity of monitoring data in this case and the uncertainty in other ammonia estimation methods, EPA concludes that it is appropriate to use the default 1 ppb from the IWAQM Guidance.

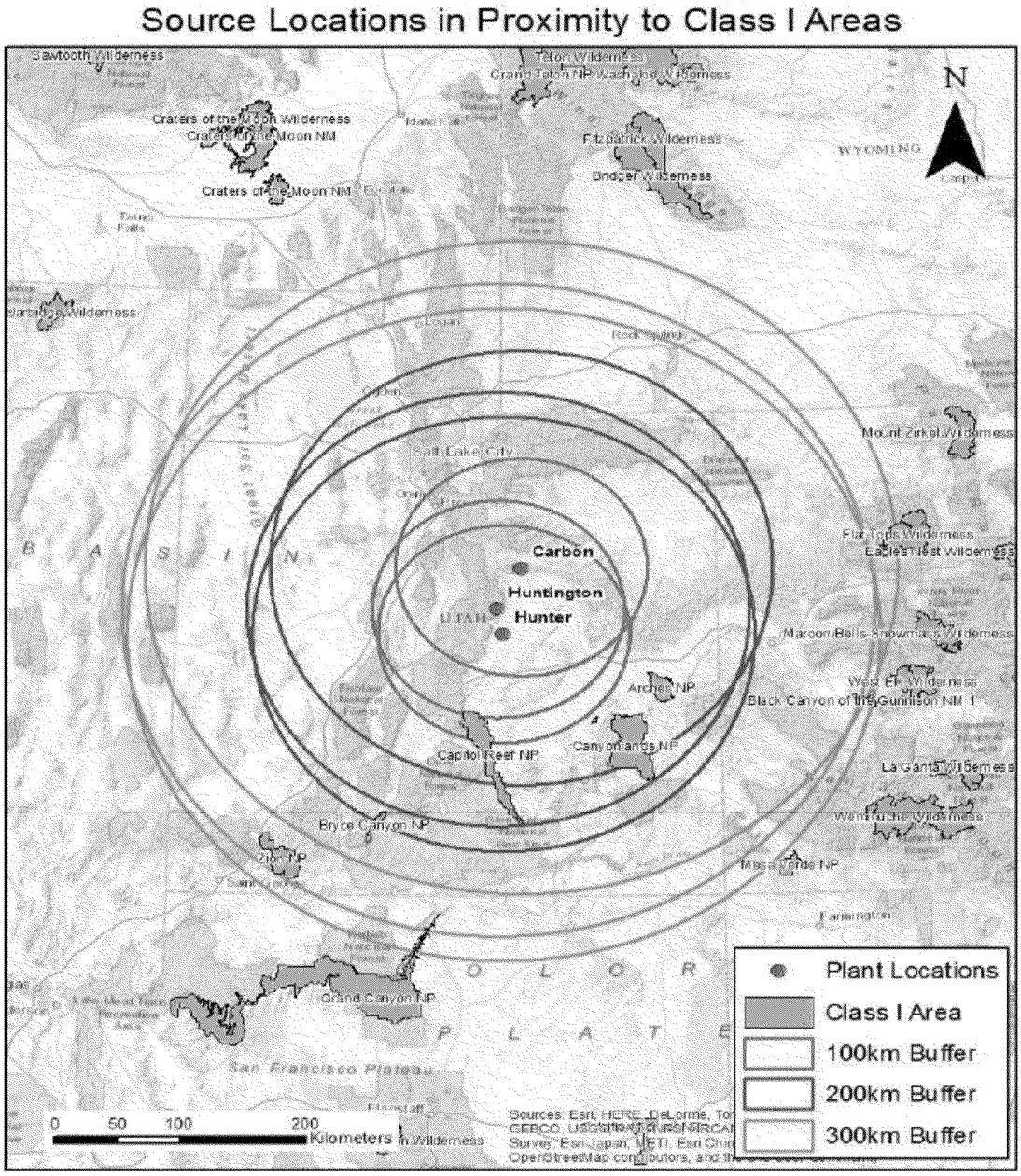
EPA agrees with the commenter that it would be preferable to use actual monitoring data to determine background ammonia concentrations. However, the dataset for Utah is so sparse, it is difficult to determine the appropriate levels that should be used. The commenter asserts that EPA should use the ammonia information in the graphs copied here for monitoring sites at Navajo Lake and Canyonlands. The Navajo Lake site in New Mexico is about 250 miles from the PacifiCorp EGUs and is too far away to provide representative data. For the Canyonlands site, Utah Department of Air Quality began monitoring ammonia there in May 2014 to gain a better understanding of background ammonia levels. The dataset for Canyonlands is too sparse to provide conclusive variable ammonia concentrations for modeling purposes (we include additional discussion regarding the ambient monitoring data at Canyonlands and commenters' assertions that nitrate concentrations are ammonia limited in other responses elsewhere in this document). The only other monitoring sites in Utah are affected by urban emissions or agriculture.

The commenter discusses other EPA actions in Wyoming, Montana and Arizona where variable ammonia concentrations were used in CALPUFF modeling. In these three instances, sufficient monitoring data were available to justify this approach. For the modeling the Utah EGUs, EPA concludes that there is not a compelling case for using ammonia background concentrations other than the 1 ppb found in the only authoritative guidance document available on this topic.

Comment: [PacifiCorp -- Hoffnagle Report, pp. 12-15] The second major error is for EPA to assume, without proof, that the CALPUFF modeling system can calculate reliable concentrations out to 300 kilometers. EPA insists that every Class I area within 300 kilometers be included in the analysis. As shown above the CALPUFF model is not demonstrably valid beyond 100 kilometers and we can judge its margin of error at that distance but not beyond. EPA insists that we look at CALPUFF results out to 300 kilometers includes 9 Class I Areas. Figure 9 shows the distances on a map and Table 3 details the distances.

[517] US EPA OAQPS, *Interagency Workgroup On Air Quality Modeling (IWAQM) Phase 2 Summary Report And Recommendations For Modeling Long Range Transport Impacts,* EPA-454/R-98-019, (December 1998), available at http://www.epa.gov/scram001/7thconf/calpuff/phase2.pdf.

Figure 9: Class I Area Distances



Source: TRC

Table 3: Distance to Class I Areas

	Hunter Plant	Huntington Plant	Carbon Plant
Capitol Reef National Park	75	96	139
Arches National Park	120	132	139
Canyonlands National Park	115	134	154
Bryce Canyon National Park	188	206	249
Zion National Park	259	274	316
Grand Canyon National Park	262	283	325
Black Canyon of the Gunnison	284	293	289
Mesa Verde National Park	305	321	339
Flat Tops Wilderness Area	310	309	286

In the Acceptable Range
Beyond even the EPA Criteria

Only the first three Parks are within a distance where we can rely upon the results for gaseous concentrations to be within a distance range where we know the margin of error.

Response: The CALPUFF model is generally intended for use on scales from 50 km to several hundred kilometers (2005 BART Guidelines at 70 FR 39122). As also stated in the BART Guidelines, if states are concerned about potential overpredictions at large distances, they can make judgements concerning the conservativeness or overestimation, if any, of the results.

The Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 report (EPA, 1998) [518] reviewed model performance evaluations of CALPUFF as a function of distance from the source and concluded that:

> Based on the tracer comparison results presented in Section 4.6, it appears that CALPUFF provides reasonable correspondence with observations for transport distances of over 100 km. Most of these comparisons involved concentration values averaged over 5 to 12 hours. The CAPTEX comparisons , which involved comparisons at receptors that were 300 km to 1000 km from the release, suggest that CALPUFF can overestimate surface concentrations by a factor of 3 to 4. Use of the puff splitting option in CALPUFF might have improved these comparisons, but there are serious conceptual concerns with the use of puff dispersion for very long-range transport (300 km and beyond). As the puffs enlarge due to dispersion,

[518] US EPA Research Triangle Park, NC, Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Report and Recommendations for Long-Range Transport Impacts ("IWAQM Phase II Report"), EPA-454/R-98-019, p. 18 (1998).

> it becomes problematic to characterize the transport by a single wind vector, as significant wind direction shear may well exist over the puff dimensions. With the above thoughts in mind, IWAQM recommends use of CALPUFF for transport distances of order 200 km and less. Use of CALPUFF for characterizing transport beyond 200 to 300 km should be done cautiously with an awareness of the likely problems involved.

Therefore, given that the IWAQM guidance provides for the use of the CALPUFF model at receptor distances of up to 200 to 300 km (and 339 km is reasonably close to 300 km), there is no reason to believe that the results are not usable at a distance of slightly greater than 300 km, heeding all of the noted caveats in the above references. Indeed, our 2012 report "Documentation of the Evaluation of CALPUFF and Other Long Range Transport Models Using Tracer Field Experiment Data"[519] found that while there are spatial differences between the CALPUFF and CAMx models for nitrate and sulfate, the results are similar and do not lead us to believe that CALPUFF cannot predict visibility impacts at distances beyond 300 km.. For our BART analysis, CALPUFF is suitable to show, as we did, that the sources are reasonably anticipated to impact the Class I areas and NO_x controls will help eliminate the visibility impacts.

Comment: [PacifiCorp -- Hoffnagle Report, pp. 15-16] EPA chose to model only the individual BART-eligible units to show what the effect of that unit would be on visibility (through modeled deciview improvements) at the Class I Areas. EPA's method showed that each BART eligible unit results in nearly the same effect on visibility. However, EPA never ran all four units together, nor did EPA run two units with the full NO_x controls at the same plant together. They did run a unit at base case emissions with a unit on full NO_x controls at the same plant, but that is not a reasonable run because EPA wants all units to be on full NO_x controls. Because the atmospheric chemistry is not linear, the sources should be run together at the scenario proscribed. When all the plants are run together the model would show a far smaller deciview impact than any additive result of running them separately. Each plume competes for the relatively small amount of ammonia assumed in the model. Once the ammonia is gone no more nitrate can be produced. For both single unit CALPUFF runs at Hunter, EPA also included Hunter 3 at the base case emissions but not at the alternative case emissions. This skews the analysis in favor of more visibility improvement for the single unit SCR. EPA's CALPUFF model runs also never include the Carbon Plant and thus miss the reductions in nitrate and, more importantly, sulfate that occur because of those reductions, again skewing the results in favor of SCR.

Response: The commenter appears to have misinterpreted the approach used in EPA modeling. As described in our modeling protocol and elsewhere in this document, as our modeling protocol clearly states, the model results for each unit and scenario were then combined using POSTUTIL to account for the effects of multiple units in ammonia-limited conditions. Our response

[519] "Documentation of the Evaluation of CALPUFF and Other Long Range Transport Models Using Tracer Field Experiment Data", EPA-454/R-12-003 (Environ Report). May 2012.

regarding the inclusion of the Carbon Plant in our BART FIP modeling is provided elsewhere in this document.

Comment: [PacifiCorp -- Hoffnagle Report, p. 16] For some unknown reason, not cited in the EPA modeling protocol, EPA reduces to nearly zero the direct (stack emission) sulfates and particulate matter from all four units they slate for SCR. The Utah model results do not make these reductions. This difference enhances the decrease in deciviews from EPA's model runs attributed to the use of SCR perhaps to a significant extent. Additionally, EPA's CALPUFF model runs make similar reductions for sulfates and particulate matter as well as NO_x emissions at Hunter Unit #3 which are not reflected in the EPA protocol and also enhances the decrease the deciviews attributed to SCR in EPA's CALPUFF model runs. The changes in emissions, not revealed in the proposal, are reason to call EPA's benefits from SCR into question.

Response: Our response regarding our emissions assumptions for modeling is found elsewhere in the document.

Comment: [PacifiCorp -- Hoffnagle Report, p. 16] The EPA CALPUFF modeling results can be evaluated in the same way. These results are presented in Table 6 and show the effect of applying the transport and diffusion margin of error. Only the results for Unit 1 at each plant are shown because the evaluation for Unit 2 would be nearly identical. They do not include the error due to atmospheric chemistry which may be as high as a factor of 10 over prediction. They also do not include the errors introduced by running units by separately or emissions.

Table 6 : Apply Transport and Diffusion Margin of Error to EPA Results

All Results In Deciviews						
	EPA Results			Include Margin of Error		
	Alternative	Add SCR	SCR - Alternative Visibility Improvement	Alternative	Add SCR	SCR - Alternative Visibility Improvement
Hunter 1						
Capitol Reef	4.61	3.49	1.11	2.71	2.05	0.65
Arches	4.60	3.26	1.34	2.71	1.92	0.79
Canyonlands	5.36	3.81	1.55	3.15	2.24	0.91
Huntington 1						
Capitol Reef	3.39	2.28	1.11	1.44	1.15	0.29
Arches	3.89	2.40	1.49	1.69	1.37	0.32
Canyonlands	5.13	3.25	1.88	1.92	1.56	0.36

Response: Our response to the inclusion of a calculated transport and diffusion "margin of error" is found elsewhere in the document.

Comment: [PacifiCorp, p. 46] *EPA failed to consider the limitations of the CALPUFF model.* In conducting its BART visibility improvement analyses for the Utah BART Units in the FIP Proposal, EPA treats the relative small CALPUFF modeled visibility improvements as concrete and unassailable. See e.g., 81 FR at 2035 tbl. 15; at 2036 tbls. 16, 17, and 18; at 2037 (for the Hunter 1 Unit).[520] EPA relies solely on CALPUFF modeled visibility improvements as the basis for its visibility improvement analyses in the FIP Proposal. See, e.g., 81 FR at 2037. However, EPA's BART visibility analyses in the FIP Proposal fail to recognize the known and documented limitations on the CALPUFF model. Rather, EPA treats the results from the CALPUFF visibility modeling as being capable of accurately predicting visibility improvements down to the tenths or hundredths of a deciview (when one deciview is considered what is humanly perceptible). As applied by EPA here, the CALPUFF model is not that accurate. Also, EPA assumes that a CALPUFF modeled difference of 0.1, 0.2, an even 0.9, deciviews is material in the FIP Proposal. Given the applicable margins of error, it is not. The reality is that computer models predicting visibility impacts from a given source, including CALPUFF, are relatively imprecise and easily influenced by the choice of inputs and parameters.

a. CALPUFF is woefully imprecise. Gale F. Hoffnagle, an expert air quality modeler at TRC Environmental Consultants,[521] summarizes in his report, attached as Attachment 3, the limitations of the CALPUFF model.[522] Mr. Hoffnagle's Report states that the studies EPA relied upon to support the use of CALPUFF (v. 5.8) model for regional haze purposes demonstrate that the CALPUFF results (at 100km) were "35%, 5%, or 250% too high, average 96% too high and has a mean error rate of 96%." See Hoffnagle Report at 6. In other words, some of the studies EPA relied on to justify the use of the CALPUFF v. 5.8 model show CALPUFF grossly overstates visibility improvements. Mr. Hoffnagle further explains that two other studies (Savannah River and Great Plains) used by EPA to justify the use of the CALPUFF v 5.8 model show that "there is an error rate of 79% and always greater than the measured concentration." Id. at 7. "The 'margin of error' identified in the aforementioned studies is hereafter referred to as the 'transport/diffusion margin of error' because these studies measured CALPUFF v. 5.8's accuracy relative to long-range transport and diffusion." Id. Additional studies and reports have also raised questions about the transport/diffusion margin of error for CALPUFF, and a review of all the

[520] EPA treats the CALPUFF modeled visibility improvement results as concrete and unassailable for all the Utah BART Units, and the arguments herein regarding EPA's visibility improvement analyses apply to all of the Utah BART Units.

[521] Mr. Hoffnagle's curriculum vitae is attached as Attachment 6.

[522] Mr. Hoffnagle is a CALPUFF modeling expert. His CALPUFF "margin of error" report was part of the information that the Ninth Circuit Court of Appeals found EPA should have considered and accounted for in Nat'l Parks. In that case, the court stated "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 had 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." Nat'l Parks Conservation Ass'n v. E.P.A., 788 F.3d 1134, 1147 (9th Cir. 2015).

studies together by Environ suggests the transport/diffusion margin of error "for CALPUFF version 5.8 is around 70% for the maximum observed concentration with many signals that the error is higher. The error is always on the high side and we can say little about the margin of error beyond 100 kilometers." Hoffnagle Report at 8-9. Clearly, EPA cannot, as it did in its FIP Proposal, simply rely on CALPUFF's excessively high, modeled results in light of the transport/diffusion margin of error. Instead, EPA should have made appropriate adjustments in its analysis of the CALPUFF modeled results to account for the transport/diffusion margin of error so that EPA "reasonably anticipates" any visibility improvements associated with EPA's proposed NO_x BART determinations. 42 U.S.C. § 7491(g)(2); Nat'l Parks Conservation Ass'n, 788 F.3d at 1147. EPA did not do so here.

b. EPA did not account for "atmospheric chemistry margin of error". CALPUFF also has severe limitations in modeling the atmospheric chemical changes that are necessary for NO_x to become a visibility-impairing particulate. As Mr. Hoffnagle's Report explains, the "margin of error is also affected by the atmospheric chemistry which occurs along the path to the Class I area." See Hoffnagle Report at 9. As an expert in this area, Mr. Hoffnagle has previously "performed and presented to the State of Colorado a comparison of the measured versus modeled nitrate component of the deciview impact from the Craig Station some 98 kilometers to the Mount Zirkel Wilderness Area." Id. Mr. Hoffnagle compared "the daily nitrate concentration measured at the Mount Zirkel Wilderness Area to the CALPUFF modeled daily concentration of nitrate particles at that measurement location." Id. As a result of this study, Mr. Hoffnagle concluded that CALPUFF's atmospheric chemistry margin of error in that study was "at least 1,000% in calculating nitrate contribution to visibility impairment. This is a clear indication that the margin of error increases substantially when the atmospheric chemistry part of the calculation is included." Hoffnagle Report at 10. Again, EPA's FIP Proposal failed to account for either the transport/diffusion margin of error or the atmospheric chemistry margin of error, and EPA blindly relies on overstated CALPUFF modeling results without any adjustments for model inaccuracies. As a result, EPA's FIP Proposal is unsupportable and should be withdrawn. See Nat'l Parks Conservation Ass'n, 788 F.3d at 1147.

c. The transport/diffusion and atmospheric chemistry margins of error materially change EPA's visibility analyses. When the appropriate "margins of error" are applied to EPA's CALPUFF modeling results in the FIP Proposal, the alleged "substantial visibility benefits" (81 FR at 2038) EPA relied on to justify its FIP Proposal disappear. For example, EPA's CALPUFF modeled visibility improvement results related to the installation of LNB/OFA/SCR (EPA's NO_x BART determination) at Hunter Unit 1 indicate a 1.34 dv improvement at Arches, 1.55 dv improvement at Canyonlands, and a 1.11 dv improvement at Capitol Reef. See 81 FR 2 035, tbl 15. These results lead EPA to conclude the comparisons "show that costs are justified in light of the substantial visibility benefits." Id. at 2038. However, these "substantial visibility benefits" disappear when the proper "margins of error" are applied. In Mr. Hoffnagle's Report, after applying the transport/diffusion margin of error and the atmospheric chemistry margin of error, the CALPUFF modeled visibility improvements shrink to an inconsequential 0.16 dv for Arches, 0.18 dv for Canyonlands, and 0.16 dv for Capitol Reef. See Hoffnagle Report at 19, tbl 8. Likewise, EPA's CALPUFF modeled visibility improvement results related to the installation of

LNB/OFA/SCR (EPA's NO_x BART determination) for Huntington Unit 1 indicate a 1.49 dv improvement at Arches, 1.88 dv improvement at Canyonlands, and a 1.11 dv improvement at Capitol Reef. See 81 FR 2043, tbl. 27. In Mr. Hoffnagle's Report, after applying the transport/diffusion margin of error and the atmospheric chemistry margin of error, the visibility improvements shrink to an inconsequential 0.15 dv for Arches, 0.19 dv for Canyonlands, and 0.12 dv for Capitol Reef. See Hoffnagle Report at 19, tbl 9. Clearly, these miniscule visibility improvements would not justify the tremendous costs imposed by EPA's FIP Proposal. EPA's FIP Proposal is flawed and unsupportable because it failed to consider the CALPUFF modeled visibility improvement results in light of the proper margins of error, which drastically affect the results.[523] At least one federal court has rejected an EPA regional haze FIP because EPA failed to account for the CALPUFF model's limitations (specifically the margin of error) when EPA formulated its BART determinations. Nat'l Parks Conservation Ass'n v. E.P.A., 788 F.3d 1134, 1147 (9th Cir. 2015). Therefore, EPA's FIP Proposal should be withdrawn.

Response: Our responses regarding the magnitude of visibility improvement and the commenter's atmospheric and transport and diffusion "margins of error" are provided elsewhere in this document.

Comment: [PacifiCorp, p. 46] *d. EPA should have used the improved CALPUFF version.* CALPUFF version 5.8.4, used by EPA to support its FIP Proposal, is not the latest and most accurate version of CALPUFF. As Mr. Hoffnagle explains, the owners of CALPUFF "have prepared more advanced versions of CALPUFF that have not been adopted by EPA. The focus of these advancements have been in providing better atmospheric chemistry based on twenty years of advancement in atmospheric chemistry science. AQMG [EPA] has steadfastly refused to give anything more than acknowledgement to these advancements and yet continuously criticizes CALPUFF for not having advanced chemistry." See Hoffnagle Report at 7.

Air modeling experts have determined that CALPUFF version 6.42, with a variable ammonia background setting, updated chemistry module, and Method 8 of CALPOST is the "best" science when it comes to modeling for regional haze. CALPUFF Version 6.42 produces more realistic and accurate results. *See* Paine, B, Connors, J, "Response to Prehearing Statements: Martin Drake Power Plant Best Available Retrofit Technology Rulemaking Hearing," November 20, 2010, attached as Attachment 7. Version 6.42 contains needed refinements, such as a better "chemistry" module known as ISORROPIA (Version 2.1). Id. Additionally, CALPUFF Version 6.42 has been maintained by TRC and has had many bug fixes and enhancements not included in CALPUFF Version 5.8.4. Id.

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[523] Additionally, the monitored data demonstrates that the SCRs required by the FIP Proposal essentially would have no impact. EPA found in its proposed rulemaking that "visibility benefits associated with NO_x reductions are more likely to occur in the winter months because this is when aerosol thermodynamics favors nitrate formation." 81 FR at 2031. Therefore, the SCRs that would be required by EPA's FIP Proposal, which are designed to reduce NO_x, would be of greatest benefit in the winter months. However, EPA fails to recognize or consider the monitored data which demonstrates that nitrates have very little impact on visibility impairment during the 20% best days, which often occur in the winter months. See Hoffnagle Report at 11, tbl. 2. EPA should have considered this point in its FIP Proposal, and did not.

Contrary to its own guidance, in support of its FIP Proposal EPA failed to use a more realistic air quality model (CALPUFF version 6.42) than the outdated CALPUFF version 5.8. Appendix W, EPA's modeling guidance, demands that the "best" model should be used. EPA failed to use the "best" model in its FIP Proposal. Therefore, EPA failed to follow Appendix W's requirements. App. W.1.0.e ("(I)n all cases, the model applied to a given situation should be the one that provides the most accurate representation of atmospheric transport, dispersion, and chemical transformations in the area of interest."); App. W.1.0.d ("The model that most accurately estimates concentrations in the area of interest is always sought.") (emphasis added). EPA's outdated modeling approach relying on CALPUFF version 5.8.4, fails to meet the requirements of Appendix W.[524]

In its FIP Proposal, EPA did not use the "best" model (CALPUFF v. 6.42) or account for the flaws and limitations of the model it used. However, EPA claims to use the draft 2015 revisions to the CCM to reflect updated SCR cost analyses. See, e.g., 81 FR at 2032. It is arbitrary and capricious to use a draft, updated cost manual but not use an updated, proven visibility model.

Response: We used the current EPA-approved version of CALPUFF (Version 5.8.4, Level 130731). We disagree with the commenters that a new CALPUFF version should be used for the BART determination. We relied on version 5.8 of CALPUFF because it is the version approved by EPA through a public notice and comment rulemaking, in accordance with the Guideline on Air Quality Models ("GAQM", 40 CFR part 51, Appendix W, section 6.2.1.e).[525] Later versions of CALPUFF are not approved by EPA for regulatory purposes, and we do not agree that the changes made to this most recent version of CALPUFF were simple model updates to address bugs. A full evaluation of a new model such as CALPUFF version 6.4 is needed before it should be used for regulatory purposes as errors that are not immediately apparent can be introduced along with new model features. The newer versions of the model introduce additional chemical mechanisms that have not gone through the public review process required for approval by the Agency. With respect to the commenter's position that because EPA did not use CALPUFF v. 6.42, the "EPA failed to follow Appendix W's requirements" to use the "best" model, we disagree. We do not agree that any new CALPUFF version should be presumed to be the "best" and therefore used for BART determinations. Appendix W requires the agency to evaluate modifications that may affect concentration estimates prior to approving newer model versions (40 CFR part 51 Appendix W Section 3.2.2.), thus the "newest" model does not equate to the "best" model as the commenter implies.

[524] Interestingly, EPA has proposed that the BART Guidelines "no longer contain language that requires the use of CALPUFF or another Lagrangian puff model for long range transport assessments." 80 FR 45340, 45349. In that proposed rulemaking, EPA admits the "availability of more appropriate modeling techniques, such as photochemical transport models (which address limitations of models like CALPUFF)." Id. Yet, in its FIP Proposal, EPA failed to use a "more appropriate" model, such as a "photochemical transport model," or to even recognize the "limitations of models like CALPUFF." EPA's NO_x BART determinations are invalid as a result.

[525] BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.E.5.

Comment: [PacifiCorp, p. 52] *EPA applies the CALPUFF model to Class I areas that are beyond the model's geographic capabilities.* In its FIP Proposal, EPA indicates that it applied the CALPUFF model to 9 Class I areas, some of which are almost 300 kilometers or more distant from Utah's BART Sources. See e.g., 81 FR at 2035-36. EPA relied upon modeled "visibility improvements" in all nine Class I areas to justify its FIP Proposal. Id. at 2036-38. However, as explained above, CALPUFF has a large margin of error at 100 km and the inaccuracy likely grows at greater distances. The CALPUFF model "is not demonstrably valid beyond 100 kilometers and we can judge its margin of error at that distance but not beyond." See Hoffnagle Report at 12. As Mr. Hoffnagle explains, only three of the nine Class I areas addressed in EPA's FIP Proposal are within a distance where we can rely upon the results for gaseous concentrations to be within a range where we know the margin of error. Id. Therefore, EPA's FIP Proposal is invalid because it relies on CALPUFF modeled visibility improvements at Class I areas at distances up to 300 kilometer without making any adjustments or allowances for the impact of distance on these results, or by referring to monitored data to check the validity of the results.

Response: Our response to the reliability of CALPUFF used for distances up to 300 km is provided elsewhere in this document.

Comment: [SCCAW, written hearing statement] One commenter expressed trepidation over use of CALPUFF. In 2002-2008 the commenter challenged the UDAQ air quality permit issued to Sevier Power Co. CALPUFF was used to approximate transport ranges of airborne pollution between Wasatch Front and Sevier Valley, a distance of 160 miles. Despite UDAQ claims/analysis, citizens could see the pollution plume for themselves. The commenter fears that some of the same modeling being used in current analysis of Hunter and Huntington plants could give impression that proposals may not be as effective as modeled regarding cleansing the air in our Class I areas.

Response: We acknowledge the background information provided by the commenter. EPA's *Guideline on Air Quality Models*[526] provides background on the needs expressed by the States and EPA Regional Offices, by many industries and trade associations, and also by the deliberations of Congress, that consistency in the selection and application of models should be sought. Consistency ensures that air quality control agencies and the general public have a common basis for estimating pollutant concentrations, assessing control strategies and specifying emission limits. Both EPA and the State of Utah used the current EPA-approved version of CALPUFF (Version 5.8.4, Level 130731) to conduct visibility modeling.

Comment: [Transcript p. 61] Describing EPA's modeling effort, one commenter said EPA arbitrarily skipped making a connection regarding how emissions reductions from the power plants translates into reducing emissions at the national parks.

[526] 40 CFR part 51, Appendix W.

Response: We thank those who attended and participated at our public hearings. Please refer to our modeling protocol for (1) a detailed explanation of how EPA conducted the modeling, and (2) predicted visibility impact results from varying emission controls.

Comment: [PacifiCorp, p. 45] Visibility Improvement EPA's BART visibility improvement analyses for its FIP Proposal fail in several respects, and thus fail to meet the statutory requirements.

When EPA conducted its "reasonably anticipated" visibility improvement analyses for its NO_x BART determinations of the Utah BART Units, EPA relied exclusively on computerized modeling results, using the CALPUFF model. See 81 FR at 2033. EPA did not use Utah's previous CALPUFF modeling to support its FIP Proposal,[527] instead EPA "developed separate CALPUFF modeling for this purpose." *Id.* In fact, although Utah's CALPUFF modeling assessed the "combined impacts of all of the BART and non-BART sources included in the BART Alternative," EPA mistakenly only modeled "the impacts of the individual BART sources." *Id.* EPA also claims that, beyond "assessing impacts from individual BART sources and evaluating all technically feasible control options," EPA's modeling was "otherwise very similar to that employed by Utah." *Id.* Again, EPA is mistaken.

In short, EPA's NO_x BART determinations in its FIP Proposal, particularly the visibility analyses, are fatally flawed because EPA relied on CALPUFF modeling results without considering: (1) the limitations of the CALPUFF v. 5.8 model; (2) the CALPUFF model's related "margins of error;" (3) EPA's mistakes running the CALPUFF model; and (4) actual monitored data and other data that called into question EPA's ability to solely rely on the CALPUFF modeled results without accounting for the model's limitations.

Response: Our responses to the use of CALPUFF 5.8.4., the CALPUFF's model's related "margin of error", and concerns regarding our modeling protocol can be found elsewhere in this document.

Comment: **[Conserv Orgs – Gray Report, pp. 33-34]** Misleading Tables - In reviewing EPA's modeling protocol and BART analysis, I identified several errors and misleading presentation of

[527] Proper conclusions can be reached when evaluating the results of visibility modeling if one understands the limitations of the models, the characteristics and limitations of the inputs entered into the models, the capabilities of the model versions being used and then applies reasonable judgment to the results. Utah created its SIP Proposal based on the modeling protocols and versions required by EPA. In proposing its SIP Proposal, Utah evaluated the CALPUFF model output with an understanding of the model's limitations. Utah then applied its judgment and experience in comparing the model results to actual monitored data, as encouraged by EPA's guidelines and the CAA. Utah's approach helped mitigate the problems associated with the CALPUFF visibility model's documented tendency to greatly over-predict the visibility improvement associated with BART controls. In fact, Utah analyzed other scientific data to determine the impacts of SO2 and NO_x emissions from the BART units, and used that information in determining the amount of weight to give CALPUFF modeling results. Contrary to this approach, EPA interpreted the CALPUFF modeling results as "absolute" and unquestioningly accurate numbers that EPA then relies on to justify costly NO_x BART controls that in reality will provide no "reasonably anticipated" visibility benefit.

data. On page 14 of its modeling protocol document, EPA states: "The visibility impacts for all modeled scenarios are reported in Appendix H. This includes the impacts for each BART unit at all modeled Class I areas and meteorological years. The tables in Appendix H present the model results for each BART-eligible unit using various visibility metrics (98th percentile impacts, and the number of days in which delta dv is greater than 0.5 and 1.0)."

The tables that show the predicted visibility impacts (98th percentile delta dv) for the individual units (Tables H.1 through H.4) include the combined impact from both units at each facility, although the titles above each table indicate that the impacts shown are just for the individual unit. (The statement on page 14, cited above, also proclaims that the impacts from each individual unit are shown in the tables.) For example the "Baseline" column for the Hunter Unit 1 table (Table H.1) includes the impacts from both Hunter units, both of which were modeled at baseline emission levels. Each successive column (for LNB/SOFA, LNB/SOFA with SNCR, and LNB/SOFA with SCR) shows the impact (98th percentile delta dv) due to both Hunter units, with emission reductions that have been applied only to Hunter Unit 1 (with Hunter Unit 2 modeled at baseline emission levels for all scenarios). The differences between the visibility impacts for the various control technologies represent the effect of the controls on the individual units and so the modeling data are being properly used to compare the various control technologies. However the title of the tables are misleading, and should indicate that the impacts shown are for both Hunter Units 1 and 2, but that the control technologies identified in each column heading (LNB/SOFA, LNB/SOFA with SNCR, and LNB/SOFA with SCR) are only applied to the individual unit. Similarly to Tables H.1 through H.4, the titles of these tables are misleading. The values shown in the table represent the impacts due to emissions from both units at each facility, despite the title which indicates that the table only accounts for the impacts from an individual unit. These tables should be relabeled to indicate that he impacts shown are for both units. Tables H.13 through H.16 present the identical information, but summed across the three model years, and therefore the same mislabeling problem also exists in the titles to these tables.

These tables all have titles that need to be relabeled to indicate that the impacts shown are for both units, with the control technologies only applied to one unit.

Response: The commenter is correct that Tables H.1. through H.4. within EPA's modeling protocol[528] represent visibility impacts for both units (i.e. Hunter 1 and 2 or Huntington 1 and 2) with control technologies applied to one unit. The methodology is correctly described within the protocol in section 4.3, section 5.3, and section 6.

Comment: **[Conserv Orgs – Gray Report, p. 33]** I also conducted CALPUFF modeling (in December 2014) to determine the expected visibility improvements due to each of the same three control technologies that EPA considered, applied to each individual BART-eligible unit.[529] The

[528] Air Quality Modeling Protocol: Utah Regional Haze Federal Implementation Plan, EPA, November 2015.
[529] Gray, H. A., "Visibility Impacts at Class I Areas Due to Emissions from the Hunter and Huntington Power Plants", December 22, 2014.

model results (using the same visibility metrics that EPA used) were assembled into an attachment to my modeling report (dated December 22, 2014), which is reproduced as Attachment A of this report. My modeled differences of the visibility impacts between the three control technologies were very similar to the results obtained by EPA.[530] For example, EPA's model results for Hunter Unit 1 (co-proposal, Table 15) indicate that LNB/SOFA with SNCR would result in a 0.80 dv improvement of the maximum modeled 98th percentile delta dv during the three model years at all nine Class I areas (summed), relative to the LNB/SOFA technology. Similarly, LNB/SOFA with SCR on Hunter Unit 1 would result in an improvement in the same visibility metric of 2.12 dv relative to LNB/SOFA with SNCR. My model results for Hunter Unit 1 indicate that LNB/SOFA with SNCR would be 1.08 dv better than LNB/SOFA, using the same cumulative maximum 98th percentile metric. For LNB/SOFA with SCR at Hunter Unit 1, my model results indicate that the same visibility metric would improve by 2.31 dv, relative to LNB/SOFA with SNCR. My model results, comparing LNB/SOFA with SCR to LNB/SOFA with SNCR, and also to LNB/SOFA, were quite similar to EPA's results (when considering the differences between the impacts for each control at each individual unit). Both sets of modeling results demonstrate that LNB/SOFA with SCR results in significantly lower visibility impacts than LNB/SOFA with SNCR, or just LNB/SOFA, at all of the modeled Class I areas. This consistent set of model results strongly supports EPA's conclusion that BART should require SCR at each of the four BART-eligible facilities.

Response: We acknowledge the commenter's modeling efforts, noting that we would anticipate visibility benefits predicted by the commenter's modeling to be somewhat higher than EPA's predicted benefits because EPA used POSTUTIL and CALPOST to process the CALPUFF results for ammonia limiting conditions as described in our modeling protocol. Thus, even if we accepted the commenter's modeling, we would still select SCR + LNB/SOFA as BART for the Hunter and Huntington BART units.

h. Compliance Date

Comment: [UDAQ-HT, p. 22] EPA acknowledges in the proposal to approve, that all controls required by the Utah Regional Haze SIP are installed and, therefore, meet the "requirement that all necessary emissions reductions take place during the period of the first long-term strategy for regional haze." EPA states in the proposed FIP that installation of SCR, or the BART controls, would be fully implemented between 2019 and 2021. According to the RHR, this is not allowed, as it is past the end of the current planning period.

Response: See response below.

[530] EPA's modeling results represented the combined impacts of the two units at each facility, whereas my model results showed the visibility impacts due to the emissions of each unit separately. However, both modeling approaches considered controls on only unit at a time, so the differences between the modeled impacts can be used from both modeling approaches to compare the merits of each control technology at each power plant unit.

Comment: [UDAQ, p. 23] BART controls cannot legally be required to be installed after 2018 because it is past the end of the planning period. EPA acknowledges in the proposal to approve Utah's submittal that all the controls required byUtah's RH SIP are installed and, therefore, meet the "requirement that all necessary emissions reductions take place during the period of the first long- term strategy for regional haze." 40 CFR 51.308(e)(2)(iii). EPA states in the proposed FIP that installation of SCR, or the BART controls, would be fully implemented between 2019 and 2021—a minimum of one year after the end of the 2018 planning period end date. Because EPA's proposed FIP would not be fully implemented until after the planning period, this option is contrary to the RHR (40 CFR 51.308(e)(2)(iii)).

Response: The requirement to install controls by the end of the first planning period cited by the commenter applies to states that opt to implement trading programs or alternative measures under §51.308(e)(2) of the RHR. However, we are not adopting our FIP pursuant to this provision, but to §51.308(e)(1) of the RHR which states that "each source subject to BART be required to install controls as expeditiously as possible, but in no event later than 5 years after approval of the implementation plan revision."[531] We anticipate that our final rule will become effective in the summer of 2016, so that the compliance date will fall sometime in the summer of 2021. Accordingly, we find that the compliance dates specified in our FIP are consistent with the requirements of the RHR. We also note that the commenter's theory does not make sense – if approval of the plan revision were considerably delayed for various reasons such as protracted litigation, under the commenter's theory BART could never be implemented. And under section 110(c)(1), EPA is required to promulgate a FIP to address deficiencies in a State's SIP, regardless of the original timeline for the State's SIP.

i. Consideration of Existing Controls

Comment: [PacifiCorp, p. 29] The Eighth Circuit rejected EPA's "existing control" interpretation -- Not only does EPA's "existing controls" approach in the FIP Proposal violate the BART Guidelines, but courts have rejected EPA's approach as well. In *North Dakota*, a power company had installed pollution control equipment two years before EPA conducted its BART determination. *North Dakota v. EPA*, 730 F.3d 750, 760 (8th Cir. 2013). The power company argued EPA should consider the existing controls when calculating cost effectiveness, among other things. EPA refused, unsuccessfully arguing that it "was not required to reconsider cost estimates based on voluntarily installed controls installed after the baseline period." *Id.* at 762. The Eighth Circuit rejected EPA's actions, and its excuses. The *North Dakota* court held that "EPA's refusal to consider the existing pollution control technology in use at the Coal Creek Station because it had been voluntarily installed was arbitrary and capricious." *Id.* at 764. The court further held EPA's failure to properly consider the "existing pollution control technology" was contrary to the plain language of the CAA and rejected part of EPA's FIP on this basis. *Id.* at 762-64.

[531] 40 CFR 51.308(e)(1)(iv).

Here, EPA repeated the same mistake for the Utah BART Units in the FIP Proposal. EPA's NO_x BART determinations failed to properly account for the low NO_x burners and over-fire air systems ("LNB/OFA") that already had been installed when EPA conducted its BART cost and visibility improvement analyses. Also, EPA refused to consider the existing LNB/OFA for the same reason the court rejected in *North Dakota*: because EPA did not approve the LNB/OFA installation as BART. *See, e.g.*, 81 FR at 2036.[532] EPA's actions in the FIP Proposal are just as illegal as its actions in *North Dakota*. EPA must redo its NO_x BART determinations in the FIP Proposal to account for the "existing controls" in the baseline emissions, BART cost analyses, and BART visibility improvement analyses for the Utah BART Units.

EPA's "existing controls" mistake has significant consequences and materially skews EPA's NO_x BART analyses at the Utah BART Units. For example, using outdated baseline emissions data that did not recognize existing controls, EPA calculated "cost-effectiveness" for NO_x BART at Hunter Unit 1 assuming that new LNB/OFA had not been installed. *See e.g.*, 81 FR at 2004, 2,034 tbl. 13, 2036. EPA's failure to consider Hunter Unit 1's existing NO_x controls caused EPA to overestimate the cost effectiveness of SCR by crediting SCR with the future removal of NO_x emissions that, in fact, are already being removed by the existing LNB/OFA. This mistake was caused in large part by EPA's refusal to consider "existing controls" as part of its baseline emission analysis. "Baseline emissions" are an elemental part of a BART cost-effectiveness calculation. 40 C.F.R. Part 51, App. Y, § IV.D.4.d.

EPA also artificially inflated the calculated visibility improvement from SCR by combining the modeled visibility improvement for SCR (which has not yet been installed) with the modeled visibility improvement of LNB/OFA (which EPA knows has already been installed). *See e.g.* 81 FR at 2,004, 2035-36. Once the CALPUFF modeled visibility improvements from LNB/OFA are removed from that attributed to SCR (1.55 dv at the most impacted Class I area according to EPA's flawed modeling data), the calculated visibility improvements from SCR shrink to 0.70 -- less than the perceptible level of 1.0 dv. Id. at 2035, tbl 15. Many of EPA's other calculated visibility improvements, once the gains from existing LNB/OFA are removed, shrink to numbers that fall within the margin of error for the CALPUFF model, and that cannot be used to justify EPA's FIP Proposal. *Nat'l Parks Conservation Ass'n v. E.P.A.*, 788 F.3d 1134, 1147 (9th Cir. 2015).

In essence, as a result of EPA ignoring the "existing controls" at the Utah BART Units, EPA's NO_x BART analyses ask the wrong question. Instead of asking, "what cost and visibility improvements are associated with the installation of LNB/OFA and SCR, even though LNB/OFA are already installed?" EPA should have asked, "what cost and visibility improvements are associated with the installation solely of SCR?"

[532] Moreover, EPA's decision to ignore the "existing controls" is counter-intuitive. As explained above, the "existing controls" have resulted in emissions reductions and related modeled visibility improvements years before EPA's FIP Proposal.

Response: We disagree. First, the comment conflates the interpretation that EPA took in the *North Dakota* action of the "any existing pollution control technology in use at the source" BART factor with the interpretation that EPA is taking in this action. Here is how the Eighth Circuit characterized the North Dakota action:

> During its BART analysis EPA refused to consider the DryFining™ pollution control technology in use at the Coal Creek Station, stating in its Final Rule that "DryFining™ was not installed until after the baseline period and was installed voluntarily, not to meet any regulatory requirement[,]" and that EPA was not required to reconsider cost estimates based on voluntarily installed controls installed after the baseline period. 77 Fed. Reg. 20,918. Great River Energy contends that EPA's refusal to consider the voluntarily installed pollution control technology in use at the Coal Creek Station demonstrates that EPA failed to consider all of the statutory factors required under 42 U.S.C. § 7491(g)(2) and 40 C.F.R. § 51.308(e)(1)(i)(A) and that its BART determination must therefore be vacated.
>
> EPA contends that it was not required to consider the voluntarily installed pollution controls at the Coal Creek Station, including the DryFining™ technology, because it permissibly interpreted the ambiguous phrase "existing pollution control technology in use at the source" to mean existing technology "incorporated into emission limits in an approved SIP or specified in a Clean Air Act permit for the facility and . . . adopted to meet Clean Air Act requirements." EPA Br. 82. Making no mention of or giving any significance to the word "any" in § 7491(g)(2), EPA argues that its interpretation of the ambiguous statutory language "existing pollution control technology" is entitled to deference, presumably under *Chevron, U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 104 S. Ct. 2778, 81 L. Ed. 2d 694 (1984). Great River Energy contends that EPA's interpretation of "any existing pollution controls" is entitled to no deference because the statutory language at issue is clear and unequivocal, not ambiguous.

North Dakota v. U.S. EPA, 730 F.3d 750, 762-63 (8th Cir. 2014). After considering the meaning of the term "any" in this BART factor, the Court then went on to hold that EPA's interpretation was not permissible: "Because we find no ambiguity in the kind of technologies that must be considered under § 7491(g)(2), EPA's interpretation that it was not required to consider the existing pollution control technologies in use at the Coal Creek Station is entitled to no deference." *Id.* at 764. The Court did not examine the meaning of the phrase "take into consideration." *See generally id.*

In this action, we are not adopting an interpretation that "<u>any</u> existing pollution control technology in use at the source" means <u>only</u> existing technology "incorporated into emission limits in an approved SIP or specified in a Clean Air Act permit for the facility and . . . adopted to meet Clean Air Act requirements," the interpretation EPA adopted in the North Dakota action. We acknowledge that LNB/SOFA fall under "any existing pollution control technology in use at

the source" and therefore must be "considered" in our BART determination. Thus, the commenter's citation to *North Dakota* is beside the point. Please see our responses elsewhere about the term "consider," *Chevron*, the BART Guidelines, and the baseline. We have considered the existing controls in several ways. First, we considered whether the existing combustion controls could be upgraded or replaced, and determined that upgrading or replacing them was not feasible. In this part of our BART determination, we adopted the analysis done by Utah of the feasible control options. This is consistent with the BART Guidelines, which state: "[f]or emission units subject to a BART review, there will often be control measures or devices already in place. For such emission units, it is important to include control options that involve improvements to existing controls and not to limit the control options only to those measures that involve a complete replacement of control devices." 40 CFR pt. 51, app. Y, at IV.D.1.6. Second, as mentioned in another response, we examined the existing combustion controls to determine that they do not preclude the use of post-combustion controls (SNCR and SCR), and we used the lower NO_x rate resulting from the existing combustion controls in our analysis of the cost-effectiveness of SNCR and SCR.

Third, we computed the incremental cost-effectiveness of SNCR and SCR relative to the existing controls, and we considered this incremental cost-effectiveness in making our BART determinations. Finally, we computed the incremental visibility benefit of SNCR and SCR relative to the existing controls, and we considered this incremental visibility benefit in making our BART determinations. In fact, by doing these latter two, we answered the question the comment states we should have asked: "what cost and visibility improvements are associated with the installation solely of SCR?"

As this commenter admits elsewhere, EPA did not "fail to consider" the existing controls. Instead, the commenter argues that EPA cannot consider them for some purposes and not others. As explained in our response discussing the meaning of the term "consider" and *Chevron*, the statute is silent on how to consider existing controls. In this section we have explained how we considered them and why our consideration is reasonable. In the section discussing "consider" and *Chevron*, we explain why it is reasonable to not use a post-installation baseline in this particular situation. This is all that is required.

We disagree that the incremental visibility improvement for SCR is insufficient to justify it. Our comparisons with other BART determinations show otherwise. In addition, it would be incongruous to have the subject-to-BART (for contributing to visibility impairment) threshold at 0.5 dv and then find that a greater visibility improvement than that is not significant.
In fact, our comparison with other BART determinations that used a baseline that included combustion controls that had been installed for other CAA purposes shows that even if we accepted this commenter's argument, we would still select SCR in light of its significant visibility improvements at the impacted Class I areas and reasonable costs (as determined through the incremental visibility benefits and cost-effectiveness). The incremental cost-effectiveness of SCR + LNB/SOFA over LNB/SOFA ranges from $5,206/ton to $5,861/ton at the four BART units. These cost-effectiveness values are reasonable in light of the significant incremental visibility improvement, ranging from 0.428 dv at Hunter Unit 2 to 0.768 dv at

Huntington Unit 1, at the most impacted Class I area, and significant improvements at the other Class I areas. This reasonableness is demonstrated by our comparison with other BART determinations, as described in the preamble and elsewhere in this RTC.

We disagree with the claim that our use of a pre-installation baseline is "counter-intuitive," because the combustion controls have been achieving emissions reductions already. While that might be relevant to considering reasonable progress, it is not relevant to a BART determination. This is exactly the same situation as one in which a source has recently and temporarily curtailed operations. While that temporary curtailment achieves emissions reductions, it does not provide a realistic depiction of anticipated emissions.

We respond to comments about the margin of error in CALPUFF elsewhere.

Comment: [PacifiCorp, p. 31] EPA considered "existing controls" at Cholla Unit 4 -- EPA's refusal to recognize existing NO_x controls at the Utah BART Units is contrary to not only the BART statute, BART Guidelines, and existing case law, but is also contrary to EPA's past practice at one of PacifiCorp's other units in Arizona (Cholla Unit 4). In the Arizona regional haze rulemaking, EPA said:

> "The presence of existing pollution control technology is reflected in the BART analysis in two ways: First, in the consideration of available control technologies . . . , and second, in the development of baseline emission rates for use in cost calculations and visibility modeling. . . . AEPCO, APS, and SRP used baseline time periods that varied from 2001 to 2007. The respective baseline emissions and existing pollution control technology used in the BART analyses reflect the levels of control in place at the time. EPA considers ADEQ's approach to be reasonable and generally consistent with the [Regional Haze Rule] and the BART Guidelines." Arizona Proposed RH Rule, See 77 FR at 42834, 42841 (emphasis added).

Moreover, EPA found that adjusting baseline emissions to account for existing controls was necessary to get a "realistic estimate of current visibility impacts and the effect of BART controls." See 77 FR at 42854. EPA reiterated this position in the Arizona Final RH Rule. See 77 FR at 72512, 72526 ("This provision is consistent with the statutory requirement that each BART determination take into consideration 'any existing pollution control technology at the source' . . . in order to 'represent a realistic depiction of anticipated annual emissions for the source' the baseline can account for controls already installed on the source.").

In Arizona, EPA recognized that since it had disapproved Arizona's BART determinations for NO_x, EPA was "obligated to conduct [its] own five-factor BART analyses for NO_x" and included "existing" NO_x controls in the EPA's BART baseline emissions analysis, including for Cholla. Id. Here, contrary to its clear position in Arizona and Colorado (and for the Cholla and Hayden power plants, which EPA cites in the FIP Proposal as BART comparisons for the Utah BART Units), EPA ignored existing controls in the development of baseline emission rates. Due to

EPA's inconsistencies in applying the baseline emissions methods, EPA's actions are arbitrary and capricious.

In its FIP Proposal, EPA compared the cost and visibility analyses from the Utah BART Units to the analyses from the Cholla power plant in Arizona. See e.g., 81 at 2037. PacifiCorp owns Unit 4 at the Cholla power plant. EPA considered existing controls when setting the baseline emissions data for Cholla Unit 4, but will not consider existing controls when setting the baseline emissions data for the Utah BART Units, which PacifiCorp also owns and operates. The "awkwardness" and inconsistency of this approach can be seen in EPA's own comparison language. For example, for Hunter Unit 1, EPA states, "as with Hayden, the *average* cost effectiveness of SCR at Cholla should be compared with the *incremental* cost-effectiveness of SCR . . . at Hunter Unit 1." Id. (emphasis added). Why does EPA require *average* cost effectiveness numbers at Hayden and Cholla to be compared with *incremental* cost effectiveness numbers at Hunter and Huntington? The reason: EPA is arbitrarily applying a different "baseline emissions" method to Hunter and Huntington that skews the "average cost-effectiveness number" and makes it incomparable to the same numbers at Hayden and Cholla. It is arbitrary and capricious to apply to different interpretations of the "existing controls" statutory requirement different power plants within PacifiCorp's system and to BART determinations EPA uses for comparison.

Response: We disagree. First, the comment mischaracterizes EPA's action here as "failing to consider" existing controls. Please see the previous response.
Second, the quoted statement from the proposal for action on Arizona's regional haze submittal was a generic statement about existing controls that did not address the situation where the controls had been installed as the result of a state's insufficient BART determination (insufficient in the sense of not meeting CAA requirements) that was disapproved by EPA. That is the situation here – the combustion controls at Hunter and Huntington were installed pursuant to the State's NO_x BART determination, which was disapproved by EPA.

In our final Arizona action, EPA explained why it used an updated baseline for units at both Coronado and Cholla. We first quoted from the BART Guidelines:

> When you project that future operating parameters (e.g., limited hours of operation or capacity utilization, type of fuel, raw materials or product mix or type) will differ from past practice, and if this projection has a deciding effect in the BART determination, then you must make these parameters or assumptions into enforceable limitations. In the absence of enforceable limitations, you calculate baseline emissions based upon continuation of past practice.

77 FR 72526/3 (quoting 40 CFR Part 51, Appendix Y, section IV.D.4.d.2.). We then explained:

> Consistent with this provision, for Coronado we used the consent decree mandated NO_x emission limit of 0.08 lb/MMBtu in order to ensurethat the baseline emissions rate would represent a realistic depiction of antic ipated annual emissions for Unit

> 2. We note that such an ''updated baseline'' might not be appropriate in all instances. For instance, if it appeared that controls had been installed early in order to avoid a more stringent BART determination, it would presumably not be appropriate to use a baseline representing these new controls. We find no evidence of such intent here. Rather, with respect to Corona do, the installation of new NO_x and SO_2 controls was required by a consent decree. With respect to Cholla, the installation of newly installed NO_x and SO_2 controls coincided with increases in potential emissions of these pollutants resulting from a change in coal supply. Therefore, the more recent baseline is likely to be more representative of future operating conditions at these units.

Id. In neither case (Coronado or Cholla) were the controls installed pursuant to a state BART determination that was ultimately disapproved, which is the case for Hunter and Huntington. As explained elsewhere in this RTC, by their very nature, baseline emissions should be "a realistic depiction of anticipated annual emissions" *before* the installation of BART so that the cost-effectiveness and visibility benefits of all potential BART control options can be evaluated from a consistent benchmark. Furthermore, when a state BART determination and corresponding emission limitation have been disapproved, then the emission limitation is not federally enforceable, and therefore under the BART Guidelines the baseline should be based on "past practice," i.e. actual emissions prior to the state BART determination. Thus, our action here is in fact consistent with the Arizona action and the BART Guidelines.
In the case of PSC Hayden Station Units 1 and 2, the source installed combustion controls in 1999 pursuant to a consent decree:

> As part of a Consent Decree, entered by the United States District Court on August 19, 1996, Civil Action 93-B-1749, the following emission control devices were required to be installed on both Units 1 and 2: *low* NO_x *burners with over-fire air (to control* NO_x *emissions),* lime spray dryers (to control SO_2 emissions) and fabric filter dust collectors (to control PM emissions). The Consent Decree required that startup testing of the control devices on Unit 1 commence by December 31, 1998 and that startup testing of the control devices on Unit 2 commence by December 31, 1999. As of October 18, 1999 all control equipment required by the Consent Decree had been placed into service.

Technical Review Document, Renewal/Modification of Operating Permit 96OPRO132, Public Service Company – Hayden Station, Colorado Department of Health and Environment at 2 (2007-2008) (emphasis added). In its BART determination for Hayden Station Units 1 and 2, the Department used a 2006-2008 baseline, which postdates the installation of the combustion controls. Best Available Retrofit Technology (BART) Analysis of Control Options For Public Service Company – Hayden Station, Colorado Department of Health and Environment at 2.
As the combustion controls at Hayden Station were installed pursuant to a consent decree to resolve violations of CAA requirements other than a proposed BART determination, this situation falls within those where the baseline is permissibly set after installation of controls to reflect realistic anticipated emissions, and is consistent with the approach taken for Coronado in

the Arizona action. We also note that the Department considered upgrading the combustion controls in its BART analysis. Id. at 13. This is consistent with the Guidelines and one way in which we considered existing controls in this action. Ultimately, the Department determined that BART was SCR (apparently without an upgrade to the combustion controls), represented by limits of 0.08 lb/MMBtu and 0.07 lb/MMBtu limits for Units 1 and 2, respectively. Thus, the Department's analysis is consistent with our approach here. For more details regarding the comparison of our BART determination for Hunter Units 1 and 2 and Huntington Units 1 and 2 with Hayden Station Units 1 and 2, please see the preamble and responses elsewhere in this RTC.

Comment: [PacifiCorp, p. 32] EPA Has Considered Existing Controls in Other Settings in Utah -- Not only are EPA's actions inconsistent with its BART analyses in Colorado and Arizona, but EPA's FIP Proposal is inconsistent with other EPA actions in Utah. Paragraph 11 of DG&T's settlement agreement with EPA Region 8 provides that "in conducting any reasonable progress analysis under the regional haze rule, EPA Region 8 acknowledges that in calculating Deseret's baseline emissions EPA Region 8 intends to reflect any emission reductions that result from a final LNB/OFA Minor NSR [New Source Review] Permit and installation of LNB/OFA." Considering existing LNB/OFA at one power plant in Utah for baseline emissions purposes (particularly one that EPA has allowed to escape any previous regional haze analyses), but not another, is the very definition of arbitrary and capricious.

EPA's refusal to meaningfully consider the "existing" NO_x controls at Hunter and Huntington as a substantive part of its BART cost and visibility improvement analyses is forcibly contrary to EPA's statements and actions in Arizona, Colorado, Utah, the North Dakota decision, and the BART statute and Guidelines. EPA should withdraw its FIP Proposal and approve Utah's SIP Proposal.

Response: We disagree. Under the cited language, Deseret Bonanza's installation of LNB/OFA would be reflected in an EPA-issued minor NSR permit and would be federally enforceable. This is entirely consistent with our action here. Please see our responses elsewhere discussing the appropriate baseline where there are federally enforceable controls resulting from CAA requirements other than BART. With respect to whether the Deseret Bonanza facility has "escaped" regional haze requirements, the facility does not have any BART-eligible units; the timing and scope of reasonable progress requirements are not relevant to our BART determinations for Hunter and Huntington and are outside the scope of this rulemaking. We respond to the comments about Arizona and Colorado actions elsewhere.

Comment: [Conserv Orgs -- Stamper Report, p. 7]
Proper Baseline for NO_x ***BART Cost Effectiveness Evaluation and*** NO_x ***Control Schemes to Evaluate.***
The baseline period for determining NO_x BART must be from the 2001 to 2004 timeframe. As EPA stated in its July 1, 1999 regional haze rulemaking:
After considering public comments on the baseline issue, EPA has determined that the most appropriate ''baseline period'' would be a fixed, 5-year period extending from calendar year

2000 through calendar year 2004. The EPA concluded that a standard baseline period provides for greater national consistency in establishing this important value, and therefore, is preferable to a provision allowing the baseline period to be a variable number of years. Using a common number of years and data points to calculate the baseline value for each site is consistent with fundamental statistical principles and will provide for easy comparison of data from multiple sites as the program is implemented.
64 Fed. Reg. 35728 (July 1, 1999).

This regional haze requirement primarily pertains to baseline visibility conditions to determine the necessary rate of progress to attain natural background visibility conditions by 2064. EPA's "consistency" rationale requires that the baseline for the BART cost analysis cover a similar period. That way, when one is evaluating BART, one is evaluating both the costs and the visibility benefits of getting from the same baseline levels of emissions to the controlled emission level being evaluated as BART.

In other BART evaluations where a source has installed low NO_x burners and overfire air before the BART determination, EPA has evaluated NO_x BART based on a baseline period from before the installation of the pollution controls.[533]

Response: Although we agree that we appropriately chose the baseline period here, we do not agree with the broader statement that the baseline period for emissions must necessarily be 2000 or 2001 - 2004 for all BART determinations. As the commenter admits, the cited portion of the Regional Haze Rule is about the baseline period for current visibility conditions, not the baseline emissions at a source for determining BART. 64 FR 35728/3. As explained in the preamble for the BART Guidelines, the purpose of the baseline period for emissions is to estimate the anticipated visibility impacts in the absence of BART control options. 70 FR 39138. Thus, a baseline period of 2000 (or 2001) - 2004 is acceptable if it is a reasonable estimate of anticipated emissions.

However, as explained in our discussion of the Arizona action and of the term "consider" and *Chevron*, a baseline period that reflects controls installed at a later period can be used if the controls were installed for a CAA purpose other than BART and the requirement to use them (or an equivalent emission limitation) is federally enforceable. In that case, the later baseline period would reflect a realistic estimate of anticipated annual emissions. In turn, this produces realistic estimates of the cost-effectiveness of potential BART controls and of visibility benefits.
The cited actions are consistent with this. In the proposal for Navajo Generating Station, we stated: "In April 2009, SRP [Salt River Project] submitted a Prevention of Significant Deterioration (PSD) permit application to EPA Region 9 to *voluntarily* install and operate advanced combustion controls (LNB/SOFA) on Units 1--3. " 78 FR 8285 (emphasis added). As a result of an agreement between EPA, SRP, and Grand Canyon Trust, "EPA's analysis of the cost effectiveness of SCR used the baseline emission rate from 2001--2003, prior to the installation of

[533] *See* e.g., 78 FR 8285 (Feb. 5, 2013) (Proposed Rulemaking for Navajo Regional Haze Plan); 78 FR34738 (June 10, 2013) (Proposed rulemaking for Wyoming Regional Haze Plan). (FN18 in document).

the LNB/SOFA." Since the LNB/SOFA were installed prior to EPA's action, EPA considered them by computing the incremental cost-effectiveness of SCR + LNB/SOFA relative to LNB/SOFA alone. *Id.* This approach is consistent with our action here. Both actions used a baseline prior to the installation of combustion controls that were not required for CAA purposes, but also considered the installed combustion controls by examining the incremental cost-effectiveness.

In the proposal for our Wyoming action, we used the baseline from 2001-2003 for a separate reason: "In addition, for the PacifiCorp units, Wyoming calculated the baseline annual emissions used for determining cost effectiveness based on allowable emissions, rated heat input, and 7,884 hours of operation (equivalent to a 85% capacity factor), which are not representative of actual emissions from the baseline period." 78 Fed. Reg. 34749. Thus, the 2001-2003 baseline was chosen as a representative indicator of actual emissions, which is consistent with our response here.

Comment: [Conserv Orgs -- Stamper Report, p. 7]
The upgraded low NO_x burners and overfire air already installed at Hunter Units 1 and 2 and Huntington Units 1 and 2 do not preclude the installation of either an SNCR or an SCR system. Both of these post-combustion controls work in concert with the combustion controls recently installed at these units. In fact, the low NO_x burners and overfire air should be considered an inherent part of the SNCR and SCR BART control options, because the lower NO_x rates resulting from the combustion controls lower the SNCR and SCR sizing and reagent costs. Thus, even though PacifiCorp has installed low NO_x burners and overfire air at Hunter Units 1 and 2 and Huntington Units 1 and 2, the baseline for the NO_x BART analysis should be based on the emissions and controls in place in the 2001 to 2004 timeframe.

Response: We agree that the existing combustion controls do not preclude the use of post-combustion controls (SNCR and SCR), and that the lower NO_x rate resulting from the existing combustion controls affects the analysis of the cost-effectiveness of SNCR and SCR. This is one way in which we have considered the existing controls in our BART determinations. As explained in our previous response, we do not necessarily agree that a 2001-2004 baseline must be always used.

Comment: [NPS Tech, p. 7] It is essential to recognize that the BART Guidelines were not developed to explicitly address a situation in which we are evaluating the impacts of emission controls installed after the baseline period and currently in operation versus additional controls not yet installed.

Response: We agree that the BART Guidelines do not dictate that we use a baseline period after the installation of the emission controls. We explain elsewhere why our baseline period for this action is consistent with the BART Guidelines.

Comment: The EPA's insistence on the installation of SCR technology at the Huntington and Hunter plants is essentially an implementation of both options analyzed by the State of Utah, and

repeatedly approved of by the EPA, as the plants have already implemented the State's requirements, and have seen significant and sufficient reductions in PM_{10}, SO_2 and NO_x .

Response: For the reasons explained elsewhere, we have adequately addressed the NO_x controls that were installed pursuant to the State's BART determinations. We disagree with the suggestion that EPA approved those determinations; in fact, we previously disapproved them.

Comment: [UDAQ, p. 18] According to Section 169A(g)(2), a proper BART analysis considers the existing pollution control technology in use at the source. 42 U.S.C. § 7491(g)(2); 81 Fed. Reg. at 2032. With respect to existing controls, EPA itself states that "combustion controls, LNB and SOFA, have already been installed on Hunter Unit 1,[534] and so we consider them here as 'any existing controls' under the third statutory BART factor." 81 Fed. Reg.at 2034. Then, in an inexplicable about-face, EPA eliminated those acknowledged controls from consideration by stating the following:

> we have considered the existing pollution control technology in use at the source. We note that Hunter Unit 1 was equipped with LNB and SOFA in the spring of 2014 in order to meet state-law requirements in the 2011 Utah RH SIP submittal, which we did not approve.[535] In this co-proposal we have to evaluate control technologies and baseline emissions from the correct starting point, that is, prior to the installation of the combustion controls pursuant to state-law NO_x limitations. As a result, we used the period 2001–2003 as the appropriate period for baseline emissions, in order to provide a realistic depiction of annual emissions for Hunter Unit 1 prior to installation of combustion controls.

Response: We disagree. As explained elsewhere, the fact that we did not include the LNB/SOFA in the emissions baseline does not mean we failed to "consider" the existing controls. We also disagree that we have "waved the controls out of existence" based on our disapproval of the State's BART determinations. As explained elsewhere, we have considered the LNB/SOFA in a number of ways – our approach is reasonable and consistent with the statute and the Guidelines.

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[534] EPA's proposed FIP begins with Hunter Unit 1, but for RH purposes all the BART units in Utah are identical and the flawed aspects of EPA's analysis run uniformly through the entire FIP proposal. Accordingly, Utah's comments on Hunter Unit 1 apply equally to Hunter Unit 2, and to Huntington Units 1 and 2.

[535] EPA cannot so easily wave the existing controls out of existence by relying on its own failure to approve. In 2008, Utah submitted to EPA a RH SIP containing Utah's BART analyses for the four BART-eligible units located in Utah. EPA took no formal action with regard to this 2008 RH SIP, or on a minor 2011 revision that had no impact on the 2008 BART determinations, until EPA proposed partial disapproval of the 2011 RH SIP revision on May 16, 2012. By that time, 3 of the 4 scheduled installations of controls had already taken place. EPA cannot fail to meet its own statutory responsibilities, then use that failure as a basis for refusing to recognize the controls and associated reductions in regional-haze-causing emissions when conducting the BART analysis for its proposed FIP. If federal approval status were a factor, it would merely incentivize EPA to delay action on SIP submissions in order to impose later an EPA-preferred control alternative that the state did not choose.

Comment: [UDAQ, p. 19] EPA failed to consider existing controls when conducting the statutorily-required cost and visibility analyses for Hunter Unit 1, including establishing the baseline emissions to be used in the cost and visibility analyses without considering the existing controls. EPA's mistaken analysis affects all of the subject-to-BART units in Utah. EPA's improper determinations violate the CAA, the BART Guidelines, federal appellate case law, are inconsistent with its own previous determinations and is inconsistent even within its own proposed FIP. As such, EPA's conclusions here are arbitrary and capricious. Under Section 169A, when either a State or EPA determines BART, it must consider "any existing pollution control technology in use at the source[.]" 42 U.S.C. § 7491(g)(2). The statute is unambiguous—it does not allow EPA to consider "existing controls" for some purposes, but ignore them for others.[536]

Response: We disagree. Our responses to these overarching comments are given in detail in other responses in this section.

Comment: [UDAQ, pp. 19-20] Despite claiming to have considered "existing controls," EPA refused to consider the "existing controls" when setting the baseline emissions. It instead used a baseline emission rate founded on 2001-2003 data which did not include the controls that EPA (within this same proposed rulemaking) considered to be "existing controls." This internal inconsistency is arbitrary and capricious,[537] as EPA's explanation attempts to set a new baseline (2001-2003) without explaining why it is allowed to identify the currently-installed controls as the "existing controls" in Step 3 of the BART analysis, then eliminate them from consideration.

Response: We disagree. We explain elsewhere why we used the baseline we did. We did not eliminate the LNB/SOFA from consideration – we have considered them in a number of ways.

Comment: [UDAQ, p. 20] Moreover, EPA's use of 2001-2003 emissions data to establish the baseline emissions for the Utah BART units is neither "realistic" nor provides the "anticipated" emissions as required by the BART Guidelines. Using emissions information that fails to account for newer controls and reductions is not "realistic" because it ignores reality. For example, the 2001-2003 NO_x emissions rate for Hunter 1 was 0.40 lb/MMBtu. 81 Fed. Reg. at 2034, Table 13. After the installation of pollution control equipment in 2014, the actual NO_x emissions rate changed to 0.21 lb/MMBtu, a 48.4% decrease. *Id.* at 2034. Therefore, the old 2001-2003 emissions no longer represent the current reality at the BART units. EPA's attempt to use outdated emissions data to "anticipate" future emissions is nonsensical because the NO_x emissions rates at the BART units have changed. EPA repeated this same mistake for each of the Utah BART Units, which skews its BART analysis.

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[536] Even if the statute were not clear enough, EPA's regulations leave no doubt, as 40 CFR 51.308(e)(1)(ii)(A) refers to "any pollution control equipment *in use* at the source." (Emphasis added).

[537] *See Nat'l Parks Conserv. Assoc. v. EPA*, 788 F.3d 1134, 1141 (9thCir. 2015) (citing *Gen.Chem. Corp. v. United States*, 817 F.2d 844, 857 (D.C. Cir. 1987) (per curiam)) ("EPA's actions must also be consistent; an internally inconsistent analysis is arbitrary and capricious.").

Response: We disagree. As explained elsewhere, the baseline emissions should be a realistic estimated of anticipated emissions before the installation of BART. It would make no sense to include controls installed pursuant to a proposed BART determination in the baseline.

Comment: [UDAQ, p. 20] EPA's "existing controls" approach not only violates the BART Guidelines, but such an approach has been rejected by the courts. In North Dakota v. EPA, a power company argued that EPA should consider the existing controls when calculating cost effectiveness, among other things, as the controls had been installed two years before EPA conducted its BART analysis. 730 F.3d 750, 760 (8th Cir. 2013). EPA unsuccessfully argued that it "was not required to reconsider cost estimates based on voluntarily installed controls installed after the baseline period." *Id.* at 762. The Eighth Circuit disagreed, holding that "EPA's refusal to consider the existing pollution control technology in use at the Coal Creek Station because it had been voluntarily installed was arbitrary and capricious."[538] *Id.* at 764. The court further held EPA's failure to account for the "existing pollution control technology" BART factor was contrary to the plain language of the CAA and rejected part of EPA's FIP on that basis. *Id.* at 762-64.

With respect to Utah's BART units, EPA repeated the same error. EPA's NO_x BART determinations for Hunter and Huntington fail to consider properly the LNB/SOFA that were already installed at the time EPA conducted its BART cost and visibility improvement analyses. EPA's explanation here for not considering the existing LNB/SOFA as existing controls is no different than in North Dakota. See e.g., 81 Fed. Reg. at 2036. The North Dakota court rejected that basis, and EPA should learn from that loss. Consequently, if EPA persists in its unnecessary FIP proposal, EPA must revise its NO_x BART determination to account properly for the "existing controls" in the baseline emissions, BART cost analyses, and BART visibility improvement analyses for the Utah BART Units.

Response: We disagree. Please see our response to the similar comment from PacifiCorp above. We also disagree with the claim that we did not explain our reasons for selecting the baseline we did. Our proposal notice cited our notice for the final Wyoming action, which contained an explanation for why it is not appropriate in this situation to use a post-control baseline.

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[538] By referring to "existing controls" "in use" at a source, the Eighth Circuit employs both the language in Section 169A and 40 CFR 308. *North Dakota*, 730 F.3d at 764. Indeed, whether controls are installed voluntarily or whether such controls are ultimately approved by EPA has no bearing on whether such controls are "existing" or "in use," as neither Section 169A nor 40 CFR 308 list voluntariness or EPA approval status as a factor. Here, EPA makes no attempt to explain its preference for its baseline, except to insist that it must "evaluate control technologies and baseline emissions from the correct starting point, that is, prior to the installation of the combustion controls pursuant to state-law NO_x limitations. As a result, we used the period 2001– 2003 as the appropriate period for baseline emissions, in order to provide a realistic depiction of annual emissions for Hunter Unit 1 prior to installation of combustion controls." 81 FR 2004, 2036. This is arbitrary on its face, as fails to tie its theoretical baseline to the language in the statute and regulation, which does not (and cannot) explain how a pre-installation timeline provides a realistic depiction of existing circumstances, unless EPA's aim is to skew the analysis to disqualify the existing LNB/SOFA controls and associated reductions for purposes of justifying a FIP.

Comment: [UDAQ, pp. 21-22] EPA's refusal to recognize the existing NO_x controls at Utah's BART units is contrary to EPA's past practice. In a previous RH rulemaking in Arizona, EPA said:

The presence of existing pollution control technology is reflected in the BART analysis in two ways: First, in the consideration of available control technologies. . ., and second, in the development of baseline emission rates for use in cost calculations and visibility modeling. . . . AEPCO, APS, and SRP used baseline time periods that varied from 2001 to 2007. The respective baseline emissions and existing pollution control technology used in the BART analyses reflect the levels of control in place at the time. EPA considers ADEQ's approach to be reasonable and generally consistent with the [Regional Haze Rule] and the BART Guidelines.
Arizona Proposed RH Rule, 77 Fed. Reg. 42,834, 42,841 (emphasis added).

Moreover, EPA found that adjusting baseline emissions to account for existing controls was "consistent with the statutory requirement that each BART determination take into consideration 'any existing pollution control technology at the source' . . . in order to 'represent a realistic depiction of anticipated annual emissions for the source' the baseline can account for controls already installed on the source."). 77 Fed. Reg. 72,512, 72,526 (Arizona Final RH Rule).
Thus, EPA's inconsistency is evident. In Arizona, EPA recognized that because it had disapproved Arizona's BART determinations for NO_x, EPA was "obligated to conduct [its] own five-factor BART analyses for NO_x" and included "existing" NO_x controls in the EPA's baseline emissions analysis, including for Cholla. *Id.* Here, contrary to its position in Arizona and Colorado (and for the Cholla and Hayden power plants, which EPA cites in the FIP Proposal as BART comparisons for Hunter and Huntington)[539], EPA ignored existing controls in the development of baseline emission rates. EPA's inconsistencies in applying the baseline emissions methods render its actions arbitrary and capricious. *See Nat. Parks Conserv. Assoc. v. EPA*, 788 F.3d 1134, 1141 (9th Cir. 2015) (citing *Gen. Chem. Corp. v. United States*, 817 F.2d 844, 857 (D.C. Cir. 1987) (per curiam)) ("EPA's actions must also be consistent; an internally inconsistent analysis is arbitrary and capricious.").

Response: We disagree. We respond to similar comments about the Arizona and Colorado actions elsewhere.

Comment: [PacifiCorp, pp. 2, 28] *Illegal treatment of existing controls.* EPA failed to properly consider existing controls by calculating a baseline emissions rate that did not include previously installed combustion controls. This flawed baseline emissions rate led to incorrect and inflated cost and visibility data that EPA cannot rely on to implement its FIP Proposal.
EPA incorrectly claims that it properly considered the existing combustion controls (LNB and SOFA) at Hunter Unit 1 as required by the BART statute and BART Guidelines. See 81 F R at 2034. Rather, as EPA begrudgingly admits, it evaluated "control technologies and baseline

[539] 81 FR 2004, 2037-38.

emissions" from what it mistakenly claims is the "correct starting point, that is, prior to the installation of the combustion controls pursuant to state-law NO_x limitations." Id. at 2036.[540] In other words, while EPA may have noted the presence of the existing controls when identifying the types of potential BART NO_x controls, **EPA did not take into account the impact of the existing controls** when actually conducting the statutorily-required BART cost and visibility analyses for Hunter Unit 1, including establishing the baseline emissions to be used in the cost and visibility analyses. **EPA made this same mistake for all of the Utah BART Units.** 81 FR at 2038-40, tbls. 19-24, (Hunter Unit 2); 81 FR at 2042-44 tbls. 25-30 (Huntington Unit 1); 81 FR at 2046-48, tbls. 32-36 (Huntington 2).

EPA's refusal to properly account for "existing controls" violates the CAA and BART Guidelines, and skews EPA's BART analysis. As EPA also is well aware, the Eighth Circuit Court of Appeals found that EPA's similar actions in North Dakota (ignoring existing controls when conducting a BART "cost" analysis) violated the CAA. Finally, EPA took a contrary position for one of PacifiCorp's units in Arizona (Cholla Unit 4, which EPA uses as a comparable benchmark here), making EPA's actions here overtly arbitrary and capricious.

Response: EPA disagrees with this comment. We respond to comments about the Eighth Circuit opinion and the Cholla action in detail elsewhere. Our impacts analysis did take into account the LNB/SOFA by using the lower NO_x rate that resulted from LNB/SOFA to determine cost-effectiveness for SNCR and SCR. Furthermore, our BART determination considered the cost-effectiveness and visibility benefits of SCR + LNB/SOFA relative to the LNB/SOFA. Because the cost-effectiveness of SCR + LNB/SOFA relative to LNB/SOFA is reasonable and the visibility benefits are large, we disagree that our use of the pre-combustion control baseline skewed our BART determination.

Comment: [PacifiCorp, p. 29] *The CAA and BART Guidelines Require EPA to consider "existing controls."* – The language of the regional haze statute is unambiguous; a State/or EPA determining BART must take account of "any existing pollution control technology in use at the source[.]" 42 U.S.C. § 7491(g)(2). The statute is clear. It does not allow EPA to consider "existing controls" for some limited purposes, but ignore them for other important analyses. For example, when conducting a five-factor BART determination, the State/or EPA must determine the "realistic" baseline emissions so that accurate BART cost and visibility analyses can be performed. The BART Guidelines state "[t]he baseline emissions should represent a *realistic* depiction of *anticipated* annual emissions for the source. In general, for the existing sources

[540] EPA also emphasizes that it "did not approve" the existing NO_x pollution controls. However, the courts, see North Dakota, have held this issue is irrelevant. Moreover, here, where EPA did not act on Utah's regional haze SIP for years, it is disingenuous for EPA to claim it did not approve the controls when EPA withheld its approval/disapproval for years beyond the statutory time frame. In 2008, Utah submitted to EPA a RH SIP containing Utah's BART analyses for PacifiCorp's four BART-eligible units located in Utah, identifying the currently-installed "existing controls" as BART. EPA took no formal action with regard to this 2008 RH SIP, or on a minor 2011 revision (which did not materially alter or modify the 2008 BART determinations), until EPA proposed partial disapproval of the 2011 RH SIP revision on May 16, 2012. By then, Utah's RH SIP was legally binding and PacifiCorp was legally required to install the controls.

subject to BART, you will estimate the anticipated annual emissions based upon actual emissions from a baseline period." 40 C.F.R. pt. 51, app. Y § IV.D.4.d. (emphasis added).
Here, despite claiming it considered "existing controls," EPA refused to account for the "existing controls" when setting the baseline emissions, a fundamental part of a BART analysis. Instead, EPA used a baseline emission rate founded on 2001-2003 data which did not account for the "existing controls." Moreover, EPA's use of 2001- 2003 emissions data to establish the baseline emissions for the Utah BART Units is neither "realistic" nor provides the "anticipated" emissions as required by the BART Guidelines. Using outdated emissions information is not "realistic;" it does not reflect reality at all. For example, the 2001-2003 NO_x emissions rate for Hunter 1 was 0.40 lb/MMBtu. 81 FR at 2004, 2034, tbl. 13. After the installation of pollution control equipment in 2014, the actual NO_x emissions rate changed to 0.21 lb/MMBtu, a 48.4% decrease. *Id.* at 2034. Therefore, the old 2001-2003 emissions data is no longer "realistic," and represents approximately half of the actual, realistic emissions rate. Moreover, EPA cannot use outdated emissions data to "anticipate" annual emissions from the Utah BART Units because the NO_x emissions rates, in fact, have materially changed. This mistake skews EPA's BART decision-making.

Response: We disagree. First, the comment does not provide any textual or structural analysis for its assertion that the statute is "clear." Instead, the statute is silent about whether "consideration" of existing controls means including them in the baseline.
We start with the text of the statute. To "consider" is to "[t]hink carefully about (something), typically before making a decision," particularly to "[t]ake (something) into account when making a judgement."[541] The word "consider" does not specify the particular way in which the item must be taken into account or thought about carefully. Thus, the word "consider" is ambiguous with respect to the issue of whether existing controls must be included in the baseline.

As the statute is silent on how to take into consideration existing controls, under *Chevron U.S.A. v. NRDC*, 467 U.S. 837, 843-44 (1984), this silence creates a gap for EPA to fill. In other words, Congress left to EPA's discretion the manner in which existing controls are to be considered, and if the manner EPA chooses is reasonable, then that manner is permissible. Below, we explain why not including these particular combustion controls in the baseline is reasonable, and why it is consistent with the BART Guidelines. We explain elsewhere how we considered the combustion controls in other ways, and why that approach is reasonable and consistent with the statute and BART Guidelines.

We disagree that our approach to baseline emissions is inconsistent with the BART Guidelines. As quoted by commenter, the Guidelines state: "[t]he baseline emissions should represent a realistic depiction of anticipated annual emissions for the source. In general, for the existing sources subject to BART, you will estimate the anticipated annual emissions based upon actual emissions from a baseline period." 40 C.F.R. pt. 51, app. Y § IV.D.4.d.

[541] http://www.oxforddictionaries.com/definition/english/consider

The comment is mistaken in stating that our baseline is not realistic and does not anticipate emissions from Hunter and Huntington. Until EPA approves a SIP or promulgates a FIP that requires PacifiCorp to operate these combustion controls at Hunter and Huntington, for purposes of the Clean Air Act PacifiCorp is free to choose to not operate them or remove them. While PacifiCorp may be temporarily bound by state law to operate them, until that state law is approved into the SIP Utah can change that state law outside the processes of the Clean Air Act. Thus, for purposes of the Clean Air Act and BART, it can be realistically anticipated that Hunter and Huntington will emit at levels commensurate with the baseline we used. While the commenter might object that "realistically" no owner or operator would remove or fail to operate combustion controls once they are installed, for purposes of a SIP we must look at what the federally enforceable requirements are in order to anticipate what future behavior might be. While the BART Guidelines allow states or EPA to adjust baseline emissions to take into account projections of "future operating parameters" by making such assumptions into enforceable limits, *id.* at IV.D.4.d.2, the BART Guidelines are silent as to how reductions resulting from the post-baseline installation of controls should be treated. One way to take account of such reductions is to update the baseline, as we did in our regional haze actions for Arizona and Montana. In those rulemakings, we determined that updating the baseline was appropriate because several sources had recently installed combustion controls to comply with consent-decree obligations and acid-rain requirements, while another source had changed its coal supply. The fact that these controls were installed to comply with other CAA requirements heavily informed EPA's decision to update the sources' baseline emissions. The concern expressed above, that emission reductions based only on state law could not be relied on for CAA purposes, did not exist. As we explained in our Arizona action, "an updated baseline' might not be appropriate in all instances. For instance, if it appeared that controls had been installed early in order to avoid a more stringent BART determination, it would presumably not be appropriate to use a baseline representing these new controls." 72 FR 72526.

Thus, by their very nature, baseline emissions should be "a realistic depiction of anticipated annual emissions" *before* the installation of BART. While baseline emissions can take into account newly installed controls and in some cases future operating parameters, baseline emissions still must represent a pre-BART scenario so that the cost-effectiveness and visibility benefits of all potential BART control options can be evaluated from a consistent benchmark. Indeed, it would make no sense for EPA to update the commenters' baseline emissions to incorporate emission reductions that they admittedly achieved to comply with BART. Doing so would bias EPA's analysis of additional control options by giving the commenters credit for emissions reductions attributable to BART, but treating the costs they incurred to achieve those reductions as if they had never occurred.

Given these considerations, our interpretation of the BART Guidelines is neither plainly erroneous nor inconsistent with the Guidelines, and warrants deference. See *Auer v. Robbins*, 519 U.S. 452 (1997). To the extent that the commenter challenges the BART Guidelines as inconsistent with the statute, that challenge is time-barred under CAA section 307(b)(1)), and in any case as we explain above the statute is ambiguous with respect to how to consider existing controls, and EPA's interpretation is reasonable.

Comment: Citing subsection (3) of Section 169 of the CAA, which considers the "existing pollution control technology in use." The State has demonstrated quantitatively through monitoring data improvements in Sulfur Dioxide (SO_2), NO_x, and PM_{10}.

Response: This comment does not provide sufficient detail for us to provide a response. Please see our responses elsewhere to comments on the BART factor for existing pollution control technology in use at the source.

j. Other Comments on BART

Comment: [EE, pp. 8-9] If the owners of affected units addressed by the Utah SIP revisions are required to install BART controls at these units, it must be assumed that these units will continue to operate at least 20 additional years at their current output. EPA itself uses this 20-year assumption in the calculation of the useful life of control equipment to determine the cost effectiveness of such controls at a cost of more than one-half billion dollars. *See id.* at 2037. However, if the BART Alternative is approved, the owner of these units, the State of Utah, and the EPA could more freely assess future reasonable progress requirements under the Regional Haze Rule, as well as potential carbon dioxide (CO2) emissions reduction compliance obligations for these existing electric generating units under the Clean Power Plan (CPP), including the potential for reduced utilization. In fact, if EPA does not consider the potential for reduced utilization under the CPP, the dollars-per-ton calculations used to justify installation of selective catalytic reduction could be significantly understated. While the CPP currently is stayed, EPA, the State of Utah, and the unit owner must continue to consider both the long-term visibility improvements as well as CO2 emissions reductions that could be achieved under various compliance scenarios in subsequent compliance timeframes. Accordingly, EPA should not foreclose potential visibility benefits and emissions reductions by requiring the installation of additional controls at this time. In addition to the clear visibility benefits provided under the BART Alternative, these longer-term considerations militate in favor of approving the Utah SIP in its entirety. Further, this would be consistent with other EPA action on regional haze—in which the Agency has recognized the need for states and affected companies to have more time to plan their future environmental strategies: the soon-to-be-released proposed rule that would give states several more years to plan the next round of regional haze reasonable progress actions.[542]

Response: As a preliminary matter, and as was noted in the comment, the final CPP has been stayed by the Supreme Court. As a result, EPA is neither implementing nor enforcing the CPP, and states are not obligated to submit a 111(d) state plan during the stay. Because the requirements of the CPP are stayed at this time, and Utah has not yet submitted a section 111(d) plan for the CPP, it is unreasonable and speculative for EPA to consider potential impacts and

[542] *See* Protection of Visibility: Amendments to Requirements for State Plans, http://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201510&RIN=2060-AS55.

compliance considerations regarding the stayed program as the commenter suggests. In the meantime, we are obligated under the RHR to move ahead with finalizing the FIP.
We acknowledge that the issues raised are important to the owners of an EGU and its customers. We received many comments on the Proposed Clean Power Plan (CPP) regarding requirements under the RHR (see Response to Comments Chapter 7 in the CPP docket EPA-HQ-OAR-2013-0602). The final CPP does not preclude actions taken pursuant to CAA section 111(d) requirements to satisfy other CAA program requirements, such as those required under the RHR. In the currently stayed CPP, the EPA provides considerable flexibility for states and sources under the final 111(d) emission guidelines to address the potential for stranded assets. The EPA has experience working with states to account for these types of changed circumstances and will continue to work with states to explore options for integrating compliance requirements. While the commenter correctly notes that the CPP states that BART alternatives could mitigate the potential for stranded assets, we note here that the controlling action here is the RHR rather than the CPP. The RHR does not require EPA or states to consider CPP impacts to be taken into account and this action is limited to a determination of whether the BART Alternative would provide greater reasonable progress than BART.

Under the BART Guidelines, a short useful life should be based on definite knowledge of a shutdown, which we do not have in this case. The FIP does not necessitate that the source operate for 20 additional years. After the FIP is in place, but before the compliance deadline, the source owner or the state can request a revision of the FIP or a new SIP can be submitted that takes into account a shorter useful life if that is enforceable and meets applicable requirements.

Comment: [UAMPS, p. 8] Uncertainty Regarding the Clean Power Plan Reinforces Approving the Revised SIP EPA also improperly ignored the potential significant cost impact of the Clean Power Plan. EPA does not even once mention the Clean Power Plan in its Proposed Action or its potential impact on the BART determinations contained in the FIP. EPA arbitrarily ignores the uncertainty posed by the Clean Power Plan when considering the remaining useful life and cost of compliance factors. While EPA should not even be proposing the FIP, as discussed, *infra,* the FIP is also arbitrary and capricious for EPA's failure to adequately conduct a BART determination for Hunter by giving adequate consideration to the remaining useful life and cost of compliance factors. EPA's failure to adequately consider the remaining useful life and cost of compliance factors is highly problematic and is the hallmark of an administrative agency overlooking key aspects of a regulatory issue. The underlying premise to justify the installation of selective catalytic reduction ("SCR") controls at Hunter rests on the assumption that SCRs will be amortized over a twenty-year period. This assumption means the Hunter Plant will remain operational twenty years after the proposed installation date (2021) for SCR controls at Hunter-meaning the Hunter Plant will need to remain operational until 2041 to justify the installation of these pollution control under EPA's BART analysis. This assumption can only be made in a regulatory vacuum outside of the practical realities of what it means to own, operate, and most importantly make investment decisions at a coal-fired plant. In this case, EPA disregards its own directive on how Clean Power Plan compliance should consider the interrelation between other Clean Air Act regulatory programs, namely the Regional Haze Program.

EPA, in its final rule for the Clean Power Plan, notes the important nexus between how Regional Haze SIPs will impact affected EGUs under the CPP.[543] While the EPA is providing considerable flexibility for states and sources under the final lll(d) emission guidelines, the EPA acknowledges the possibility that some sources could ultimately be faced with the potential for stranded assets as a result of state lll(d) plans. For these sources, however, states have the option of developing BART alternatives that replace control requirements that would otherwise result in stranded assets at a particular EGU with the aggregate emission reductions that will result from retirements, fuel switching, reduced utilization, or lesser controls at multiple EGUs. The EPA states it will continue to work with states to explore options for integrating compliance requirements across multiple regulatory programs, as warranted.[544] Utah did exactly as EPA suggests in adopting the Utah BART Alternative, which achieves greater reasonable progress while minimizing stranded asset potential associated with installing more costly BART controls, such as the SCRs suggested by EPA in its FIP. Decreased utilization of the State's BART eligible sources due to Clean Power Plan compliance, including Hunter, would significantly change the cost-effectiveness determination required when making the BART determination to justify the FIP requiring the installation of SCRs. No considered of decreased utilization was made in EPA's BART determination for the FIP. EPA, without any explanation of the potential impact of Clean Power Plan compliance, merely relied upon the twenty-year remaining useful life assumption (the default assumption under the Regional Haze rules) used in PacifiCorp's 2012 BART determinations, which were made prior to the advent of the Clean Power Plan.[545] EPA's reliance on the twenty-year remaining useful life factor is misplaced, because, as noted above, the EPA must go a step further in its analysis of the remaining useful life factor when proposing the FIP to consider how drastic the impact would be from the Clean Power Plan. Rather than acknowledging its own directive for "integrating compliance requirements" between the Regional Haze Program and the Clean Power Plan, EPA simply relies on the default twenty-year useful life assumption and ignores its own directive to consider integrating compliance requirements between these two programs. EPA provides no recognition to the fact that the Clean Power Plan, when implemented, may result in reduced utilization, which, in turn, will dramatically alter the cost of compliance associated with the installation of SCRs for Hunter as proposed in its FIP.

Response: As a preliminary matter, and as was noted in the comment, the final CPP has been stayed by the Supreme Court. As a result, EPA is neither implementing nor enforcing the requirements of the CPP, and states are not obligated to submit a 111(d) state plan during the stay. Because the requirements of the CPP are stayed at this time, and Utah has not yet submitted a section 111(d) plan for the CPP, it is unreasonable and speculative for EPA to consider potential impacts and compliance considerations regarding the stayed program as the commenter suggests. In the meantime, we are obligated under the RHR to move ahead with finalizing the FIP.

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[543] 80 FR 64923 (Oct. 23, 2015)
[544] Id.
[545] 81 FR 2040.

We acknowledge that the issues raised are important to the owners of an EGU and its customers. We received many comments on the Proposed Clean Power Plan (CPP) regarding requirements under the RHR (see Response to Comments Chapter 7 in the CPP docket EPA-HQ-OAR-2013-0602). The final CPP does not preclude actions taken pursuant to CAA section 111(d) requirements to satisfy other CAA program requirements, such as those required under the RHR. As the commenter points out, in the currently stayed CPP, the EPA provides considerable flexibility for states and sources under the final 111(d) emission guidelines to address the potential for stranded assets. The EPA has experience working with states to account for these types of changed circumstances and will continue to work with states to explore options for integrating compliance requirements. While the commenter correctly notes that the CPP states that BART alternatives could mitigate the potential for stranded assets, as described previously, the controlling action here is the RHR rather than the CPP. The RHR does not require EPA or states to consider CPP impacts to be taken into account and as described in greater detail in the preamble, EPA is disapproving the BART Alternative on its own merits.

Under the BART Guidelines, a short useful life should be based on definite knowledge of a shutdown, which we don't have in this case. The FIP does not necessitate that the source operate for 20 additional years. After the FIP is in place, but before the compliance deadline, the source owner or the state can request a revision of the FIP or a new SIP can be submitted that takes into account a shorter useful life if that is enforceable.

Comment: [Conserv Orgs -- Stamper Report, p. 31]
Potential Impacts of EPA's Proposed Clean Power Plan Rule on Cost Effectiveness Analyses. In a draft BART analysis developed by Utah before adoption of its BART alternative, Utah indicated the EPA's proposed Clean Power Plan might necessitate a reduction in each of the BART-subject units' electrical generation and capacity factor by 23.9%, and such lower capacity factor would result in less tons of NO_x removed and thus higher cost effectiveness values.[546] Assuming the Clean Power Plan is upheld by the Courts and is implemented, it is not a reasonable assumption to assume that each of the BART-subject units (and presumably all other coal-fired power plants) will operate at significantly reduced capacity factors. It is not typically cost effective for coal-fired power plants to operate at significantly reduced capacity factors. Such operation would essentially require an EGUs to operate as "peaking units" or "cycling units." In fact, operation of coal-fired units as peaking or load cycling units will probably increase the amount of greenhouse gases emitted per MW-hr because it is more efficient in terms of fuel use (and thus emissions) to operate a coal-fired unit as a base-loaded unit.[547] Operating a coal-fired power plant at loads significantly lower than maximum load also decreases plant efficiency, resulting in greater greenhouse gases per unit of electricity generated.

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[546] *See* Utah Division of Air Quality, Staff Review of 2008 Best Available Retrofit Technology (BART) Determination, September 12, 2014 at 21-23.
[547] *See* U.S. EPA, Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Coal-fired Electric Generating Units, October 2010, at 23. (Ex. 24)

What is more likely to occur under the Clean Power Plan than curtailments in each coal-fired unit's capacity factor is the complete shutdown of a coal-fired unit and/or the conversion to a natural gas-fired unit. In fact, a recent news story indicated that the owners of the Intermountain Power Plant may be considering replacing its coal units with natural gas-fired units.[548] In the 2005 baseline year for the proposed Clean Power Plan, the Intermountain Power Plant was the largest emitter of carbon dioxide of all of the other power plants in Utah. Its greenhouse gas emissions accounted for 39% of the total carbon dioxide emitted by coal-fired EGUs that report to EPA's Clean Air Markets Database.

Thus, it is not appropriate or reasonable to consider the impacts of the proposed Clean Power Plan on cost effectiveness of the controls being evaluated to meet BART.

Response: The commenter raises several important issues regarding the interaction of the CPP and RHR. It should be noted, however, that the CPP has been finalized and is not "proposed" as the commenter states. At this point in time, the final CPP has been stayed by the Supreme Court and implementation and enforcement are on hold while the stay is in place. Additionally, while the overall 32% CO_2 emission reduction goal for the CPP in 2030 is in comparison to 2005 levels, EGU emissions data from the year 2012 were used to set state goals and is often referred to as the baseline year.

In the CPP final 111(d) emission guidelines, the EPA acknowledges the possibility that some sources could ultimately be faced with the potential for stranded assets. The EPA provides considerable flexibility for states and sources under the final CPP 111(d) emission guidelines to address the potential for stranded assets. These include, but are not limited to, fuel switching, reduced utilization, trading mechanisms, phased-in reductions, and other approaches. If the stay is lifted and the state chooses to submit a plan to meet the requirements of the CPP, it is up to the state to choose how to meet their goals, and it is not appropriate for EPA to speculate how any individual EGU may comply with CPP requirements.

Comment: The US Chamber of Commerce' document: "EPA's New Regulatory Front: Regional Haze and the Takeover of State Programs", William Yeatman, 2012, found here: https://www.uschamber.com/sites/default/files/legacy/reports/1207_ETRA_HazeReport_lr.pdf, alleges, that the EPA is using the Regional Haze rule to push an agenda designed to "Shut down Coal." This scheme has been used in other states with no discernable visibility improvement, despite $100's of millions of dollars in retrofits. This document is illustrative of the miniscule benefit this scheme has demonstrated. I would like to see the allegations by the US Chamber of Commerce answered by the EPA.

Response: EPA is statutorily obligated under the CAA to implement the Regional Haze program, including the requirement for BART. We do not exercise this duty as a matter of discretion with the intent to "shut down coal". The allegations contained in the Chamber of

[548] May 24, 2014, Utah power plant looks to natural gas to fuel the future, KSL TV, available at http://www.ksl.com/?sid=29195273.

Commerce document are generic to the Regional Haze program, and not specific to this rulemaking. Accordingly, we do not respond to that report here.

Comment: [Conserv Orgs -- Stamper Report, pp. 60-62]

EPA Should Set the NO_x ***BART Limit at 0.05 lb/MMBtu on a 30-Day Average.***

Despite evaluating LNB/OFA/SCR to meet a NO_x rate of 0.05 lb/MMBtu, EPA has proposed a NO_x BART limit for each of the BART-subject units of 0.07 lb/MMBtu that would apply on a 30-day rolling average basis. EPA proposed a 0.07 lb/MMBtu limit to provide a margin of safety for the limit that would apply at all times, including startup, shutdown, and malfunction. However, such a margin of safety for a rolling 30-day average limit is not necessary.
There are several EGUs that have achieved NO_x emission rates of 0.05 lb/MMBtu or lower with SCR. In its response to comments on its NO_x BART finding for the San Juan Generating Station, EPA found significant support in actual emissions data to on which to base its finding that a 0.05 lb/MMBtu NO_x limit was achievable on a 30-boiler operating day average basis, including a study that identified 25 units that are achieving NO_x emission rates less than 0.05 lb/MMBtu on an hourly basis.[549] EPA also cites to NO_x emission rates at Seminole Units 1 and 2 (achieving 0.04 lb/MMBtu), Morgantown Units 1 and 2 (achieving 0.043 to 0.054 lb/MMBtu)[550], Trimble Unit 1 (achieving 0.032 lb/MMBtu), Cope Generating Station (achieving 0.032 lb/MMBtu), as well as the Mountaineer plant and Cliffside Unit 5.[551] EPA also analyzed emissions data for the lowest NO_x emitting units to calculate rolling 30-day averages (on both a calendar year basis and on a 30-boiler operating day basis).[552] EPA found several units emitting NO_x at or below 0.05 lb/MMBtu, including Havana Unit 9, Parish Unit 7, and Parish Unit 8.[553]

While most recently installed SCR systems have been designed to meet 90% NO_x control, many units are not routinely operated to meet that level of control because the units operate under the CAIR/CSAPR emissions trading program that do not specify unit-specific emission limits. Because there are operational expenses with operating an SCR year-round and/or operating the SCR to consistently achieve the lowest emission rate, one would not expect such units to consistently achieve the lowest NO_x emission rates achievable at the unit in the absence of an enforceable emission limit requiring the unit to meet the lowest NO_x emission rates. Therefore, in evaluating the most stringent level of NO_x control achievable, it is valuable to evaluate the

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[549] *See* U.S. EPA, Complete Response to Comments for NM Regional Haze/Visibility Transport FIP, EPA-R06-OAR-2010-0846-0127 at 53 (Ex. 48). EPA also cites to: Clay Erickson, et al., What's New in SCRs, DOE's Environmental Control Conference, May 16, 2006, at 28. Available at: http://www.netl.doe.gov/publications/proceedings/06/ecc/pdfs/Licata.pdf; LG&E Energy, Selective Catalytic Reduction: From Planning to Operation, Competitive Power College, Dec. 2005, at 28. (Ex. 49); and M.J. Oliva and S.R. Khan, Performance Analysis of SCR Installations on Coal-Fired Boilers, Pittsburgh Coal Conference, Sept. 2005 (Ex. 50).
[550] Morgantown Unit 2 has consistently emitted NO_x at 0.05 lb/MMBtu on a 30-boiler operating day average basis since June 2010. *See* Morgantown Unit 2 30-BOD Average NO_x Rates, June 2010 to June 2013 (Ex. 51).
[551] *See* U.S. EPA, Complete Response to Comments for NM Regional Haze/Visibility Transport FIP, EPA-R06-OAR-2010-0846-0127, at 53-54 (Ex. 48).
[552] *Id.* at 56, 58.
[553] *Id.*

NO_x emitted from new units with unit-specific best available control technology (BACT) limits specified in a prevention of significant deterioration (PSD) permit.

For example, the JK Spruce Unit 2 plant in Texas, equipped with low NO_x burners, overfire and SCR, began operating in 2010 under a PSD permit. The unit is subject to a 0.069 lb/MMBtu NO_x limit on a 30-day rolling average and a 0.05 lb/MMBtu limit on a 12-month rolling average basis.[554] A review of 30-boiler operating day NO_x emission rates for the unit from April 2010 through June 2013 shows that the maximum 30-boiler operating day average NO_x emission rate was 0.05 lb/MMBtu.[555]

The Dry Fork plant in Wyoming, which is equipped with low NO_x burners, overfire air and SCR, is subject to a 0.05 lb/MMBtu limit on an annual average basis in its PSD permit as discussed above.[556] The Dry Fork unit began operating in mid-2011. Based on a review of 30-lb/MMBtu on a 30-boiler operating day NO_x emission rates, the unit has never emitted NO_x higher than 0.04 boiler operating day average basis.[557]

The Newmont Nevada TS power plant, which is also equipped with low NO_x burners, overfire air, and SCR and burns Wyoming coal, is subject to a 0.067 lb/MMBtu limit based on a rolling 24-hour period.[558] A review of 30-boiler operating day NO_x emission rates for this unit from July 1, 2008 through June 30, 2013 shows that the maximum 30-boiler operating day average NO_x emission rate from this unit over 5 years of operation was 0.05 lb/MMBtu.[559]

All of this long term, actual emissions data for units equipped with SCR shows that those units with unit-specific emission limits that are more closely linked to the capabilities of the unit's NO_x pollution controls consistently have met levels of NO_x emissions at or below 0.05 lb/MMBtu.

EPA has provided any detailed technical justification for its proposed 0.07 lb/MMBtu 30-day average NO_x limits of its proposed BART FIP. Based on the analyses described above and associated exhibits, the Hunter and Huntington units should readily be able to achieve a 0.05 lb/MMBtu NO_x limit on a rolling 30-day average basis.

Response: We disagree that an emission limit of 0.05 lb/MMBtu on a 30-day rolling average basis, as opposed to the 0.07 lb/MMBtu on a 30-day rolling average emission limit established

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[554] *See* JK Spruce Permit, Permit Numbers 70493 and PSD-TX-1037, Special Conditions, at 2 (Ex. 52).
[555] *See* NO_x emission rate data for Spruce Unit 2 (Ex. 53).
[556] *See* In the Matter of a Permit Application (AP-3546) From Basin Electric Power Cooperative to Construct a 385 MW Pulverized Coal Fired Electric Generating Facility to be Known as Dry Fork Station (Permit No. CT-4631), October 15, 2007, at 6 (Ex. 54).
[557] *See* Dry Fork 30 BOD Average NO_x Rates, 2011-2012 (Ex. 55).
[558] *See* Nevada Bureau of Air Pollution Control, Class I Air Quality Operating Permit to Construct, Newmont Nevada TS Power Plant, No. AP4911-1349, Section V.A.2.a.(11). (Ex. 56).
[559] *See* Newmont Nevada TS Power Plant 30-BOD Average NO_x Rates, July 2008 to June 2013 (Ex. 57).

by EPA is warranted for the Utah BART EGUs. Emission limits associated with BART do not need to meet the lowest emission rate achieved with that technology at any coal-fired power plant, but are instead determined on a case-by-case basis. The RHR provides that: ''The determination of BART must be based on an analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each BART-eligible source that is subject to BART.'' 40 CFR 51.308(e)(1)(ii)(A). In determining the controlled emission level, EPA must consider emission rates that are practically achievable in light of routine variations in operation and understanding that the SCR must be designed to maintain emissions below the required limit.

Additionally, the BART Guidelines state that: ''[i]n assessing the capability of the control alternative, latitude exists to consider special circumstances pertinent to the specific source under review, or regarding the prior application of the control alternative'' (40 CFR Part 51, Appendix Y, section IV.D.3) and that ''[t]o complete the BART process, you must establish enforceable emission limits that reflect the BART requirements''. (40 CFR Part 51, Appendix Y, section V). The five factor BART analysis described in the Guidelines is a case-by-case analysis that considers site-specific factors in assessing the best technology for continuous emission controls. After a technology is determined as BART, the BART Guidelines require establishment of an emission limit that reflects the BART requirements, but does not specify that the emission limit must represent the maximum level of control achieved by the technology.

In our proposed rule, we explained that we assumed an annual emission rate of 0.05 lb/MMBtu for the purpose of conducting BART analyses. This emission rate was based on our finding that SCR can achieve performance emission rates as low as 0.04 to 0.07 lb/MMBtu on an annual basis. Our assumed annual emission rate of 0.05 lb/MMBtu is on the lower end of this range, and therefore reflects a somewhat conservative assumption. We then translated the assumed annual emission rate used for analysis purposes into a 30-day emission limit of 0.07 lb lb/MMBtu to be used for compliance. This required that we take into account the shorter averaging period of the emission limit, the requirement that the emission limit apply at all times, including during start-up, shutdown, and malfunction, and that some margin be provided to ensure compliance.

While the BART Guidelines and the RHR do not preclude selection of the maximum level of control achieved by a given technology as BART, the emission limit set to reflect BART must be determined based on a consideration and weighting of the five statutory BART factors. Therefore, limits set as BACT during PSD review, or emission rates achieved from the operation of individual facilities under an emissions trading program (e.g., the CSAPR) may provide important information, but should not be construed to automatically represent the most appropriate BART limit for a given technology.

Moreover, if anything, two of the three PSD BACT emission limits cited by the commenter seem to validate the BART emission limits set by EPA for the Utah units. The 30-day rolling average emission limit for the JK Spruce Unit 2 plant in Texas of 0.069 lb/MMBtu is nearly identical to the 0.07 lb/MMBtu limit set by EPA for the Utah BART EGUs, varying by only 0.001 lb/MMBtu, or 1.4%. This very small difference is trivial and the emission limits are essentially

the same. Similarly, the annual emission limit for the Dry Fork plant in Wyoming of 0.05 lb/MMBtu, compares very favorable to that set by EPA for Utah BART EGUs when taking into consider the much longer averaging period (i.e., annual vs. 30 days). That is, if the annual limit for Dry Creek were instead expressed on a 30-day averaging period, it would be necessarily higher and likely close to the 0.07 lb/MMBtu limit set by EPA.

Comment: [NPS Tech, p. 2] Of 1,222 plants, EPA Clean Air Markets (CAM) data for 2014 rank the Hunter facility #27 for NO_x at 11,595 tons. On an emission per unit of electrical output basis, Hunter ranked #188 worst for SO_2 and #197 worst for NO_x. Hunter also ranked #273 for emissions of CO2 per unit of electricity produced.

Response: Comment noted.

Comment: [NPS Tech, p. 2] Of 1,222 plants, CAM data for 2014 rank the Huntington facility #72 for NO_x at 6,864 tons. On an emission per unit of electrical output basis, Huntington ranked #233 worst for SO_2 and #235 worst for NO_x. Huntington also ranked #309 for emissions of CO2 per unit of electricity produced.

Response: Comment noted.

Comment: [Conserv Orgs, p. 18] SCR Constitutes BART for NO_x Emissions From Hunter Units 1 and 2 and Huntington Units 1 and 2 The Conservation Organizations support EPA's co-proposal finding that SCR constitutes BART for NO_x emissions from Hunter Units 1 and 2 and Huntington Units 1 and 2. Not only does EPA's five-factor BART analysis support SCR as BART—predicting some of the most significant visibility improvements at some of the lowest costs estimated across the Regional Haze Program—but the Conservation Organizations' own analyses validate EPA's.

Response: Comment noted.

5. General

a. Economic and Employment Concerns

Comment: [Carbon County, pp. 1 and 2] Carbon County is most concerned that, based on testimony from the Navajo tribe with a population of 166,826, how the loss of nearly 1,000 jobs between the plant and the mine would be too great of an impact to the tribe. Yet the loss of 1,260 direct and 1,850 indirect jobs between the mines and power plants and our supporting businesses in the Carbon/Emery County area with a combined population of 31,737 somehow does not measure up to a major economic impact to the area and our citizens? Why has no testimony been taken on the impacts to our area? How can EPA's conclusion, given the facts of this action, not be interpreted as Federal discrimination?

Response: It is not EPA's intention to endanger the economic viability of the PacifiCorp BART units or to place an undue burden on PacifiCorp's customers in making our final FIP determinations. However, neither the CAA nor the RHR provide for consideration of the affordability of controls, ratepayer impacts or potential job losses as part of a BART determination analysis. Rather, they require consideration of "the costs of compliance, the energy and non-air quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology."[560]

It is not clear which action the commenter is referring to in discussing testimony from the Navajo Nation. EPA has recently promulgated two source-specific FIPs to implement the RHR for sources on Navajo Nation – one for Four Corners Power Plant[561] and one for Navajo Generating Station.[562] The legal and policy context for those actions differed significantly from the instant case. In particular, in promulgating FIPs in Indian Country, EPA was acting in part, under the Tribal Authority Rule,[563] which provides additional flexibility not otherwise available under the CAA and RHR.[564] In addition, in undertaking the Four Corners Power Plant and Navajo Generating Station actions, EPA engaged in consultation with tribes and tribal authorities, consistent with the federal trust responsibility to Indian tribes, Executive Order 13175: Consultation and Coordination With Indian Tribal Governments, and the *EPA Policy on Consultation and Coordination with Indian Tribes* (May 5, 2011).[565] As part of that consultation, EPA undertook certain economic analyses to assess potential rate impacts to the Navajo Nation and other affected tribes.[566] No such potential impacts to tribes have been identified in the current case.

The commenter appears to misunderstand that an analysis of "non-air quality environmental impacts" must include economic effects. In fact, the plain language of the statute, as well as the RHR, makes clear that the economic effects factor is limited to non-air quality environmental impacts.[567] The BART Guidelines note that examples of such impacts would include "solid or hazardous waste generation and discharges of polluted water from a control device."[568] Additionally, the BART Guidelines do allow for (but do not require) the consideration of "significant economic disruption or unemployment" as part of "energy impacts." Specifically, the Guidelines provide that:

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[560] CAA section 169A(g)(2), 42 U.S.C. 7491(g)(2); 40 CFR 51.308(e)(1)(ii)(A).
[561] 77 FR 51620.
[562] 79 FR 46514.
[563] 40 CFR part 49
[564] *See* 79 FR 46517 – 46518.
[565] Available at: https://www.epa.gov/sites/production/files/2013-08/documents/cons-and-coord-with-indian-tribes-policy.pdf
[566] *See*, e.g. 77 FR 51625 – 51626, 79 FR 46548-46549
[567] Id.
[568] BART Guidelines section IV.D.4.h

> * * * the energy impacts analysis may consider * * * whether a given alternative would result in significant economic disruption or unemployment. For example, where two options are equally cost effective and achieve equivalent or similar emissions reductions, one option may be preferred if the other alternative results in significant disruption or unemployment.[569]

The Guidelines also allow for consideration of "affordability" as part of the "costs of compliance" under certain circumstances:

> 1. Even if the control technology is cost effective, there may be cases where the installation of controls would affect the viability of continued plant operations.
>
> 2. There may be unusual circumstances that justify taking into consideration the conditions of the plant and the economic effects of requiring the use of a given control technology. These effects would include effects on product prices, the market share, and profitability of the source. Where there are such unusual circumstances that are judged to affect plant operations, you may take into consideration the conditions of the plant and the economic effects of requiring the use of a control technology. Where these effects are judged to have a severe impact on plant operations you may consider them in the selection process, but you may wish to provide an economic analysis that demonstrates, in sufficient detail for public review, the specific economic effects, parameters, and reasoning.[570]

Thus, only under "unusual circumstances" where a potential control option is expected to have a "severe impact on plant operations" or "result in significant economic disruption or unemployment" can we consider economic effects as part of a BART determination. In this case, we lack evidence to support the assertions that our proposed FIP would result in significant rate increases, jeopardize the plant's operations, or result in any other economic effects. In the absence of such evidence, commenter's assertions regarding job losses are speculative, and we cannot consider them as part of our BART determination.

Comment: **[Carbon County, p. 2]** We see this proposed rule as a way to control lands around Monuments, National Parks Wilderness areas or any area deemed necessary by the EPA or the governing Administration with the purpose of reducing the productivity of goods or resources which devalues the area creating catastrophic economic impacts to area residents and the local government.

Response: The commenter has made an unsubstantiated claim regarding implementation of the regional haze program. In accordance with section 169A of the CAA, EPA, in consultation with

[569] Id. section IV.E.2.
[570] Id. section IV.E.3.

the Department of Interior, promulgated a list of 156 areas where visibility is identified as an important value. See 44 FR 69122, November 30, 1979. These are considered "mandatory Class I federal areas." The requirements of the visibility program set forth in section 169A of the CAA apply only to mandatory Class I federal areas. In today's action, EPA is acting within the authorities and requirements established by statute and regulation towards the goal of improving visibility at nine of the mandatory Class I federal areas, areas where visibility is impacted by the Hunter and Huntington power plants. EPA does not intend for this action to adversely affect the local economy in areas surrounding these nine Class I areas.

Comment: [UAMPS, p. 2] UAMPS also contends the FIP is unnecessary and unwarranted and will impose significant economic burdens on UAMPS and its members and their customers, especially given the uncertainty surrounding the long-term viability of this coal resource.

Response: The BART Guidelines permit consideration of economic impacts only under "unusual circumstances" where a potential control option is expected to have a "severe impact on plant operations" or "result in significant economic disr uption or unemployment." The commenter has not provided any evidence that our action today wou ld result in the closure of any of the affected units.

Comment: [UAMPS, p. 3] UAMPS currently manages 17 separate projects that provide power supply, transmission, and other services to participating members. One of these projects is UAMPS part ownership in Hunter Unit 2 ("Hunter Project"). In addition to owning interests in or directly operating power plants and other sources of electrical power, UAMPS and its members regularly purchase power off the grid, and are, therefore, sensitive to market and regulatory forces that impact electricity affordability and reliability.

Response: Comment noted.

Comment: [UAMPS, p. 3] UAMPS Interest in the Hunter Unit 2 The Hunter 2 Unit is a 430 MW coal-fired electric generating unit located in Emery County that is jointly owned by PacifiCorp, UAMPS and Deseret Generation & Transmission Co-operative and operated by PacifiCorp in conjunction with two other coal-fired units with a combined generating capacity of approximately 1472 MW. UAMPS owns an undivided 14.582% ownership interest in Hunter Unit 2, which represents approximately 63 MW of generating capacity for UAMPS and its participating Members. Annually, this represents approximately 552,246 MWh hours. Twenty-three UAMPS Members participate in the Hunter Project. These members consist of small municipalities and other community-owned public electric utilities. These participating members are all small, serving an average of 4,247 customers, and have populations less than 50,000.

Response: Comment noted.

Comment: [NPS, pp. 1-2] In a letter dated April 2, 2015, the Associate Regional Director of the NPS Intermountain Region underscored the need to take strong action to restore air quality and remedy existing visibility impairment in the noted five Class I national parks in Utah, and

emphasized the fundamental importance of clear visibility to the purposes for which Congress established these national parks.[571] In 2014, national parks in Utah recorded over ten million visits, and visitors added $730 million to Utah's economy and created over 12,000 jobs.[572] In visitor surveys across the NPS, 90 percent of visitors surveyed consider clean air and scenic views very to extremely important resources to protect.[573]

Response: EPA acknowledges the comments. Neither Section 169A of the CAA nor the BART Guidelines requires that BART analyses include or quantify benefits to health or tourism or impact on employment. Although a quantitative analysis of the health and tourism benefits is beyond the scope of what is required under BART, EPA agrees with commenters that emission reductions achieved to improve visibility will also improve air quality. Improved air quality, in turn, affects public health and may enhance tourism in the area. EPA notes that even if we had quantified the benefits to health and tourism, such an analysis would not likely have altered the outcome of our BART determinations which already require the most stringent control technology available for NO_x.

Comment: [Conserv Orgs, p. 5] Finally, investment in BART pollution control technologies is a job-creating mechanism in itself. Each installation creates short-term construction jobs as well as permanent operations and management positions.[574]

Response: We acknowledge that today's action may have positive economic impacts, as described by the conservation organizations. However, we have not taken potential economic benefits into account in our action, nor are we required to, as previously described.

Comment: [UPHE, p. 12] If a commitment to get replacement power from a non-polluting source is included in the EPA's co-proposal to adopt the Utah SIP, it would cure the main flaw in that co-proposal. It is very likely a more cost-effective way to get the same amount of reduction in pollutants and their associated haze. At the same time, it would help Rocky Mountain Power and the State of Utah comply with the tightened ozone air quality standard, the tightened mercury standard, and carbon dioxide limits that the Clean Power Plan will eventually impose. However, there are co-benefits to cleaning the air over these portions of our State. The pollution that currently impairs the view of Utah's national parks and wilderness areas more than 75% of the time greatly compromises their cultural and economic value to our State. Reducing that pollution has enormous economic and cultural value to our State, and that value should be fully

[571] Letter from Tammy Whittington, Associate Regional Director, NPS Intermountain Region, to Amanda Smith, Executive Director, Utah Department of Environmental Quality (4-2-2015).
[572] National Park Service, 2014 National Park Visitor Spending Effects: Economic Contributions to Local Communities, States, and the
Nation, Natural Resource Report NPS/NRSS/EQD/NRR-2015/947 (April 2015), available at https://www.nature.nps.gov/socialscience/docs/VSE2014_Final.pdf. .
[573] Kulesza, C., Y. Le, and S.J. Hollenhorst, National Park Service visitor perceptions & values of clean air, scenic views, & dark night skies; 1988-2011, Natural Resource Report NPS/NRSS/ ARD/NRR-2013/632 (2013).
[574] For a recent example, see Ceres and James Heintz, NEW JOBS - CLEANER AIR: Employment Effects Under Planned Changes to the EPA's Air Pollution Rules, Political Economy Research Institute, University of Massachusetts (Feb. 2011).

accounted for in the EPA's decision to select one of its two co-proposals to bring Utah into compliance with the EPA's regional haze rules. Any balanced analysis of the economic impact of complying with the regional haze rule must also, however, reflect the economic cost of the health benefits that Utah's residents would gain as a co-benefit of reducing the pollutants that currently enshroud our national parks the vast majority of the time. The main purpose of UPHE's comments is to encourage the EPA to take the latter costs into account in deciding which of its co-proposals to adopt.

Utah's Division of Air Quality's amended analysis frankly admits that its primary concern is that requiring BART to reduce NO_x would cost Utah ratepayers too much, and, if PacifiCorp were required to install BART to reduce NO_x throughout its entire electric power network, it would hurt PacifiCorp's bottom line too much.[575] Utah's DAQ accepts PacifiCorp's assertion that applying Selective Catalytic Reduction technology to its four central Utah plants that are subject to BART would require an investment of $170 million each ($680 million total). It argues that much of this additional expense would be passed through to Utah ratepayers.

Response: We acknowledge the commenter's suggestion of obtaining replacement power (potentially to address generating capacity lost from closure of the Carbon facility) from a non-polluting source and the co-benefits of such an endeavor. However, this approach was not presented by Utah as part of its BART Alternative and consequently is not before EPA for consideration at this time. As we note in responses to other comments, EPA disagrees with the comment that the cost effectiveness of BART must account for public health costs associated with poor air quality. Neither Section 169A of the CAA, nor the BART Guidelines, require the BART analysis to include or quantify benefits to health. Moreover, an analysis of health benefits is unlikely to alter the outcome of our BART determinations which already require the most stringent control technology available for NO_x.

Finally, regarding the commenter's concerns about Utah's focus being adverse to ratepayers, the BART Guidelines permit consideration of economic impacts only under "unusual circumstances" where a potential control option is expected to have a "severe impact on plant operations" or "result in significant economic disruption or unemployment." The State did not

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[575] See Staff Review of 2008 Best Available Retrofit Technology (BART) Determination, September 12, 2014 (September 12 BART Review), at 24-29. This staff review commentary makes it clear that it accepts the argument made by PacifiCorp when it was fending off a proposal that it apply BART to reduce the NO_x emitted by its Jim Bridger Plant in Wyoming. PacifiCorp complained:

more than 80% of PacifiCorp's 6,157 total owned megawatts of coal-fueled generating capacity are BART-eligible and approximately half (more than 3,000 megawatts) of PacifiCorp's coal-fueled generating capacity will be subject to the installation of controls within the next five years . . . If EPA ultimately attempts to require four additional SCR on PacifiCorp's coal-fueled Utah units as BART controls, which is beyond the NO_x controls already installed or planned for those units under the existing Utah SIP, then the impact on PacifiCorp, its customers, and system reliability will be even more severe.

This staff review was forwarded to the Air Quality Board by its Executive Secretary in a September 16, 2014 memo recommending approval of the staff recommendation.

provide any evidence that our action today would result in the closure of any of the affected units. We have responded to comments of this nature accordingly elsewhere in this document.

Comment: [UPHE, p. 52] The health care costs that are caused by the $PM_{2.5}$ pollution traceable to PacifiCorp's central Utah fleet are:

Total Annual Health Costs For Hunter Units 1 and 2 = 0.663 x $91.930,000 $60,949,590

Total Annual Health Costs From Huntington Complex = $117.362,000

Total Annual Health Costs Of PacifiCorp's Central Utah Plants That Are Subject To BART = $60,949,590 + $117.362,000 = $178,211,590

As noted above, estimated rates by which NO_x is converted to $PM_{2.5}$ range up to 35%, depending on season and region. This conversion rate is not specifically known for any particular Class I area in the Colorado Plateau. If the upper range is applicable, to the 300-kilometer-radius area that is impacted by the PacifiCorp central Utah fleet, the implied savings in health care costs in that impacted area due to reduced $PM_{2.5}$ derived from an 87% reduction in NO_x due to the installation of BART would be

$178,211,590 x 0.87 x 0.35 = $54,265,429.

Response: EPA disagrees that the cost effectiveness of BART must account for public health costs associated with poor air quality. Neither Section 169A of the CAA, nor the BART Guidelines, require the BART analysis to include or quantify benefits to health. Moreover, an analysis of health benefits is unlikely to alter the outcome of our BART determinations which already require the most stringent control technology available for NO_x.

Comment: [UPHE, p. 53] In this section, we present an estimate of the annual savings in health-care costs that installing BART NO_x controls could be expected to cause through a consequent reduction in exposure to $PM_{2.5}$ in the area impacted by PacifiCorp's central Utah fleet. That estimate is $54,265,429. Together, the estimated annual savings that would be captured by installing BART NO_x controls would be

$13,821,789 + $54,265,429 = $68,087,218

This estimated annual savings compares favorably to the annual cost of installing BART NO_x controls. Using EPA-adjusted data, we estimated that annual cost to be $77 million.

Response: EPA disagrees with the comment that the cost effectiveness of BART must account for public health costs associated with poor air quality. Neither Section 169A of the CAA, nor the BART Guidelines, require the BART analysis to include or quantify benefits to health. Moreover, an analysis of health benefits is unlikely to alter the outcome of our BART determinations which already require the most stringent control technology available for NO_x.

Comment: [Docket ID-0165] The Utah Mining Association (UMA) is a 101-year old, 120-member, non-profit, non-partisan trade association representing the interests of the mining industry in Utah. UMA members are actively involved in exploration and mining operations on public and private lands throughout the state. Our diverse membership includes every facet of the mining industry, including geology, exploration, mining, engineering, power generation, equipment manufacturing, legal and technical services, and sales of equipment and supplies. As significant energy ratepayers, our members are directly affected by the EPA's proposal.

Response: Comment noted.

Comment: [Transcript pp. 119-120] One commenter noted that the proposed FIP will require Rocky Mountain Power to spend nearly 700 million dollars. Rocky Mountain Power has a customer base of approximately 83,000 households. The FIP, if implemented, will cost each of these households $8,434. This hurts every citizen of that system, especially the low and fixed income families. The FIP would provide less than one deciview improvement on average which is not noticeable to the human eye. The federal government would be forcing the rate payers of Utah to pay a great cost for something that they cannot even see.

Response: First, we disagree that our FIP will require Rocky Mountain Power to spend $700 million dollars. EPA's revised estimate of the total capital costs for the FIP is $517 million dollars. Second, EPA's evaluation of capital and annual expenses associated with implementation of the FIP shows such expenses to be justified by the degree of improvement in visibility in relationship to the cost of implementation. We note that for electric utilities, while EPA has not customarily analyzed or considered ratepayer impacts in BART determinations,[576] it is readily apparent that the household cost impacts suggested by the commenter are significantly overstated. Based on other economic analyses we have reviewed,[577] residential customers are more likely to experience rate increases in the range of 5-10% due to installation of SCR controls required by the FIP. While these projected rate increases are not trivial, they are comparable to average historical rate increases for Rocky Mountain Power (aka PacifiCorp), Utah, and U.S. ratepayers.[578]

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[576] Exceptions include EPA's Regional Haze FIP for Hawaii, where we analyzed potential rate impacts due to the unique energy situation in Hawaii, (77 FR 61478, 61488 (Oct. 9, 2012));, EPA's BART FIP for Four Corners Power Plant, where we examined potential rate impacts as part of tribal consultation, (77 FR 51620, 51625-51626 (Aug. 24, 2012));, and EPA's BART FIP for Apache Generating Station to understand the rate impacts on Arizona Electric Power Cooperative as a small entity, (77FR 72512 (Dec. 5, 2012)).

[577] Apache Plant: Report on SCR Incremental Cost Assessment, November 9, 2012 [original EPA docket ID EPA-R09-OAR-2012-0021-0211 and also included in the docket for this action] and The Cost of Clean Air, Effects of Air Pollution Controls on Electric Rates in North Dakota and Minnesota, Paul Chernick, November 7, 2011 [original EPA docket ID EPA-R08-OAR-2010-0406-0213, Attachment 5 and also included in the docket for this action.]

[578] Energy Information Administration (EIA) State Historical Tables for 2014, Released: February 19, 2015. Average Price by State by Provider, 1990-2014. http://www.eia.gov/electricity/data.cfm#sales, last accessed June 1, 2016.

Comment: [Transcript p. 175] One commenter described how Utah has slowly moved from a resource-stripping-based economy to a more diverse business and tourist-based economy especially in the regions near the national parks. The commenter suggested this has insulated Utah's economy from the boom to bust mining economy of the past and provided better economic growth through the recession than other states. The commenter also noted that PacifiCorp's parent company, Berkshire Hathaway, lists among its corporate principles, regulatory integrity and environmental stewardship and that regional haze provides a great opportunity for them to abide by those core principles. The commenter also noted that PacifiCorp facilities in many other states are modernized.

Response: EPA acknowledges the comments. Neither Section 169A of the CAA nor the BART Guidelines requires that BART analyses include or quantify benefits of a tourist-based economy. We take no position as to specific statements made in this comment.

Comment: [Transcript p. 182] One commenter asserted that taxpayer dollars are subsidizing coal leases as support for implementing the FIP.

Response: We acknowledge the commenter's support for this action. We take no position as to specific statements made in this comment.

Comment: [SCCAW, written hearing statement] A commenter believed that the cost for additional equipment will be borne by rate payers. SCCAW finds these costs reasonable in light of benefits because such costs would be costs recouped by reduction in possible medical expenses and increased longevity of the population.

Response: We acknowledge the commenter's support for this action. However, as described elsewhere in this document, neither the CAA nor the BART Guidelines requires that cost effectiveness of BART account for public health benefits related to improved air quality.

Comment: [SCCAW, written hearing statement, other commenters also expressed this viewpoint] One commenter believed that contrary to the viewpoint of mining personnel attending the hearing that any efforts to impose pollution controls would constitute an employment threat, the commenter noted that the imposition of pollution controls would actually increase employment. The commenter explained that employment would increase because fabrication, installation, and operation and maintenance of such pollution control equipment would be required, and because additional power to operate SCR would also be required, necessitating more coal that is mined.

Response: We acknowledge the commenter's view on this action's potential impact on employment. However, as detailed elsewhere in this response to comments section, a quantitative analysis of the action's potential impacts on employment numbers is not required under BART and this action.

Comment: [Transcript pp. 41-42] One commenter stated that for eight years in a row, Utah has taken the top ranking for the best economic outlook in the nation. A state with this type of economic outlook does not need nor deserve a pass on using the best technology available for controlling NO_x emissions. The state of Utah has the ability to support the Hunter and Huntington power plants financially so that the plants can afford to implement the best technology possible. We can protect jobs and the environment. We do not need to choose.

Response: We acknowledge the commenter's support for this action. However, neither the CAA nor the BART Guidelines requires EPA to consider Utah's economic status, nor Utah's ability to subsidize certain sources to help them acquire pollution controls as a basis for this action.

Comment: [Transcript p. 46] One commenter noted that Utah needs to clean up the air to keep its tourism and outdoor industries vibrantly growing. Utah's outdoor recreation industry generates 12.2 billion dollars annually. When people are deciding where to go on vacation, the reputation of a state matters. The outdoor consumer is savvy and well educated. They want to invest in places and companies that care about the health of people and the environment.

Response: Although we did not consider the potential positive benefits to the local and national economies, including tourism and outdoor industries, in making our proposal, we do expect that improved visibility would have a positive impact on local economies dependent upon tourism and outdoor activities. We similarly acknowledge the commenter's note on an outdoor consumer's investment preferences, but such information is beyond the scope of our decision-making in this action.

Comment: [Email to R8EISC] One commenter thought coal miners should get federal help to retrain for other work.

Response: It is not EPA's intention to endanger the economic viability of the coal mining community the commenter references. Neither the CAA nor the RHR requires states or EPA to consider potential job losses as part of a BART analysis. The federal government's potential role in mitigating any potential job losses are beyond the scope of this action.

Comment: [Transcript pp. 63-63] One commenter stated that national parks are a financial backbone of the state especially for rural economies. The commenter referred back to Governor Herbert's remarks from a couple of years ago when there was a government shutdown and the state used state taxpayer money to open up the parks in cooperation with the federal government to keep recreational revenue flowing. The commenter offered this example as evidence that the State knows how important the parks are to Utah's economy and that this should be sufficient reason not to take any chances with visibility in the state's Class I areas and their import to the economy.

Response: As discussed in greater detail elsewhere in this document, we recognize the role that protecting visibility in national parks wilderness areas has to tourism, and that Class I areas and other national parks and wilderness areas are a source of jobs that contribute to the economies of

their respective states. We also agree the visibility at Class I areas must be improved pursuant to the CAA. However, we cannot specifically take these types of potential economic benefits into account in our action.

Comment: Many commenters expressed a willingness to pay more for electricity if costs for additional NO_x controls are passed on to rate payers.

Response: Comment noted.

Comment: [Written statement] One commenter supporting the proposed FIP, thought increased costs should be passed on to the consumer to encourage energy conservation.

Response: EPA acknowledges the commenter's support for the proposed FIP. We direct the commenter to the detailed responses to specific comments provided elsewhere in this document for the reasons we are disapproving Utah's Alternative to BART for NO_x.

Comment: [Transcript pp. 81-82] One commenter said the Governor's energy proposal for the future looked at the number of jobs in different sectors of the energy industry. While there were quite a few jobs in the coal industry, there were even more in renewable energy. Even though only 2 percent of Utah's energy is in renewables, there are more jobs in that area.

Response: We acknowledge that today's action may have positive economic impacts. However, we have not taken potential economic benefits into account in our action.

Comment: [Transcript pp. 94-95] One commenter who has been a full-time river guide since 1980 and has done over 350 river trips down to Canyonlands National Park and 50 trips in the Grand Canyon has seen effects of climate change and air quality. This impacts his livelihood. He supports the EPA plan which will improve air quality and protect jobs provided by clean air resources.

Response: We acknowledge the commenter's support for this action. We agree that while the purpose of this action is to reduce regional haze, improvements in air quality in national parks and wilderness areas can have other ancillary benefits, including supporting the state's outdoor recreation industry and its jobs. However, as discussed previously, EPA cannot specifically take these types of economic benefits into account in our action.

Comment: [Transcript p. 98] An outdoor equipment company headquartered in Salt Lake City, discussed that their business depends upon the health of the national parks.

Response: See response to comment above.

Comment: [Transcript pp. 110-111] One commenter stated that in 2014, over 10 million visitors traveled to visit our national parks, generating 730 million dollars for Utah's economy.

The tourism industry supports about 132,000 jobs, or about one out of every 10 jobs in the state. It is a major sector of the economy and it is seeing the highest year-to-year growth rate.

Response: As stated above, we agree that Class I areas and other national parks and wilderness areas are a source of jobs in the tourism industry and contribute to the economies of the state. However, EPA cannot specifically take these types of economic benefits into account in our action.

Comment: [Utah State Court agent for the National Park Service and the superintendent of the Timpanogos Cave National Monument, transcript pp. 129-133] A commenter emphasized that EPA and the National Park Service have a shared mission of protecting our national parks unimpaired for future generations. Clearly, this is not just a technical engineering problem. Any approach to reducing haze will have social, political and economic implications as evidenced by the people attending the hearing. Addressing the issue of tourism and those economic impacts, tourism is a significant contributor to the overall economy of Utah. In 2013, tourists did spend 7.5 billion dollars in the state of Utah, resulting in 1 billion dollars of estimated revenue at the state and local tax levels, 3.7 billion in total towards related wages and the employment of approximately 132,000 people. The NPS estimates that in 2014, Utah park visitors alone spent approximately 730 million dollars in our local gateway communities directly supporting 12,600 jobs and 376 million in labor income. That year saw 10.5 million recreational visits in Utah's national parks. But this past year, 2015, that number grew by 12 percent with a record breaking 11,800,000 recreational visitors. Increased visitation will only increase this economic impact. It's notable that much of this increase can be directly attributed to the recently intensified marketing campaign by the Utah State Office of Tourism. The state has brilliantly capitalized on the scenic beauty of its natural parks in this highly successful, award-winning campaign with images of Delicate Arch and other iconic Utah park scenes everywhere from magazine ads to the sides of taxicabs. This scenery clearly has economic value which must be considered in the evaluation of these proposals. The commenter noted he was joined by superintendents of four of the five parks. He supports the proposal to disapprove the BART Alternative and finalize the FIP if that is what EPA's analysis truly finds provides the greatest protection for our national parks.

Response: We acknowledge the commenter's support for this action. We agree that protecting visibility in national parks and wilderness areas have a role in providing ancillary benefits, including supporting tourism throughout Utah. While we disagree that the potential economic benefits stemming from such scenery should be specifically accounted for in our action, we do agree that visibility at Class I areas is required to be improved according to the CAA and Regional Haze Rule as described elsewhere in this document.

Comment: [Transcript, pp. 162-163] One commenter, in support of the FIP, asserted that the only cost considered by Rocky Mountain was for the actual controls but did not look at other costs such as tourism, Native American cultural sites, public health or environmental degradation.

Response: We acknowledge the commenter's support for this action. We disagree with the commenter that Rocky Mountain was required to consider other costs such as tourism, Native American cultural sites, environmental degradation, or public health in its BART analyses because consideration of such costs are not required under either Section 169A of the CAA or the BART Guidelines.

Comment: [Transcript pp. 172-174] A commenter representing Utah Citizens Advocating Renewable Energy (UCARE) expressed concern that societal costs of electric generation are not factored into the determination of reasonable costs for reducing pollutants in the SIP. The commenter submitted a disk with copies of several documents related to advocating for renewable energy in addition to a copy of its comment letter to UDAQ on the State's regional haze Progress Report. In the Progress Report comment letter, the commenter provided examples of societal costs and suggested the use of a tool called EPA's Societal Cost Test for conducting additional analysis. The commenter asserted that the DAQ should require PacifiCorp to include data on the health care, economic, and other societal impacts of energy production scenarios that including those that would involve conversion of the four BART facilities to natural gas and those that would involve replacement of the BART facilities' base load by renewable energy sources coupled with utility-scale energy storage. The commenter felt that the SIP's preference for stating the problem as one of "visibility" masks the real threats to public health and lessens the likelihood that the best solutions will be discussed. The term "visibility" should be replaced by "air quality" in the SIP. The commenter expressed the opinion that costs for complying with regional haze requirements should not be passed on to ratepayers. The definition of what constitutes "reasonable progress" should be revisited, and the Utah public given ample opportunities to comment.

Response: EPA disagrees with the comment that the cost effectiveness of BART must account for societal costs such as general public health costs associated with poor air quality. Neither Section 169A of the CAA, nor the BART Guidelines, require the BART analysis to include or quantify benefits to health. The commenter expressed similar concerns in his written comments that pertain more specifically to environmental justice and disproportionate impacts on low income and minority populations, we have responded to that concern in the section regarding legal issues. Regarding the comments on the State's 5-Year Progress Report SIP, these are largely beyond the scope of today's action. We note that the State provided responses to these comments in its Progress Report SIP submitted to EPA on March 7, 2016. Many of the commenter's concerns pertaining to the Progress Report such as requiring PacifiCorp to consider natural gas conversion for the BART units or changing the focus of the regional haze program to air quality instead of visibility, are contrary to the EPA regulatory requirements and are beyond the scope of the State's regional haze SIP. Many of the commenter's concerns are better addressed by Utah's air quality programs related to national ambient air quality standards for criteria pollutants. EPA will further consider the commenters concerns when we take action on the Utah Progress Report submittal in the future.

Comment: [Transcript pp. 205-207] One commenter asserted that installing up-to-date reasonable pollution controls was a question of asking industry executives to be good neighbors

as this is the same technology already used in over 250 plants. She also said that if coal plants are going to be allowed to operate near national parks, they must take every reasonable precaution to mitigate the effects to those parks. If the coal industry is going to center the discussion around the economic impact as our primary value, then we must not allow one industry to stamp out another. The commenter provided the following information from a report by the University of Utah Business School entitled The State of Utah's Tourism, Travel and Recreation Industry (no copy of the report was provided). Nonresident tourists and travelers spent 7.5 billion dollars in the Utah economy in 2013. Travelers spending generated a record 1.2 billion dollars in state and local taxes. For context that is higher than California, Texas, Illinois and even New York generated in travel-based employment. The commenter also stated that more than 40 percent of the total private jobs in Daggett, Garfield, Grand, Kane, Wayne and Summit counties were in the leisure and hospitality sector in 2013. Tourism-related revenue grew 22 percent from 2009-2013. She emphasized that if coal generated haze compromises the views, that the tourism industry will be adversely impacted. Another commenter also noted that Salt Lake City loses a tremendous amount of tourist business and experiences relocation of Utah businesses because of the bad haze in the Salt Lake Valley.

Response: We acknowledge the commenter's support for this action. We agree that while the purpose of this action is to reduce regional haze, improvements in air quality in national parks and wilderness areas can have other ancillary benefits, including supporting the state's outdoor recreation and tourism industries. However, as discussed previously, EPA cannot specifically take these types of economic benefits into account in our action.

Comment: [Registration card] Consider the impacts of haze not only on the great beauty of the American people's parks, but on the tourism industry which brings 7.5 billion dollars to the Utah economy. Commenter appealed to sense of fairness in not allowing one industry to trample another.

Response: See response above.

Comment: [Savage, a support company for PacifiCorp, made similar comment] Utah's SIP produces greater reasonable progress at significantly lower costs, with a total capital cost savings of over $700 million when compared to the FIP.

Response: As discussed elsewhere in the document, EPA's evaluation of costs associated with implementation of the FIP compared to Utah's SIP shows such expenses to be justified by the degree of improvement in visibility in relationship to the cost of implementation.

Comment: [Transcript p. 61] One commenter said EPA is required to consider economic impacts to different areas per 13 CFR 121.2012. EPA explained the requirement at length but failed to support its claims that there would be no effect on the economy in the area.

Response: EPA disagrees with the commenter that EPA was required to consider impacts on local economies as part of this action. Neither the CAA nor the Regional Haze Rule requires states or EPA to consider economic impacts, although as explained previously, the Guidelines permit EPA to consider "significant economic disruption or unemployment" as part of "energy impacts."

Comment: [Transcript p. 35] One commenter said that the cost savings for the state plan compared to the federal plan amounts to economic justice for all of our citizens and especially the poor, who must pay for electricity as well.

Response: EPA disagrees and suggests that the commenter refer to EPA responses elsewhere in this document, including our responses to PacifiCorp's comment regarding (at p. 22 of its comments) "Comparing Costs of BART and the BART Alternative Section" as well as UCARE's comment regarding (at p. 2 of its comments) disproportionately high and adverse human health, economic, and environmental impacts on minority and low-income communities in Utah in the "Legal Analysis" sections of our responses to comments.

Comment: [Transcript pp. 70] In expressing similar concerns about economic impacts of the federal plan raised by other commenters, one commenter noted that 80 percent of the economy in Carbon and Emery counties is dependent on mineral extraction and power generation. The commenter noted that if another power plant is lost (referencing that the Carbon plant was already sacrificed two years early to attain the BART Alternative), or more coal mines are lost, that people in those counties may move to Salt Lake and compete for jobs there, which will give rise to increased air pollution impacts there.

Response: EPA disagrees with the commenter that EPA was required to consider impacts on local economies as part of this action. Neither the CAA nor the Regional Haze Rule requires states or EPA to consider economic impacts, although as explained previously, the Guidelines permit EPA to consider "significant economic disruption or unemployment" as part of "energy impacts." The commenter did not provide evidence or analysis that supports the assertion.

Comment: [Transcript pp. 71-72] Several commenters discussed the potential job loss impacts. One commenter noted that 75 jobs were lost with the Carbon plant shutdown and that should be compounded by approximately five, and that there are at least 300 jobs that were either done away with or jeopardized. In addition there are ancillary jobs related to a coal mine such as stores, tourism, and real estate.

Response: It is not EPA's intention to endanger the economic viability of the coal mining community, and related industries that the commenter references. Neither the CAA nor the RHR requires states or EPA to consider potential job losses as part of a BART analysis.

Comment: One commenter noted that increased electricity costs may increase the possibility that jobs will no longer be as likely to stay in the region. The commenter provided the example

of the NSA facility located at Point of the Mountains. It located there not because of the available resources from the colleges but because it is a low cost area for electric power.

Response: We acknowledge the commenter's concerns regarding the proposed FIP and its potential effects on electricity rates and its effect on where businesses locate. However, the cost of electricity to consumers is outside the scope of our evaluation for this action.

Comment: One commenter noted that the economic impact of Rocky Mountain Power in Emery County is about 800 plus jobs.

Response: We acknowledge the commenter's concern regarding potential job impacts due to implementation of the FIP. It is not EPA's intention to endanger the economic viability of the Rocky Mountain Power community the commenter references. Neither the CAA nor the Regional Haze Rule requires states or EPA to consider potential job losses as part of a BART analysis. The federal government's potential role in mitigating any potential job losses are beyond the scope of this action.

Comment: Mass mailer commenters (approximately 30 of this type received) asserted that they understand that if part of the SIP is rejected and a FIP is used to address that part of the plan that is rejected, additional expensive pollution controls will be required to be installed at the Hunter and Huntington power plants. The commenters noted that they had read that these controls could cost up to 700 million dollars to construct and operate. They also noted that installing these expensive controls will not appreciably further reduce sources of regional haze beyond the levels of reduction anticipated from the steps that PacifiCorp has already implemented. Further, they understand the state believes its plans will be more effective than the EPA's plan in reducing regional haze.

The commenters stated that they live and recreate in the areas of Utah where the regional haze rules are meant to improve air quality. They noted that they and their families enjoy the great vistas often experienced in the National Parks and rural areas of Utah. The commenters noted that they are aware there are many sources of regional haze including upwind off-shore sources (China), western forest fires, emissions related to transportation, manufacturing, and power generation.

The commenters said they enjoyed paying some of the lowest rates in the nation for the electricity their families consume. The rates are low because 80 percent of that electricity is generated by burning coal. Low electricity rates, in part, allow their families to enjoy a standard of living that includes visiting and recreating in the parks, monuments, and wild areas of Utah. It makes little sense to them that the EPA would feel the need to force a FIP on the state that would require PacifiCorp to spend $700 million dollars on emission controls that would imperceptibly reduce regional haze and be less effective than the state plan. The cost of those controls will be passed on to the rate payers, resulting in not only higher utility rates but in increased costs of local goods and services.

Commenters asked EPA to help keep electricity rates low and allow the commenters to decide where to spend their hard earned money by accepting Utah's SIP in its entirety. EPA should not implement a FIP that requires expensive emission controls that will do little to reduce regional haze.

Response: We disagree that our FIP will require Rocky Mountain Power to spend $700 million dollars. EPA's revised estimate of the total capital costs for the FIP is $517 million dollars. We also disagree with the commenter's view that requiring Rocky Mountain Power to install pollution controls would not appreciably reduce sources of regional haze. As described previously, EPA's evaluation of capital and annual expenses associated with implementation of the FIP shows such expenses to be justified by the degree of improvement in visibility in relationship to the cost of implementation. BART requires that we evaluate: (1) Cost of compliance, (2) the energy and non-air quality environmental impacts of compliance, (3) any existing pollution control technology in use at the source, (4) remaining useful life of source, and (5) degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. CAA section 169A(g)(1) and 40 CFR 51.308(d)(1)(i)(A). Further our rationale for concluding that the federal plan would be more effective than the state plan in reducing visibility is provided in greater detail in the preamble of this notice. Finally, the cost of electricity to consumers is outside the scope of our evaluation for this action. We also note that for electric utilities, while EPA has not customarily analyzed or considered ratepayer impacts in BART determinations,[579] it is readily apparent that the household cost impacts suggested by the commenter are significantly overstated. Based on other economic analyses we have reviewed,[580] residential customers are more likely to experience rate increases in the range of 5-10% due to installation of SCR controls required by the FIP. While these projected rate increases are not trivial, they are comparable to average historical rate increases for Rocky Mountain Power (aka PacifiCorp), Utah, and U.S. ratepayers.[581]

Comment: Mass mailer commenters (approximately 60 of this type received) noted similar sentiments to those listed above in addition to discussing that they currently work for a coal company that supplies most of the coal that the Hunter and Huntington power plants burn to generate electricity. The commenters said that the electricity is available for use by most of the residents of Utah and parts of some of the surrounding states. Those coal fired power plants

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[579] Exceptions include EPA's Regional Haze FIP for Hawaii, where we analyzed potential rate impacts due to the unique energy situation in Hawaii(77 FR 61478, 61488 (Oct. 9, 2012)); EPA's BART FIP for Four Corners Power Plant, where we examined potential rate impacts as part of tribal consultation (77 FR 51620, 51625-26 (Aug. 24, 2012)); and EPA's BART FIP for Apache Generating Station to understand the rate impacts on Arizona Electric Power Cooperative as a small entity (77FR 72512 (Dec. 5, 2012)).

[580] Apache Plant: Report on SCR Incremental Cost Assessment, November 9, 2012 [original EPA docket ID EPA-R09-OAR-2012-0021-0211 and also included in the docket for this action] and The Cost of Clean Air, Effects of Air Pollution Controls on Electric Rates in North Dakota and Minnesota, Paul Chernick, November 7, 2011 [original EPA docket ID EPA-R08-OAR-2010-0406-0213, Attachment 5 and also included in the docket for this action.]

[581] Energy Information Administration (EIA) State Historical Tables for 2014, Released: February 19, 2015. Average Price by State by Provider, 1990-2014. http://www.eia.gov/electricity/data/state/avgprice—annual.xls, last accessed May 31, 2016.

supply some of the lowest cost electricity per kilowatt hour in the nation. However, if the FIP is implemented it will raise those rates and make those power plants charge more for the power they sell.

Response: We acknowledge the commenter's concerns regarding the proposed FIP and its potential effects on electricity rates. However, the cost of electricity to consumers is outside the scope of our evaluation for this action.

Comment: Mass mailer commenters (approximately 60 of this type received) noted that according to the Utah SIP, the PacifiCorp-owned Carbon Power Plant was recently shut down in part to meet the requirements of reducing regional haze. This has resulted in the loss of high-paying jobs at the power plant as well as jobs at the coal mines that supplied fuel to the plant, jobs at the trucking companies that transported the coal to the power plant, driven suppliers and vendors out of business that supported the plant and mines, added additional numbers to those seeking government welfare and unemployment benefits, and further depressed the job market in the Carbon County, Utah area.

The commenters stated that their fear is that rejecting part of the SIP and forcing PacifiCorp to install expensive emissions controls as per the proposed FIP will result in the loss of more power plant, coal mining, and service sector jobs. These high paying jobs will be lost without the hope of there being other jobs with similar pay and benefits available in this rural area of Utah. One of those jobs could be theirs. The real tragedy will be that their job could be lost because the EPA determined to implement a FIP that will be less effective than the SIP it is meant to in part replace.

Response: First, EPA acknowledges the comments. However, as noted previously, neither Section 169A of the CAA nor the BART Guidelines requires that BART analyses include or quantify impacts on employment unless "unusual circumstances" exist where a potential control option is expected to have a "severe impact on plant operations" or "result in significant economic disruption or unemployment." The commenters have not provided any specific information to indicate severe impacts on plant operations or a showing of significant economic disruption or unemployment that warrants additional analysis. As stated elsewhere in the document, we are not addressing the Carbon Power Plant as it relates to this action. Second, we disagree with the commenters that the FIP would be less effective than the SIP. For reasons described in further detail in our proposal and in this action, our basis for disapproval of the SIP for the NO_x BART Alternative for the power plants is based on the finding that the SIP is not consistent with the applicable statutory and regulatory requirements.

Comment: [Docket ID -0033] I believe that the proposed Utah State air quality mandates for local electrical energy production facilities are onerous enough to the local economy and that no additional EPA regulations should be added until the effects of the proposed state rules have been experienced for at least several years. I think that federal agencies such as the EPA have become more and more one sided in their approach to the administration of air quality and other environmental regulations and have lost most of the reasonable philosophical balance necessary

to effective rule making. I believe that a more realistic consideration of the effects of proposed environmental rules and regulations on local and national economic environments must be fostered within the EPA and other federal agencies. The lack of such consideration has already caused serious erosion of our economy and will continue to do so, if not corrected, to the point that our economy will no longer be able to support reasonable environmental mitigation efforts, either in our nation or in the world.

Response: We disagree with the commenter's suggestion that only state air quality mandates should be in effect because state mandates alone are burdensome to the local economy, and that additional federal requirements would further burden local economies. First, Section 169A of the CAA operates under the cooperative Federalism framework where EPA is obligated to implement its own FIP to correct any deficiencies in the SIP unless the State corrects the deficiency itself and EPA is able to correct such a deficiency within two years. While states maintain some flexibility in setting reasonable progress goals, such decisions must be reasonable and consistent with statutory and regulatory requirements. For reasons discussed elsewhere in this notice, Utah's SIP was not approvable. Second, we disagree with the commenter's statement that as a general matter, EPA does not consider economic impacts, including in the context of this action on regional haze. For example, as discussed elsewhere in this document, the BART Guidelines permit consideration of economic impacts under "unusual circumstances," evidence of which does not exist in this action.

Comment: [Docket ID -0057] Several commenters claimed that they did not see haze as a problem in Castle County. The commenters went on to say, "[t]hese plants provide jobs, which provide homes, clothing and food for Utah Families. If they can take all that away, due to a problem that doesn't even exist where the plants are... they can take away other jobs for imagined problems as well. Who knows, your industry and your job might be next."

Response: EPA disagrees with the commenter because the record data supports a finding that regional haze impacts many counties including Castle County. In addition, the existence of haze is not necessarily visible to the eye. As stated elsewhere in the document, it is not EPA's intention to endanger the economic viability of the power plant community the commenter references. Neither the CAA nor the Regional Haze Rule requires states or EPA to consider potential job losses as part of a BART analysis. The federal government's potential role in mitigating any potential job losses are beyond the scope of this action.

b. Public Health Concerns

Comment: [Conserv Orgs, p. 5] The same pollutants that contribute to visibility impairment also harm public health. The fine particulates that cause regional haze, $PM_{2.5}$, are a major public health concern because they can be inhaled deeply into the lungs. Fine particulate can cause decreased lung function, aggravate asthma, and lead to premature death in people with heart or lung disease. NO_x and VOCs are also precursors to ground level ozone, or smog. Ground level

ozone is associated with respiratory disease, asthma attacks, and decreased lung function.[582] Ozone concentrations in parks in Utah and the Four Corners region are approaching current health standard limits,[583] and will likely violate the new lower standards.[584] In fact, ozone levels in many parts of Utah, Arizona, and Colorado are already in the range of ozone levels deemed to be harmful to human health.[585, 586]

Response: EPA appreciates the commenter's concerns regarding the negative health impacts of $PM_{2.5}$ and ozone precursors such as NO_x and VOCs. While our action concerns visibility impairment, we note this action's potential for significant improvements in human health. For purposes of this action, however, we are not authorized to consider such health impacts in evaluating the SIP and promulgating our FIP, and we have not done so. Further, this action is limited to a determination of whether the BART Alternative would provide greater reasonable progress than BART. Therefore, an EPA assessment of current concentrations of ozone in relation to limits that potentially cause harm to human health is beyond the scope of this action and we take no position as to these specific statements.

Comment: [Conserv Orgs, p. 7] Medical research in the last ten years clearly indicates that there is no "safe level" of exposure to $PM_{2.5}$. Even levels which we previously thought to be benign we now know are not. There is no threshold below which health effects do not occur, and all persons are adversely affected, regardless of age and/or overall state of health.

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[582] *See* http://www.nature.nps.gov/stats/index.cfm.

[583] Monitors in Utah and the Four Corners region have registered ozone concentrations considered to be a violation of the new ozone NAAQS. As of 2008, the fourth highest ozone concentrations in Zion and Canyonlands national parks each year have averaged 72 ppb and 71 ppb respectively. Mesa Verde National Park and Petrified Forest National Monument each had 3-year averages of the fourth high ozone concentrations of 71 ppb as of 2008. Monitors in Grand Canyon National Park and Farmington, New Mexico had a 3-year average of the fourth highest ozone concentration equal to 70 ppb as of 2008. All monitor values and averages obtained from either UDAQ or EPA's AirData website.

[584] On October 26, 2015, EPA published a final rule strengthening the National Ambient Air Quality Standards (NAAQS) for ground-level ozone to 70 ppb based on extensive scientific evidence about ozone's harmful health impacts. *See* 80 FR 65292 (Oct. 26, 2015) (Final Rule for National Ambient Air Quality Standards for Ozone). For a map of counties exceeding the 70 ppb ground level ozone standard, see: http://ozoneairqualitystandards.epa.gov/OAR_OAQPS/OzoneSliderApp/index.html#.

[585] See Clean Air Scientific Advisory Committee correspondence with EPA Administrator Stephen Johnson (Oct. 24, 2006) ("Clean Air Scientific Advisory Committee's (CASAC) Peer Review of the Agency's 2nd Draft Ozone Staff Paper"). CASAC found that elevated ozone concentrations are associated with "an increase in school absenteeism; increases in respiratory hospital emergency department visits among asthmatics and patients with other respiratory diseases; an increase in hospitalizations for respiratory illnesses; an increase in symptoms associated with adverse health effects, including chest tightness and medication usage; and an increase in mortality (non-accidental, cardiorespiratory deaths) reported at exposure levels well below the current standard."

[586] A recent study in the New England Journal of Medicine provides confirmation that that longterm exposure to ozone increases the risk of death from respiratory causes. See Jerrett, Michael et al., *Long Term Ozone Exposure and Mortality*, 360 NE J Medicine 1085-95 (2009). In a long-term study of nearly 500,000 participants, the study found a 4% increase in death for respiratory causes for every 10-ppb increase in exposure to ozone. The risk of dying from respiratory causes in the highest-ozone areas was nearly three times that in the lowest-exposure areas.

Response: We appreciate the commenters' concerns regarding the negative health impacts of $PM_{2.5}$ exposure. As we state elsewhere in this document, we cannot and have not considered those health effects in arriving at our decision.

Comment: [Conserv Orgs, p. 7] Most Utahans are exposed to high levels of ozone in the summer, $PM_{2.5}$ in the winter, and PM_{10} and SO_2 year-round, meaning that a large percentage of Utah's population is exposed repeatedly to unhealthy levels of pollution throughout the year.

Response: We agree that the same PM2.5 emissions that cause visibility impairment can be inhaled deep into lungs, which can cause respiratory problems, decreased lung function, aggravated asthma, bronchitis, and premature death. Thus, although our action concerns visibility impairment, we note the potential for significant improvements in human health. However, we are not authorized by Congress under the Regional Haze Rule to consider health impacts in evaluating the State's regional haze SIP and promulgating our FIP, and we have not done so.

Comment: [Conserv Orgs, p. 7] Short term ozone inhalation results in a loss of maximal inspiration, increase in airway resistance, and causes a broad array of respiratory symptoms consistent with airway inflammation and damage—coughing, throat irritation, chest pain, shortness of breath and wheezing.[587] Symptoms related to pre-existing lung diseases like asthma, emphysema, and chronic bronchitis are exacerbated by ozone. Long term exposure to ozone is also associated with mortality from various causes with some studies indicating there is no threshold below which that relationship is no longer found.[588]

Response: EPA appreciates the commenter's concerns regarding the negative health impacts of ozone due to both short and long-term exposure. While our action concerns visibility impairment, we note this action's potential for significant improvements in human health. For purposes of this action, however, we are not authorized to consider such health impacts in evaluating the SIP and promulgating our FIP, and we have not done so.

Comment: [UPHE, p. 39] The Value of Small Reductions in Long-Term Exposure to Ozone. The primary ozone standard is based on a three-year average of the fourth-highest ozone reading over an eight-hour period. This emphasizes the desirability of avoiding exposure to short-term peaks over the need to avoid long-term exposure. This short-term emphasis may be appropriate for the eastern half of the United States where ozone concentrations are typically only a problem in the summer and its flanking months. But a standard formulated this way doesn't address the problem of long-term exposure.

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[587] US EPA, *Health Effects of Ozone in the General Population*, available at http://www.epa.gov/apti/ozonehealth/population.html.

[588] Atkinson RW, Yu D, Armstrong BG, Pattenden S, Wilkinson P, Doherty RM, et al., *Concentration-Response Function for Ozone and Daily Mortality: Results from Five Urban and Five Rural UK Populations*, Environ Health Perspect (2012), available at http://dx.doi.org/10.1289/ehp.1104108.

Most of the inland western United States has ozone concentrations year round that are above the World Health Organization's short-term standard of 51 ppb. The Wasatch Front, in particular, exceeds the new standard of 70 ppb at most monitoring stations. Up to now, the EPA has assumed that those who live in the West are adequately protected when short-term peaks above this standard are relatively infrequent.

This assumption is not warranted by the science. Epidemiological studies show that increases in long-term ozone exposure of 10-15 ppb result in increased mortality. Because residents of the West are more likely than other Americans to experience long-term, low-level exposure, the EPA should adopt a primary ozone standard that is strict enough to protect us from those risks.

Long term exposure to ozone is associated with mortality from various causes, with some studies indicating there is no threshold below which that relationship is no longer found. (Atkinson RW, 2012). Chronic exposure to ozone increases the risk of death from respiratory causes by 4% for each 10 ppb increase is ozone concentration. (Jerrett M, Burnett R, Pope CA, et al., 2009).

Research suggests that long-term ozone exposure might play a role in the development or progression of chronic lung disease and/or asthma, or the impairment of overall respiratory performance in otherwise healthy subjects. For example, a study found that for every increase in ozone of 10 ppb cumulative average over the previous six days, rates of an initial diagnosis of asthma increased 5%. (Wendt JK, 2014). Increases in emergency room visits for pediatric episodes of asthma are associated with modest increases in ozone during the few days prior to the visit. (Gleason J, et al., 2014).

The EPA recognizes the need to take the risk to human health from long-term exposure to ozone seriously by noting that:

> In spite of the inconclusive nature of the epidemiologic literature, the repeated cycles of damage, inflammation, and repair in humans and the morphological findings from the animal toxicological studies suggest that it would be prudent to avoid repeated short-term exposures, particularly in young children, until more is known about the effects of long-term ozone exposure. http://www.epa.gov/apti/ozonehealth/population.html.
> Most of the inland western United States has ozone concentrations year round that are above the World Health Organization's short-term standard of 51 ppb. The Wasatch Front, in particular, exceeds the new standard of 70 ppb at most monitoring stations. Up to now, the EPA has assumed that those who live in the West are adequately protected when short-term peaks above this standard are relatively infrequent.

Response: EPA appreciates the commenter's concerns regarding the long-term effects of ozone exposure on human health. While our action concerns visibility impairment, we note this action's potential for significant improvements in human health, including improvements stemming from reduced long-term ozone exposure. For purposes of this action, however, we are not authorized to consider such health impacts in evaluating the SIP and promulgating our FIP, and we have not done so. Further, the adequacy of the current primary ozone standard and whether it is able to

address the problems of long-term ozone exposure is beyond the scope of this action and we take no position as to these specific statements.

Comment: [UPHE, p. 34] Ozone can be transported hundreds of miles from its source. In the case of PacifiCorp's Utah fleet of coal-fired power plants, ozone formed from their NO_x emissions can spread across the entire state at various seasons and wind directions, including the Wasatch Front and the Uinta Basin. When it does, it adds to the considerable burden of ozone formed from the NO_x emitted by automobile traffic along the Wasatch Front and from the NO_x generated by the extensive drilling activity in the Uinta Basin.

Current levels experienced in both the Wasatch Front (Davis, Salt Lake, and Utah Counties) and the Uinta Basin, frequently violate the EPA's new ozone ambient air standard of 70 ppb—a level that the scientific evidence shows causes substantial harm to the health of both the vulnerable and the healthy segments of the population in those regions. The discussion that follows lists the various kinds of harm that ozone is causing the inhabitants of those regions. This harm would be significantly reduced if the EPA were to require an 87% reduction in the NO_x emitted by PacifiCorp's central Utah units that are subject to BART.

The Wasatch Mountains form a 90-mile spine running down the center of northern Utah. Most of Utah's 2.8 million people live along the western edge of those mountains. They occupy a string of high-altitude valleys that are hot, dry, and exposed to high levels of ultraviolet radiation much of the year. They are perfectly situated for automobile exhaust and oil refinery emissions to form and then trap ozone. The valleys of the Wasatch Front are developing in a manner that makes them increasingly resemble Los Angeles--vast, low-density development that is dependent on the automobile. Like Los Angeles, from downtown Salt Lake City, smog now obscures the 12,000-foot peaks that surround the valley for much of the year. In terms of ozone, the Wasatch Front has liabilities that Los Angeles doesn't. Ultraviolet rays reflect off the vast surface of the Great Salt Lake and combine with Volatile Organic Compounds emitted by flue gas from half a dozen oil refineries on its eastern shore to amplify the automobile-induced smog that hangs over the Salt Lake Valley. The Wasatch Front is also next door to PacifiCorp's fleet of coal-fired power plants, and shares in the emissions that they produce. Consequently, Utah's most populous counties (Weber, Davis, and Salt Lake Counties) often exceed the new NAAQS primary standards for ozone. (State of Utah Division of Air Quality: Area Designations at 13-14).

Response: EPA acknowledges the commenter's support for this action. While our action concerns visibility impairment, we note this action's potential for significant improvements in human health. For purposes of this action, however, we are not authorized to consider such health impacts in evaluating the SIP and promulgating our FIP, and we have not done so. We also acknowledge the potential for NO_x emissions from PacifiCorp's power plants to add to other sources of NO_x emissions including from automobiles and oil drilling activities in other parts of the State and contribute to the formation of ground-level ozone, which has been linked with negative health impacts. However, the scope of this action is limited to a comparison of BART and the BART Alternative for purposes of limiting emissions of visibility-impairing pollutants

emitted by select sources described in this action. The potential implications of emissions from other sources, such as automobiles and oil and gas drilling, is beyond the scope of this action.

Comment: [UPHE, p. 35] One commenter raised health concerns about the short-term exposure to ozone. The commenter cites studies demonstrating significant mortality effects even when ozone concentrations are below EPA's primary ozone standard. The commenter also states that nitrogen dioxide (NO_2) and ozone (O_3) are powerful oxidants in ambient air that are intimately linked with atmospheric chemistry and which continuously interact over very short timescales and that this provides a strong reason for modeling O_3 and NO_2 together in epidemiological studies, rather than modeling either of the two pollutants separately. The commenter concludes by stating that the EPA should recognize that reductions in ambient ground-level ozone in increments as small as 5 ppb can be expected to avoid substantial public health expenditures on behalf of the population that resides within the 300-kilometer-radius area whose atmosphere is significantly influenced by PacifiCorp's central Utah fleet of coal-fired power plants.

Response: EPA appreciates the commenter's concerns regarding the negative health impacts of ozone, including adverse impacts even at low-level, short-term exposures. While our action concerns visibility impairment, we note this action's potential for significant improvements in human health and public health expenditures. For purposes of this action, however, we are not authorized to consider such health impacts and public health expenditures in evaluating the SIP and promulgating our FIP, and we have not done so. Similarly, the adequacy of current ambient ozone standards to protect public health, and existing modeling analyses to assess ozone impacts on human health, are beyond the scope of this action and we take no position as to these specific statements.

Comment: [UPHE, p. 40] One commenter discussed the special need to reduce exposure to ozone in the Mountain West stating that the Mountain West has a particular vulnerability to long-term, low-level concentrations of ozone because of its geography. Specifically, the region is characterized by high-altitude, low humidity, and temperatures that are rising faster in response to climate change than is observed in the East. All of these characteristics facilitate ozone formation, leading to the highest background levels of ozone of any major geographical region in the country. The commenter also mentioned the impact of ground-level ozone on plant species, ground-level ozone's climate-forcing effect, and the climate-change feedback loop created by a rise in ozone concentrations in urban centers of the Mountain West. The commenter also pointed to fugitive emissions of nitrogen oxides, methane and other VOCs, and carbon monoxide from oil and gas wells recently drilled in southwest Wyoming, northwest Colorado, and northeastern Utah as contributors to eight-hour ozone concentrations exceeding 100 ppb. The commenter concludes by stating that applying BART to PacifiCorp's central Utah coal fleet would mitigate the physiological harm to people and vegetation from long-term, low-level exposure to ozone that is characteristic of the Mountain West. It would mitigate regional climate change, and help recover the blue vistas that once distinguished America's most iconic national parks.

Response: EPA appreciates the commenter's support for this action and acknowledges the commenter's concerns regarding the Mountain West's particular vulnerability to ozone due to its

geography that facilitates ozone formation. As noted previously, EPA acknowledges ozone's negative impacts on human health, the ecosystem, and its implications on the visibility of national parks that span multiple states. While our action concerns visibility impairment, we note this action's potential for significant improvements in these other areas. For purposes of this action, however, we are not authorized to consider such benefits in evaluating the SIP and promulgating our FIP, and we have not done so.

Comment: [UPHE, p. 43] The EPA's Estimate of the Benefits of Small Reductions in Exposure to Ozone is Substantially Understated. Whenever tightened pollution controls are proposed, defenders of the status quo, such as Utah Division of Air Quality, are quick to argue that we can't afford them. They say that while we could require industry and transportation to employ cleaner technologies, the expense of doing so would slow economic growth and reduce employment. They assume that the public policy choice is a Hobson's choice, in which we must either choose to protect air quality and human health, or protect the economy. Recent studies strengthen the evidence that this is a false choice. These studies imply that reducing pollution is much more likely to be a net benefit, rather than a net cost, to the economy. Reducing pollution doesn't just improve workers' health and wellbeing, it improves their productivity--and the economic value of this improved productivity can be measured.

It has been customary in the past to think of environmental protection as purely a tax on producers and consumers to be weighed against the consumption benefits associated with improved environmental quality. Environmental protection, however, is more legitimately viewed as an investment in human capital in the same sense that investments in education and information technology improve the productivity of the nation's workforce. The contribution of pollution mitigation to firm productivity and economic growth should be incorporated in the calculus of policy makers. With respect to ozone, specifically, new studies show that reducing ambient concentrations even by small amounts can substantially increase worker productivity, even where base levels of ozone are below current air quality standards.

Excluding California, the EPA estimates that the social benefits of tightening its primary ozone standard by 10 ppb to be as much as $38 billion by 2025, compared to compliance costs of $15 billion. This estimated benefit, however, is too low because it considers only externally-manifested health impacts (impacts that are highly visible and easily modeled such as deaths, emergency room admissions, and missed workdays). This leaves out of the analysis any benefits that are manifested internally, such as improvements in well-being and productivity, even though these effects apply to populations across the board, and are therefore potentially much larger. Modelling internally-manifested benefits such as the productivity impacts of reducing pollution is a relatively new field, but is of crucial importance.

A 2012 study published in the American Economic Review modeled the effect of variable ozone concentrations on the productivity of field workers in California's central valley. (Graff-Zivin, J., Neidell, M., 2012). It demonstrated a statistically robust dose response between ozone concentrations and productivity. The more physical exertion the various tasks required, the

greater the measured effect was. This result is consistent with ozone's depressive effect on respiratory capacity that has been amply documented by laboratory tests.[589]

The study found that a decrease in ozone concentration of 10 ppb increases the productivity of field laborers in California's central valley by 5.5%, on average. The authors apply the estimated productivity increase associated with a 10 ppb reduction in ozone concentrations (in the range that this rulemaking in now considering) to the compensation paid to agricultural laborers nationwide in 2007. It concludes that such a reduction in ambient ozone concentrations would have saved approximately $700 million in agricultural labor costs in 2007.

This approach can be applied to the wages and salaries earned in Utah in physically demanding occupations that are performed predominantly outdoors, on the presumption that they require enough physical exertion over the workday to raise respiration and heart rates above resting rates on a sustained basis.

The U.S. Bureau of Labor Statistics compiles mean annual wage and employment data broken down by 400 industries and 800 job classifications. This highly disaggregated dataset is sufficient to identify, with reasonable precision, job classifications that are performed predominantly outdoors and can be expected to require sustained periods of physical exertion during the majority of the workday. See BLS May 2014 Occupational Employment Statistics.

To obtain an estimate of the total value of labor performed in qualifying professions in 2014, we have multiplied employment totals in professions that meet this criterion by their corresponding mean annual salary. Qualifying professions were identified based on descriptions taken from the BLS's Occupational Employment Statistics, May 2014 Occupational Employment and Wage Estimates – Utah. These annual wages exclude benefits (health care, retirement, etc.) and should be multiplied by an appropriate factor to include the value of benefits. An appropriate factor is 1.33, since the most relevant industry category for which the BLS estimates benefits is the "Natural Resources, Construction, and Maintenance" category. Benefits paid in that industry average 33.3% of salaries. (BLS 2014 Table of Benefits).

As shown in Appendix 1 to these comments, total employment in each profession and its mean annual salary for qualifying categories of labor, adjusted for benefits, came to approximately $5,026,105,112 in 2014. This adjusted total labor compensation is then multiplied by 5.5% to obtain the value of the increased productivity (or labor saved) that the models predict would result from reducing ambient ozone concentrations by 10 ppb. The savings that would have

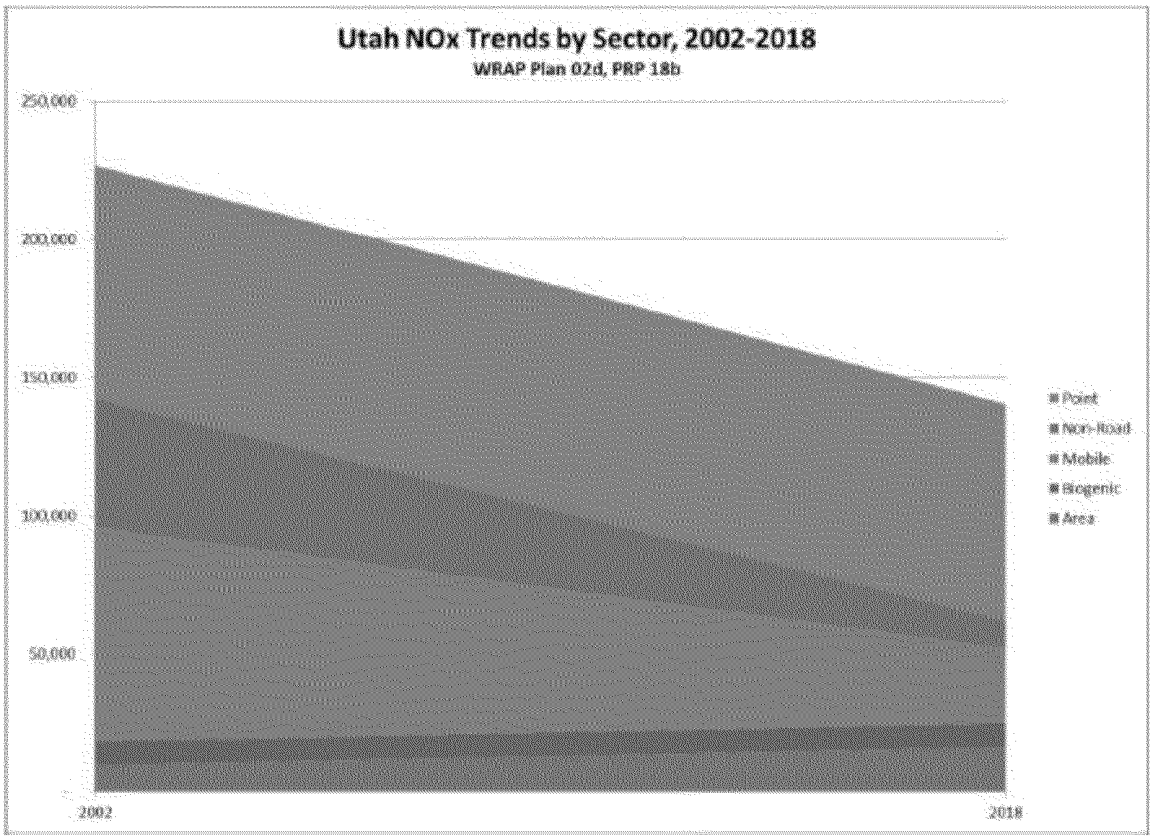
[589] Econometric regression models have also been used successfully to estimate the effects of pollutants other than ozone on the productivity of workers. For example, reducing ambient air concentrations of PM2.5, which penetrate buildings at high rates, has been estimated to have significant effects on the productivity of factory workers at concentrations well below the current NAAQS for PM2.5. This study concludes that increased factory worker productivity produced labor savings that were equal to one third of all of the economic benefits associated with the nationwide decline in PM2.5 ambient air concentrations from 1999 to 2008. (Chang, T., Graff Zivin, J., Gross, T., Neidell, M., 2014).

resulted from increased labor productivity in 2014, therefore, comes to $27,643,578. This figure should be reduced by half to reflect the fact that ozone concentrations in Utah are highest, and most likely to impair productivity, during the four hottest months of the year, and during the two coldest months of the year, when winter inversions and snow cover are likely to coincide.[590] Our resulting estimate of the value of annual labor productivity increases that are likely to result from reducing ozone exposure in Utah by 10 ppb is $13,821,789.

This calculation of the productivity benefits of reducing ozone concentrations is relevant to the decision that the EPA has to make whether to require PacifiCorp to install BART NO_x controls on its Utah units subject to BART. Ozone concentrations in the portion of Utah that lies within the 300-kilometer-radius air shed that is impacted by those units, including the Moab area, average near 70 ppb during peak ozone season. If ozone concentrations were reduced by 10ppb, that would constitute a modest 14% reduction. Although it is not known with certainty how much an 87% reduction in NO_x from those units will reduce ozone concentrations in this 300-kilometer-radius air shed, it is reasonable to expect that an 87% reduction in the main precursor of ozone would result in at least a 14% reduction in ozone.

The reasonableness of this expectation is confirmed by the fact that point sources account for the majority of total NO_x emissions in Utah. Figure 3 appearing on page 2 of DAQ's September 12 BART Review is reproduced below. It shows that point sources of NO_x emissions in Utah are the state's main source of NO_x, and Utah's point sources consist primarily of PacifiCorp's fleet of coal-fired power plants.

[590] See Margaret Kriz Hobson, *Wintertime ozone has researchers scrambling through heavily drilled parts of rural Utah*, Energywire (Feb. 14, 2013), available at http://www.eenews.net/stories/1059976330.



The tightened ozone standards that the EPA issued in October of this year will very likely put large areas of the State out of compliance with the new, tighter standard. Utah's DAQ will have to draw up a plan to achieve the tighter ozone standard.

The figure above shows that the three major sources of NO_x in the State are mobile, non-road, and point sources. Of those sources, mobile and non-road sources are already obligated to make significant sacrifices toward the goal of reduced NO_x pollution. Point sources, including the PacifiCorp fleet, however, are not currently being asked to share in this sacrifice. Utah's DAQ will not be able to meet the new tighter ambient ozone standard without requiring major reductions in the point sources of NO_x. It would be appropriate to recognize that now, in the context of the regional haze rules, so that PacifiCorp will be able to plan accordingly.

Response: EPA appreciates the commenter's statement that environmental protection and economic growth are not necessarily mutually exclusive. We also acknowledge the commenter's concern that reduced ozone concentration can lead to improved employee productivity. However, as described elsewhere, for purposes of this action, EPA is not authorized to consider such potential benefits of reduced ozone, including improved employee productivity in evaluating the SIP and promulgating our FIP, and we have not done so. Further, while EPA generally agrees with the commenter's statement that reduction of NO_x from point sources is

important, EPA takes no specific position as to whether emission reduction of NO_x from certain sources are more important than other NO_x sources in Utah.

Comment: [UPHE, p. 32] With the rapid growth of the population along the Wasatch Front there has been a corresponding rapid growth of automobile exhaust. One of the primary components of automobile exhaust is NO_x. NO_x is a precursor from which haze-generating particulates and ozone form along the Wasatch Front, particularly in the summer. The resulting reddish-brown haze that chronically overhangs Cache, Weber, Salt Lake, and Utah valleys lowers the quality of life of the over 2 million residents of those valleys. In addition, when inhaled, the fine particulate and ozone components of this smog cause chronic, low-level inflammation throughout the body. This impairs the respiratory and circulatory systems of all of the inhabitants of the Wasatch Front, and shortens their lives, including children, the elderly, asthmatics, and the general population. PacifiCorp's central Utah fleet of power plants is responsible for a substantial share of the NO_x, particulates, and ozone along the Wasatch Front. Reducing that share should noticeably improve visibility there at the same time that it improves the health of its residents.

Response: We acknowledge the commenter's concern regarding the effects of fine particulates and ozone exposure on human health. We also generally agree that another major source of NO_x is automobile exhaust. For purposes of this action, however, we are not authorized to consider such health impacts in evaluating the SIP and promulgating our FIP, and we have not done so. Further, emissions of visibility impairing pollutants from sources such as automobile exhaust is beyond the scope of this action and we take no position as to these statements.

Comment: [UPHE, p. 33] Emissions that lead to the formation of NO_2 generally also lead to the formation of other NO_x. Emissions control measures leading to reductions in NO_2 can generally be expected to reduce population exposures to all gaseous NO_x. This has the important co-benefit of reducing the formation of ozone and fine particles, both of which pose significant public health threats. The $77 million annualized expense required to reduce NO_x emissions from PacifiCorp's central Utah fleet of coal plants by 87% should be recognized as a bargain when the substantial health benefits are considered of removing not just NO_x, but of removing the ozone and fine particulates which those NO_x emissions generate.

Response: EPA appreciates the commenter's concerns regarding the negative health impacts of NO_x. We also generally agree that reductions of NO_2 can have the potential benefit of reducing the formation of other NO_x, ozone, and fine particles. While our action concerns visibility impairment, we note this action's potential for significant improvements in human health. For purposes of this action, however, we are not authorized to consider such health impacts in evaluating the SIP and promulgating our FIP, and we have not done so.

Comment: [Transcript pp. 189-190] One commenter presented research on health statistics and asserted that Carbon County is rated 27th out of 27 counties in Utah for the health of its citizens. Its rate of premature deaths is more than twice the national average. Emery County is rated 18th out of 27 counties and its rate of premature deaths of its citizens is about 50 percent higher than

what the national average is, and is much higher than Utah's average. The commenter believes pollution coming from Hunter and Huntington is at least a factor in these statistics and needs to be considered.

Response: EPA appreciates the commenter's concerns related to the negative health impacts of air pollution, particularly in Emery County where the Hunter and Huntington Plants are located. The commenter did not provide enough information for us to adequately respond to this comment. Further, for purposes of this action, we are not authorized to consider such health impacts in evaluating the SIP and promulgating our FIP, and we have not done so.

Comment: Mass mailer commenters asserted that nitrogen oxide pollution from the Hunter and Huntington coal plants in Utah contributes to haze at eight national parks in the Southwest, including Canyonlands and Capitol Reef. That means millions of visitors to these parks annually are exposed to dirty air in the very places that should have the cleanest air.

Response: Comments noted.

Comment: [Transcript p. 91] One commenter noted that SCR technology is required in New England and in Utah's neighboring states of New Mexico, Arizona, Colorado, and Wyoming. Why does the state have to be an outlier when it comes to enacting effective regulation controls on industries whose emissions impact the health and wellbeing of its citizens? Even a place that believes in limited government is supposed to put the health of its citizenry above all else. This commenter and several commenters referenced the drinking water problem in Flint, Michigan as an example of what can happen when the guiding principle of public health is overlooked.

Response: As stated elsewhere in this document, Utah is subject to the same requirements of the Regional Haze Rule as all other states.

Comment: [Executive Director, American Lung Association, Utah, transcript pp. 123-124] One commenter emphasized that the American Lung Association in Utah works very hard to improve lung health and prevent lung disease. The Association knows that climate change can harm public health through degraded air quality, wild fires, drought, heat waves and more. It also knows that climate change worsens symptoms of lung disease amongst the 57,800 children and 177,000 adults that have asthma in Utah.

According to the 2015 State of the Air Report for the American Lung Association, the Salt Lake County area ranked as the seventh most polluted city in the country for short-term particle pollution, followed by Logan, Utah in the eighth position. Uintah County ranked seventh most polluted county for ozone, and Duchesne, Utah, ranked as the 15th most polluted county for ozone. Ozone pollution, also known as smog, is dangerous and sometimes even lethal. It can send people to the emergency room and even cause premature death. High ozone levels can impact anyone's health, but some groups are particularly vulnerable to the health harms from ozone, including children, the elderly, people with asthma and other lung diseases, people with

heart disease and people who work and exercise outdoors, as well as people who have low incomes.

Low income communities have suffered the consequences of pollution exposures from our nation's coal-fired power plants for far too long. They have lived near these plants where they have breathed the worse pollution, including toxic emissions like arsenic, lead, and carcinogens like benzene spewed into the air. They are suffering more from what climate change brings since research shows that air pollution disproportionately harms poorer populations, in part because they are more likely to have diseases like asthma.

Public health is the main reason why the American Lung Association is in favor of revising the state plan to include pollution control measures for Rocky Mountain Power's Hunter and Huntington coal-fired plants.

Response: We appreciate the commenter's support for this action. For purposes of this action, we are not authorized to consider such health impacts in evaluating the SIP and promulgating our FIP, and we have not done so. Further, we address the FIP's potential for disproportionately high and adverse impacts on minority and low-income communities in Utah in the "Environmental Justice" section of this notice.

Comment: [Transcript pp. 178-179] Another commenter shared specific medical costs he had incurred due to asthma and that his emergency room expenses got passed on to everyone in the state. Several other commenters shared personal experiences regarding living with asthma.

Response: Comments noted. We thank those who attended and participated at our public hearings.

Comment: [Transcript pp. 168-169] One commenter asserted that pollution from the Hunter and Huntington plants contributes to 11 premature deaths and 233 asthma attacks every year, according to the Clean Air Task Force.

Response: We appreciate the commenter's concern regarding the negative health impacts of emissions from the Hunter and Huntington power plants. As we state elsewhere in this document, health studies are beyond the scope of this action.

Comment: [Transcript pp. 199-201] One commenter representing the Utah Physicians for a Health Environment noted that the physicians group was profoundly disappointed that Utah has endorsed the plan that does not require SCR installation at Hunter and Huntington. The commenter discussed the considerable economic and human cost to the pollution from these plants in additional to regional haze. The commenter generally cited a 2010 study (no specific citation was provided) tracking deaths, heart attacks, asthma attacks, and hospital admissions precipitated by pollution from just these two plants that concluded the economic repercussion of these outcomes cost the victims 212 million dollars per year including 27 annual deaths. Over 20 years that is over 4.2 billion dollars and 540 lives lost. So DAQ has endorsed a plan that excuses

Rocky Mountain Power from having to spend 340 million dollars but hands to the public a bill of over 4.2 billion and ends the lives of 540 people. The commenter noted these health impacts and costs are underestimated and went on to list other ancillary health impacts precipitated from these plants' pollution as well as other health and environmental impacts due to mercury emissions.

Response: We appreciate the commenters' concerns regarding the negative health impacts of emissions from the Hunter and Huntington power plants. To the extent that this action reduces these emissions, there are co-benefits for public health; however, we are not authorized to consider these impacts in evaluating the State's regional haze SIP and promulgating our FIP, and we have not done so.

Comment: [Transcript p. 209] Two student commenters from the University of Utah discussed air masks issued to students. Through a sustainable campus initiative fund, the Clean Parks Plan, $11,000 was spent on the masks to protect students biking and walking on red quality air days. One of the commenters asserted that implementing the federal plan would represent a statement from the people about the direction they want and that the state has been reluctant to march forward towards a goal that has been stated by our President and many of the countries of the world at the Paris conference. One of the commenters hopes that the Clean Parks Plan will be adopted so he no longer has reasons to wear the air masks just to ride a bike during winter.

Response: Comments noted. We want to clarify that the term Clean Parks Plan was created by conservation organizations as part of public outreach activities without EPA coordination or approval. The term is inconsequential to EPA's action.

Comment: [Transcript pp. 225-227] One commenter who is a firefighter paramedic compared control of NO_x emissions from fire engines in firehouses to the controls in the FIP and asserted that the pollutants from the coal plants are similar to those from fire engines. The commenter described how the walls inside the firehouses stay whiter since the fire engines have been "converted." The commenter noted that fire fighter deaths were directly attributed to the pollutants from the fire engines. The commenter implied that potential health impacts resulting from the coal plants would be reduced under the FIP.

Response: Comment noted.

Comment: [Registration card] One commenter noted that if business (i.e., PacifiCorp) is too motivated by profit rather than the safety and health of the residents they impact with air pollution, then our government (i.e., EPA) must support the health and well-being of its citizens.

Response: Protection of human health and the environment is EPA's mission and forms the basis for many Agency actions, including establishing the National Ambient Air Quality Standards (NAAQS), and promulgation of regulations such as the New Source Performance Standards (NSPS) and the National Emission Standards for Hazardous Air Pollutants (NESHAP). However, as we describe elsewhere in this document, we are not authorized under the Regional

Haze Rule to consider health impacts in evaluating the State's regional haze SIP and promulgating our FIP, and we have not done so. We take no position regarding the remainder of the commenter's synopsis.

Comment: [Registration card] One commenter asserted that the State of Utah is dragging its feet on cleaning the air across the state. It will cost Utahans to do this as the costs of lowering the impact of mining and burning coal are passed on to consumers. But it also costs "down winders." Currently, we all pay for emissions with sickness and aggravated health conditions.

Response: EPA acknowledges the commenter's concerns regarding public health impacts due to exposure to visibility impairing pollutants. For purposes of this action, however, we are not authorized to consider such health impacts in evaluating the SIP and promulgating our FIP, and we have not done so. Further, evaluation of the potential burden of economic and public health costs imposed upon consumers and "down winders" is beyond the scope of this action and we take no position with the commenter's statement.

Comment: [Transcript p. 71] One commenter noted that if you really want to cure the health issues attributed to air pollution, there should be a great campaign to get rid of smoking.

Response: Comment noted.

c. Tourism

Comment: [Conserv Orgs, p. 4] In 2012, visitation at Utah's national parks was at an all-time high with nearly 7 million visits. Visitation to Utah's national parks has increased 175 percent from 1980 through 2012. Canyonlands (702 %) and Arches (269%) National Parks, the two parks most severely impaired by emissions from Utah's BART units, saw the fastest visitation growth over this time period. Utah's five Class I areas, all of which are national parks, generate a significant portion of this tourism economy: in 2008, these areas were responsible for 5.7 million recreation visits, over $400 million in spending, and nearly 9,000 jobs.[591] Parks attract businesses and individuals to the local area, resulting in economic growth in areas near parks that is an average of 1 percent per year greater than statewide rates over the past three decades.[592] National parks also generate more than four dollars in value to the public for every tax dollar invested.[593] The economies of nearby communities and "gateway" towns, including places like Springdale, Panguitch, Escalante, Loa, Torrey, Moab and Hanksville depend heavily on visitation to these Class I areas.

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[591] Daniel J. Stynes, Michigan State University, *National Park Visitor Spending and Payroll Impacts, 2008* (Oct. 2009), available at http://web4.msue.msu.edu/mgm2/parks/MGM2System2008.pdf.
[592] Hardner and Gullison, *The U.S. National Park System, An Economic Asset at Risk* (Nov. 2006),[prepared for the National Parks Conservation Association] available at http://www.npca.org/park_assets/NPCA_Economic_Significance_Report.pdf
[593] *Id.*

Response: We agree that there are potential positive benefits to the local and national economies in our proposal and we do expect that improved visibility would have a positive impact on tourism-dependent local economies.

Comment: [Conserv Orgs, p. 5] The visual range in western national parks has decreased from 140 miles to 35-90 miles.[594] Studies have shown that visitors value clean air in our national parks, are able to tell when it is hazy, and enjoy their visit less when haze is bad. Moreover, visitors are willing to alter their length of stay based on their perception of air quality.[595] Shorter park visits, or none at all, means less time and money spent in gateway communities.

Response: As previously stated, we agree that there are potential positive benefits to the local and national economies in our proposal and expect that improved visibility would have a positive impact on tourism-dependent local economies as well as provide a better experience for those visiting in western national parks.

Comment: [Conserv Orgs, p. 48] We concur with EPA's conclusion that "nothing in the CAA suggests that visitors during busy time periods are entitled to experience better visibility than visitors during off-peak periods."[596] According to Utah, lower winter visitation means that the benefits of SCR should be discounted. This position finds no basis in the Clean Air Act, which does not tether the visibility improvement mandate to a threshold number of visitor experiences. To the contrary, Congress "declare[d] as a national goal the prevention of *any* future, and the remedying of *any* existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution." 42 U.S.C. § 7491(a)(1) (emphases added). In any event, as discussed above, Hunter and Huntington NO_x emissions cause visibility impacts at all times of the year, not just in the winter, regardless of the variable magnitude of those impacts.

Response: We agree with the commenter.

Comment: [UPHE, p. 16] Currently, the Park Service notes, the Colorado Plateau's Big 5 national parks are so heavily polluted that the odds that a traveler will be able to view these parks haze free is no better than one day in four. This means that the odds that a traveler will receive full value for the time and money that he or she has invested in visiting any of the Big 5 is 25% or less. According to the Park Service, the Big 5, on average, is obscured by haze 75% of time, and its crown jewel (Zion) is obscured by haze 80% of the time.

The Big 5 is a unique concentration of natural wonders that is unmatched anywhere else in the world. Their enormous cultural and economic value, however, is far less than what it could be if it were not for the polluted air in which they are chronically engulfed. Laboring under that handicap, it is remarkable to think that they bring in $750 million a year. Think of what they would be worth to the State if the percentage of the time that those 5 renowned national parks

[594] US EPA, *Visibility and Regional Haze* Homepage, available at https://www.epa.gov/visibility.
[595] Abt Associates Inc., Out of Sight: The Science and Economics of Visibility Impairment (Aug. 2000).
[596] 81 FR 2004, 2024 (Jan. 14, 2016).

could be experienced haze free could be doubled from the current one-fourth of the time to one-half of the time. It is not unreasonable to think that that might double their economic worth to our State—adding another $750 million each year to Utah's economy--as satisfied visitors report back to their home state or home country that they have at least an even chance of seeing the natural spectacle that they came to see.

Response: As previously stated, we agree that there are potential positive benefits to the local and national economies in our proposal and expect that improved visibility in the Big 5 would have a positive impact on tourism-dependent local economies.

Comment: [UPHE, p. 21] It should be noted that these visitation data are 12 years old and have become obsolete. Tom Till is a renowned professional photographer and guide headquartered in the Moab area. He has spent over 40 years practicing his trade. His comments, filed today in this docket, note that tourism in the iconic parks and wilderness areas around Moab has markedly increased in winter over the last five years, especially among international tourists from Europe and Asia.

Since the purpose underlying the regional visibility provisions of the Clean Air Act is to restore the aesthetic values associated with the America's parks and wilderness areas, his observations about the special quality of light and the purity of color that are obtainable on the Colorado Plateau primarily in winter should be carefully weighed by the EPA in making its decision about which of its co-proposals to adopt. His views about the unique aesthetic values of touring the Colorado Plateau in winter are echoed by another renowned professional photographer headquartered in Springdale. Malin Moench, an amateur photographer, affirms that view. He observes that nitrogen dioxide primarily absorbs blue light. Therefore, he notes, when the concentration of nitrogen dioxide spikes dramatically in the winter over the southern half of the Colorado Plateau, it turns the atmosphere reddish brown. This, he notes, dulls the otherwise high contrast between blue sky and red rock that makes the southern half of the Colorado Plateau world famous among photographers and travelers.

Response: We appreciate the statements by the commenters and agree that the (secondary) objective of the Clean Air Act is to restore non-health issues such as aesthetics.

Comment: [UPHE, p. 53] It should be born in mind that our estimated benefits of installing BART are underestimates because they do not reflect the commercial value of achieving significant improvements to the clarity and color of the Big 5 national parks. Tourism and adventure travel to those attractions is currently discouraged by the reality that visitors have only one chance in four of experiencing those attractions on a relatively clear day. Installing BART would significantly improve those odds compared to the status quo, and could be expected to increase the $750 million in revenue that travel to the Big 5 currently add to Utah's economy. If the improved clarity of the air over those parks were to stimulate tourist spending by only 1.2% (as it almost certainly would), the total annual economic benefits of installing BART NO_x controls on the PacifiCorp fleet would exceed the annual costs.

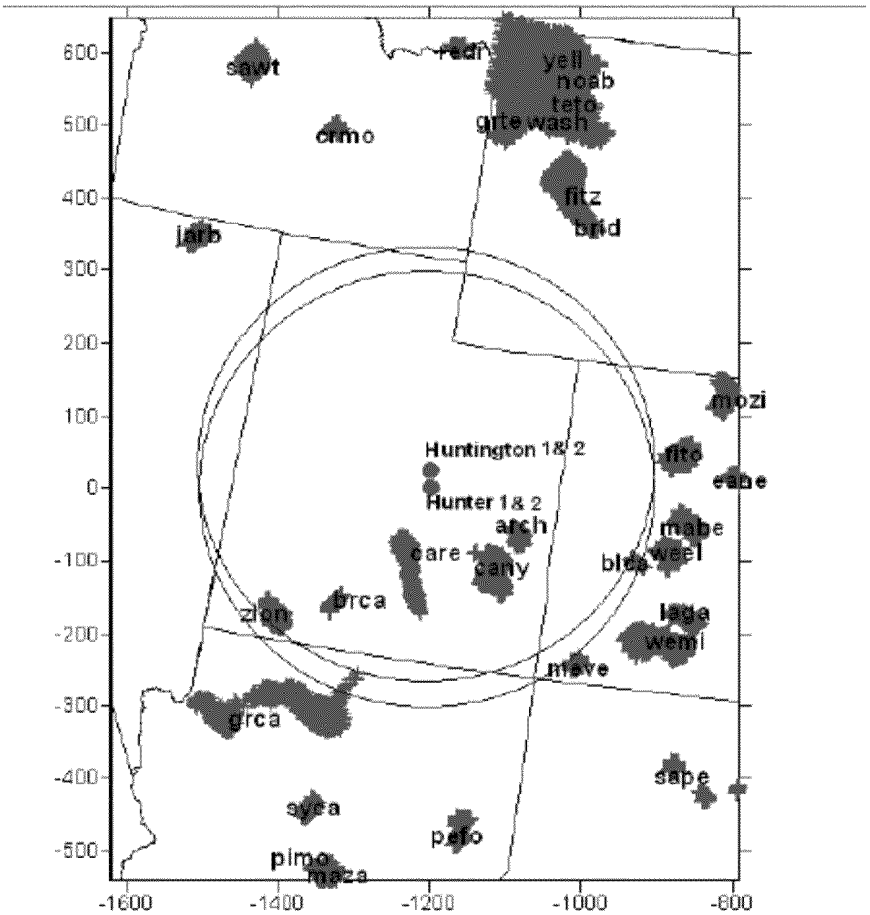
Response: We acknowledge the commenter's concern regarding the impacts on tourism and the added benefits of BART controls to improve Utah's economy. We address BART elsewhere in this document and the FRN. For purposes of this action, we are not authorized to consider tourism in evaluating the SIP and promulgating our FIP, and we have not done so.

Comment: [UPHE, p. 30] As noted above, the Colorado Plateau's Big 5 national parks are world renowned, yet are so heavily polluted that the odds that a traveler will be able to view them on a haze-free day is only one in four. In other words, the chance that the traveler will receive full value for the time and money that he or she has invested in visiting any of the Big 5 is no better than 25%.

The enormous cultural and economic value of the Big 5 to the State of Utah is far less than what it could be if it were not for the polluted air in which they are chronically engulfed. Laboring under that handicap, it is remarkable to think that they still bring in $750 million a year. If the percentage of the time that those national parks could be experienced haze free could be doubled from the current one-fourth of the time to one-half of the time, it could, conceivably, double their economic worth—adding another $750 million each year to Utah's economy as a higher percentage of satisfied visitors report back to their home state or home country their success in actually seeing the natural spectacles that they came to see.

An annual cost of $77 million (and the rate increase of 3.76% that it implies) would seem to be a bargain, considering how much closer it might bring the Big 5 national parks (not to mention other famous Colorado Plateau tourist attractions such as Kolob Canyon, Cedar Breaks, Capital Reef, Lake Powell, and Monument Valley) to realizing their cultural and economic potential.

Seventy seven million dollars per year would seem to be all-the-greater bargain when it is recognized that an 87% reduction in NO_x emissions at the PaciCorp units subject to BART would substantially improve visibility across the entire state of Utah, including the heavily-populated Wasatch Front. Both the EPA and DAQ agree that haze-generating pollution from PacifiCorp's central Utah fleet travels at least 300 kilometers in all directions from those plants. The area affected is illustrated by the figure below.



Response: We appreciate commenter's thoughts on the potential positive benefits to the local and national economies in making our proposal and we do expect that improved visibility would have a positive impact on the cultural and tourism-dependent local economies. For purposes of this action, we are not authorized to consider tourism in evaluating the SIP and promulgating our FIP, and we have not done so. We agree that the NO_x reductions realized at the Hunter and Huntington facilities as the result of our FIP will result in substantial visibility benefits. Refer to the FIP section of our proposed rule for the visibility improvements that are anticipated from the installation of SCR (with combustion controls) for the Hunter and Huntington BART units.

Comment: [Docket ID -0103, -0105] As stated in their testimony the parks administrators stated the park visits have gained visits by 18% each year for the last 5 years and expects a 20% increase this year. That is an increase of over 100%. What is being done to protect the parks from this extra pollution? Maybe tourism should be limited to 2000 numbers. The directors' numbers show a reason for alarm. Has the pollution from this extra visiting been monitored? Limited access should be considered.

One commenter noted the irony in placing any concern on "park visitors," who invariably arrive to the parks in fossil-fuel-run vehicles... vehicles which pollute and also perpetuate the need for these discussions. The commenter asked that EPA keep in mind people who truly reside and play in these areas, not just the tourists. The commenter also expressed concern about the animals and delicate ecosystems.

Response: We appreciate the comments provided regarding visitors to the parks. Consideration is not given, more or less, to the increase or decrease of park visits in making our proposal, but to the impacts these pollutants have on visibility in the parks and implementing a plan to remedy those effects.

Comment: [Docket ID -0106] Utah's outdoor recreation and tourism industries bring in $12.2 billion dollars per year. It's important to clean up the air around the parks and reduce the emissions from coal burning power plants.

Response: We acknowledge the commenter's concern regarding the impacts on tourism. For purposes of this action, we are not authorized to consider tourism in evaluating the SIP and promulgating our FIP, and we have not done so. We expect that improved air quality and reduced emissions would ultimately have a positive impact on tourism-dependent local economies.

d. Visibility

Comment: [SCCAW, written hearing statement] Mentioned visit to Capitol Reef on January 22 and clear views. They visit frequently. Others may not have the view of these vistas if they cannot visit as frequently.

Response: Comment noted.

Comment: [SCCAW, written hearing statement] Commenter explained that Flat Tops appears to have clearer views in both the SIP and FIP analyses because of its higher elevation. Pollution ceilings in the southwest tend to peak around 7,500 ft above sea level.

Response: We disagree with the commenter's analysis that Flat Tops appears to have clearer views in the SIP and FIP analyses due to elevation.

Comment: Many mass mailer commenters described clean air and clear views of Utah's iconic beautiful landscapes as being very important to them.

Response: Comments noted.

Comment: Mass mailer commenters supported strong pollution cuts from Utah's biggest sources of air pollution: coal-burning power plants. Commenters state that we have an opportunity to address air pollution through Utah's Regional Haze plan. The plan is designed to

limit tiny but dangerous airborne particles from coal plants which cause serious health problems and reduce visibility in our national parks and beyond.

Response: We appreciate the commenters' concerns regarding health and coal-burning power plant impacts of haze-causing pollutants and responded to these concerns elsewhere in this document.

Comment: [Transcript pp. 63-64] One commenter noted that he has noticed haze worsening over the years and impacting views at national parks. He provided several examples including Waterpocket Fold in Capitol Reef National Park, ridges around San Rafael Swell, and the rims around Moab above Canyonlands, etc. The commenter said it was obvious that haze was coming from Highway 10 corridor where the power plants are located.

Response: We agree with the commenter that haze has worsened and impacts visibility in the national parks. Refer to the final rule for our summary of the visibility impacts from the Utah BART sources, as well as the visibility improvements anticipated from our FIP action.

Comment: [Transcript pp. 95-97] One commenter advocated people using social media to post photographs when conditions are poor in comparison to the few days the air is clearer. The commenter believes he is complicit in providing views on social media that are less than accurate by sharing views in photographs that the average visitor will only see 25 percent of the time. Statistics and data are very important to quantify what is happening. But on visual resources, the photograph is much easier to digest.

Response: Comment noted. We agree that photographs cannot and should not be used to accurately measure air quality nor visibility, as they can be easily manipulated.

Comment: [Division Chief for Natural and Cultural Resources at Zion National Park, transcript pp. 133-135] One commenter discussed that Zion was the first national park unit established in the state of Utah over 100 years ago, initially as a national monument and later elevated to national park status. The commenter provided excerpts from the legislation regarding the value of Zion. The commenter discussed air quality and airborne toxins at the park. He provided information on elevated mercury concentrations in fish. He urges EPA to take measures to ensure that Utah's regional haze SIP be one that is to remedy existing visibility impairment and restore air quality for the benefit of local residents, park visitors and the protection of park fundamental resources and values.

Response: Comment noted.

Comment: [Superintendent at Capitol Reef National Park, transcript, pp. 136-138] One commenter quoted geologist Clarence Dutton regarding his eloquent impressions of the valley in 1877 and generally described experiences of other visitors. Last year 988, 516 visitors traveled to Capitol Reef National Park, which might be an unforgettable, once-in-a-lifetime experience for some. This is an 18 percent increase over previous years' visitations, for the third year in a row,

and we certainly expect to see the same increase in 2016 as we celebrate the National Park Service' 100th anniversary. The commenter noted that unfortunately, monitoring data indicates the visibility and the clarity of distant views are impaired by anthropogenic haze approximately 79 percent of the time, relative to the annual average level of natural haze. Noted that clean, clear air contributes to the brilliant night skies that make Capitol Reef an international Dark Sky Park. The commenter supports installation of additional NO_x controls.

Response: Comment noted. Refer to the final rule for our summary of the visibility impacts from the Utah BART sources, as well as the visibility improvements anticipated from our FIP action.

Comment: [Superintendent for the National Parks Service at Arches and Canyonlands National Parks, transcript, pp. 138-140] A commenter spoke about the essential role of clean, clear air at the national parks, particularly to Arches and to Canyonlands National Parks which on a clear day offer some of the most spectacular scenic views in the country, and which are now among those in Utah most adversely affected by regional haze. Modeling indicates that NO_x emissions from the Hunter and the Huntington power plants cause that impairment about 20 percent of the time it exists, and contribute to that impairment most of the rest of the time. So looking to the future, with the installation of SCR on the four units of Hunter and Huntington, we would expect to see substantial improvement, also shown in the modeling, with visibility impairment reduced by about 60 percent on the worst days, and significantly reduced on most if not all of the other days. The costs of SCR for Hunter and Huntington are similar to those costs of the surrounding states and are reasonable. The proposed alternative provides no improvement over current conditions. Recommends that EPA take the step of requiring installation of NO_x reduction at Hunter and Huntington.

Response: We thank those who attended and participated at the public hearings and acknowledge the commenter's support for clean air at Arches and Canyonlands National Parks. As stated elsewhere in this document, overall nitrate extinction at the affected areas is significant, particularly on the 20% worst days. As can be seen from Tables 6 and 7 in our final rule, the baseline visibility impacts in dv at all nine Class I areas are large. For Hunter, Arches and Canyonlands are two of the three most impacted national park areas with baseline visibility impacts of 4.601 dv and 5.356 dv, respectively. The visibility benefits of BART (SCR + LNB/SOFA) at Arches and Canyonlands National Parks are correspondingly large at 2.620 dv and 2.948 dv, respectively.

Comment: [NPCA, transcript pp. 159-161] A commenter representing NPCA explained that NPCA is a nearly 100-year-old organization long committed to conservation and protection of our country's national parks and their resources and that they have more than 1 million members and supporters across the country. Everyone from PacifiCorp to the state and EPA to the National Park Service and other public interest groups like NPCA acknowledge that pollution from Hunter and Huntington contribute to haze in eight national parks, including Utah's mighty five, Arches, Canyonlands, Bryce, Capitol Reef and Zion, as well as Grand Canyon, Mesa Verde and Black Canyon of the Gunnison National Park. This pollution obscures up to 87 miles of the landscape that should be visible through Delicate Arch at Arches National Park, and from the

Island in the Sky viewpoint at Canyonlands. PacifiCorp should be held to the same standards as over 250 similar facilities across the country which are required to operate selective catalytic reduction to cut NO_x pollution. The commenter asked the EPA to reject the State's alternative proposal. It would cut zero visibility-impairing pollutants from two of the state's largest coal plants polluting our parks and unjustly claim that pollution reductions already achieved by the closure of the Carbon plant are a victory for our future and victory for the parks. The alternative is a lost opportunity, not a victory. The commenter described a day at Capitol Reef last year with her family where views were impacted by haze. She acknowledged that the coal pollution alone did not cause that level of haze. But with Capitol Reef less than 85 miles from Hunter and Huntington, it was likely a contributing factor. We have the opportunity to remove it from the equation. Living in Utah, her family will probably have another chance to see Capitol Reef, hopefully on a clear day. But many visitors only get one chance to create those memories. Many other commenters expressed similar opinions.

Response: We thank those who attended and participated at the public hearing and acknowledge the commenter's support for clean air at Utah's five national parks. We agree that coal-burning power plants contribute to haze in and around the national parks. Refer to the final rule for a summary of the visibility improvements anticipated from our FIP action.

Comment: Many commenters at the public hearing who support the proposed FIP discussed moving to Utah from other parts of the country to enjoy convenient access to Utah's national parks and expressed general concern that the SIP does not offer adequate protection of the parks' scenic views.

Response: We appreciate the commenters' support of the FIP.

Comment: [Registration card] One commenter noted that with wintertime temperature inversions people seem increasingly desperate for clean air. The commenter suggested that National Parks are a way to escape bad air and does not want to see any more spaces suffer from air pollution. These spaces need as much protection as possible especially in regards to air quality.

Response: Comment noted. The objective of the regional haze program is to improve and protect visibility in national parks and wilderness areas, as well as the State of Utah.

Comment: [Transcript p. 145] An Emery County commissioner noted that according to the regional health department there have been no deleterious health effects to the citizens of Emery County caused by the Hunter and Huntington power plants. Since these power plants are located within Emery County's borders, it would seem logical that Emery County would have the highest haze levels from these power plants. But the blue skies there say otherwise. There is no evidence that the haze over these Class I areas comes from Huntington and Hunter power plants. There is only speculation, model, and anecdotal information that this is the case.

Response: For purposes of this action, we are not authorized to consider health impacts in evaluating the SIP and promulgating our FIP, and we have not done so. Refer to the final rule for our summary of the visibility impacts from the Utah BART sources, as well as the visibility improvements anticipated from our FIP action.

Comment: [Transcript pp. 120-122] One commenter asserted the main justification for the EPA's proposed takeover of the regional haze plan from the state is based on the 98th percentile deciview impact at the Class 1 air sheds in question. 1 deciview correlated to the relative change the human eye can perceive. Referring to Tables H.5-H.8 in Utah's modeling summary, 6 of the 9 Class I areas have substantially less than 1.0 dv modeled improvement on the worst of days. At Canyonlands, the most impacted area in the model, the sum of modeled improvements for all the proposed units is only 2.3 dv on the worst day of the year. These days occur in winter months when the "visitorship" of the Parks is lowest. In EPA's proposed action for installing SCR technology at the Hunter and Huntington plants, the average improvement using the BART baseline over the state's BART alternative is a paltry 0.14 dv. Commenter opined that since the improvement from SCR is not perceptible to the human eye and has no human health impact, the cost of $700 million is too burdensome.

Response: We have the duty to ensure that regional haze SIP submittals meet the requirements of the Act and the Regional Haze Rule. Our rationale for using the 98th percentile as a key metric in evaluating Utah's SIP is explained elsewhere in the document.

Comment: [Docket ID -0094] Have you been to Carbon or Emery County? We have blue skies with no haze or pollution. Maybe you should visit the area and see for yourself before making judgement. (Many commenters have made similar comments.)

Response: We appreciate these comments, but they have no bearing on the proposal.

e. Modeling, General

Comment: The omission of important information from the model such as location of highways, mobile sources, and populated areas, relative to the national parks, supports faulty findings and promotes an agenda directed against coal fired power.

Response: As stated elsewhere, EPA's action is based on its careful consideration of the BART Alternative and BART Benchmark as allowed in the CAA and related statutory and regulatory requirements. Specifically, for the reasons discussed elsewhere in this document, the modeling for this action was focused only on BART sources. In addition to the emission rate for those sources, CALPUFF's other input data are meteorological data, stack parameters, source location and a variety of other values related to ozone background, ammonia, etc… CALPUFF is not designed to account for location of highways and populated areas. Although technically, CALPUFF has the ability to treat mobile sources (i.e. emissions could be treated as area sources), other air quality models would be more appropriate to use to account for the air

pollution from these sources. Our response to the inclusion of vehicle emissions in this action is found elsewhere in this document.

Comment: [Transcript pp. 114-115] The commenter discussed that CALPUFF modeling omits important information from the model such as locations of highways, mobile sources and populated areas relative to national parks. The modeling supports faulty findings and promotes an agenda directed toward coal-fired power. Section 5.1, paragraph 2 of EPA's modeling protocol admits but fails to include in the modeling the following statement from EPA's proposed rule, "We further propose to recognize that not all pollutants impact visibility equally, and that the total emissions reductions of all pollutants is not necessarily a direct indicator of whether the BART alternative or the BART benchmark will achieve greater reasonable progress." The EPA's rejection of the State's SIP is focused on the wrong contributor. The model's results demonstrate a change in measurable haze at the power plants, but provide no commonly known scale to demonstrate the overall reduction in the regional haze. Justification for additional restrictions (i.e., installation of SCR) have been primarily based on these assumptions and models.

Response: Our responses to the commenter's assertions with respect to CALPUFF input data, the inclusion of vehicle emissions, and the comparison of annual emissions reductions are all found elsewhere in this document.

f. Cost

Comment: Mass mailer commenters asserted that the pollution controls that the EPA has proposed are extremely cost-effective, would reduce nitrogen oxide pollution at the Hunter and Huntington plants by an additional 80 percent, and have been required at more than 200 power plants nation-wide.

Response: We appreciate the comments. We have done a cost analysis and compared the cost-effectiveness and visibility benefits of SCR + LNB/SOFA with BART determinations elsewhere and have concluded that that BART is SCR + LNB/SOFA for the Hunter and Huntington BART units.

Comment: [Registration card] One commenter wrote that most of the arguments in favor [of the FIP] seem to be categorically in favor of all restrictions at any cost. If technology is developed [in the future] that will create meaningful [visibility] improvement [the new technology may not be affordable] as then the money will already [have been] spent [on the old emission control technology].

Response: We disagree with this comment. We considered the costs of compliance for SCR + LNB/SOFA and find them to be reasonable and in line with costs that have been found to be BART elsewhere. Future visibility improvement will be addressed by the reasonable progress portions of the visibility program.

Comment: [Transcript p. 113] One commenter suggesting letting the national parks pay for expense of more controls since it was already mentioned how much profit they bring in.

Response: We disagree with this comment. We note that the National Park Service, as a federal agency, does not profit from attendance at its parks. Under the Federal Recreation Lands Enhancement Act, entrance fees are generally used for projects within the parks that have not been otherwise funded, and as a general matter these projects benefit park visitors or the parks themselves. We also note that many recreational and tourism businesses, which do indirectly profit from attendance at National Parks, are generally supportive of improving visibility at Class I areas. In any case, it is not within EPA's authority to require the Park Service to pay for pollution controls.

g. Other

Comment: Many commenters referred to EPA's proposed FIP as the "Clean Parks Plan."

Response: EPA acknowledges the commenters' preference to use this terminology. We want to clarify that the term Clean Parks Plan was created by conservation organizations as part of public outreach activities without EPA coordination or approval. The term is inconsequential to EPA's action.

Comment: [Conserv Orgs, p. 5] In rigorously addressing visibility and, more specifically, haze-causing pollutants, Utah stands to reap significant benefits. Haze-causing pollutants have far-reaching impacts on human health, and the well-being of waterways, soils, plants, and wildlife—in other words, entire ecosystems. Decreasing these pollutants will likely benefit all of these important areas of concern; failing to do so will likely cause or continue to cause adverse impacts.

Response: We appreciate the commenter's concern regarding health and ecosystem impacts of haze-causing pollutants and responded to these concerns elsewhere in this document.

Comment: [Conserv Orgs, p. 8] The same haze-causing emissions harm terrestrial and aquatic plants and animals, soil health, and moving and stationary waterbodies—entire ecosystems—by contributing to acid rain, ozone formation, and nitrogen deposition. Nitrogen deposition, caused by wet and dry deposition of nitrates derived from NO_x emissions, causes well known adverse impacts on ecological systems. Scientific investigations have already demonstrated that nitrogen is saturating the soil, plants and water of Rocky Mountain National Park at levels at least twice the "critical load" the ecosystem can tolerate.

Further, ground level ozone formation impacts plants and ecosystems by:

- interfering with the ability of sensitive plants to produce and store food, making them more susceptible to certain diseases, insects, other pollutants, competition and harsh weather;

- damaging the leaves of trees and other plants, negatively impacting the appearance of urban vegetation, as well as vegetation in national parks and recreation areas; and
- reducing forest growth and crop yields, potentially impacting species diversity in ecosystems.[597]

Response: We appreciate the commenter's concern regarding the negative potential ecosystem impacts, including nitrogen deposition and ground-level ozone formation, of certain emissions and respond to ecosystem impacts elsewhere in this document.

Comment: [Conserv Orgs, p. 48] Utah failed to note that the rule is now more than eight years behind schedule because of Utah's litigation and delays.

Response: We take no position regarding the commenter's synopsis.

Comment: [UPHE, p. 7] One aspect of the debate over Utah's revised SIP that has not received sufficient attention in prior comments is the fact that the generation capacity that was lost to PacifiCorp when it closed the Carbon complex has to be replaced by power generated by another source (unless, of course, the amount of power that Rocky Mountain Power supplies its market has since been cut by the amount that the Carbon complex once supplied). Replacing this lost capacity will have a cost to PacifiCorp. It will also generate pollution in place of the pollution that was formerly emitted by the Carbon complex. How much pollution will be generated by replacing the lost production will depend on the source of that replacement power.

Response: Our response to the consideration of replacement power is found elsewhere in this document.

Comment: [UPHE, p. 7] If the generating capacity that was lost by retiring the Carbon complex is replaced by ramping up the utilization rate of PacifiCorp's remaining fleet of coal-fired power plants in Central Utah, there will be little if any net reduction in pollution or haze brought about by Utah's "alternative program." To ensure that baseline pollution and the associated haze would be reduced by the full amount for which Utah is taking credit with its "alternative program," the alternative program would have to include an enforceable commitment on the part of PacifiCorp to obtain an equivalent amount of replacement power from a non-polluting source (i.e., utility-scale wind or solar). Another way of achieving this result would be including in the "alternative program" a commitment to implement an energy conservation program designed to ensure that the generating capacity lost by closing the Carbon complex would not need to be replaced.

Response: The CAA does not require an analysis of the statutory factors to include the consideration of hypothetical emissions increases at other facilities or even at the same facility due to lost capacity. Any new or modified emissions units constructed in the future would be subject to other CAA provisions. Moreover, all emission units would be subject to analysis under the regional haze requirements for reasonable progress in future planning periods.

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[597] US EPA, *Ozone Pollution*, available at https://www.epa.gov/ozone-pollution.

Comment: [UPHE, p. 7] Under its first co-proposal, the EPA would agree with Utah that its SIP obligating PacifiCorp to keep a power plant in retirement that is not covered by the regional haze rule can qualify as an "alternative plan" for meeting that rule. The EPA also would agree that such an "alternative plan" can take full credit for the amount of haze-causing pollution that closing the non-covered plant avoids. But if both of these assertions are valid, it must also be valid to include in that alternative plan an enforceable commitment to replace the generating capacity lost with an equal amount of power generated by a non-polluting source, whether or not that non-polluting source is subject to the regional haze rule.

Response: We disagree with the commenter's logic statements regarding an enforceable commitment to replace capacity lost at the Carbon power plant with power generated by a "non-polluting source". It is outside the scope of the Regional Haze Rule to require an enforceable commitment to replace generating capacity that may be lost within the construct of BART with power generated by a less-polluting source.

Comment: [UPHE, p. 8] The compliance issues raised by Utah's "alternative program" to installing BART NO_x controls on plants that are subject to BART are very similar to the compliance issues raised by the EPA's Clean Power Plan. That plan requires each state to reach a targeted reduction in CO2 emitted by its electric power sector by a specified year. The target can take the form of an emission-rate reduction or a total mass reduction.

Under the Clean Power Plan, there are three "building blocks" that a state can use to reach its assigned target—1) make efficiency improvements to coal- and gas-fired power plants, 2) substitute a less polluting fuel (natural gas) for coal, 3) substitute renewable power capacity for either coal or natural gas. A state can also devise plans to reduce power demand through energy efficiency programs and get credit toward its CO2 reduction target.

Because the Clean Power Plan implements section 111(d) of the Clean Air Act, it only covers existing sources of CO2. This creates an awkward regulatory boundary between regulating CO2 from existing power plants and new power plants. A major issue in designing state plans to achieve their assigned targets is whether those plans would encourage "leakage." Leakage would occur if existing emitters within a state build new generating facilities, increasing their CO2 emissions without penalty, while still getting full credit for applying the CO2-reducing building blocks to their existing facilities. An economically rational program would cover both existing and new sources of CO2 in a comprehensive way.

Response: Our responses related to the Clean Power Plan in general are found elsewhere in this document. Comments and associated responses regarding specific aspects of the Clean Power Plan are outside the scope of this rulemaking.

Comment: [UPHE, p. 9] An economically rational program would require that crediting utilities for the pollution reduced when non-BART plants are closed would offset those credits by the pollution associated with replacement capacity. If a commitment by Rocky Mountain Power to

supply replacement capacity from a non-polluting source were added to Utah's "alternative program," that program would still not be effective unless there were also a requirement that the non-polluting source be "surplus" to the inventory of clean power sources that Rocky Mountain Power already has, or plans to acquire, apart from the need to comply with the regional haze rule. Otherwise, the commitment to supply replacement capacity from a clean power source could be evaded simply by labelling a source that is already in use or in the investment pipeline as the one supplying the replacement capacity. The level of renewable power sources and demand reduction programs identified in the "preferred alternative" scenario in Rocky Mountain Power's 2015 Integrated Resource Plan could provide an appropriate baseline from which to determine whether Rocky Mountain Power will obtain its replacement capacity from clean sources that are "surplus" to the clean power sources that it would otherwise use.

Response: As stated elsewhere in this document, States can implement an alternative to BART; however, EPA cannot do so, at least not unilaterally. We take no position on the commenter's synopsis.

Comment: [UPHE, p. 10] There are other practical considerations that add to the appeal of adopting the Utah SIP if it is coupled with a commitment to obtain clean replacement power. The EPA's second co-proposal (to apply BART NO_x controls to PacifiCorp's plants subject to BART) would give PacifiCorp five years to complete the required installations. This a long delay before the desired improvement in visibility is achieved. The five-year lead time for planning and building 189 Megawatts of additional solar or wind capacity (matching the capacity of the retired Carbon complex) is considerably more than the one-to-two-year lead time that is typically required to plan and build utility-scale renewables.[598] Rocky Mountain Power could also buy the appropriate increment of power from renewable sources on the wholesale power market, and reduce the output of its central Utah fleet by a comparable amount. This approach would not require any appreciable lead time. This approach, however, would require a commitment by Rocky Mountain Power to offset the incremental renewable power purchased by corresponding reductions in output from its coal-fired power fleet in central Utah.

Response: We do generally acknowledge that many kinds of renewable energy do not produce haze-causing pollutants, and transitioning to those sources of energy could lead to visibility improvements. However, in this action we are required to review specific retrofit options for specific sources subject to BART and the State's BART Alternative. Renewable energy technology is not a retrofit option for these sources and is outside the scope of our determinations and regulatory requirements in this action.

Comment: [UPHE, p. 10] Another practical consideration that adds to the appeal of adopting the Utah SIP if it is coupled with a commitment to obtain clean replacement power is that it

[598] See *The Clean Energy Case for Transmission Has Never Been* Stronger, Greentech Media (July 10, 2015), available at http://www.greentechmedia.com/articles/read/the-clean-energy-case-for-transmission-has-never-been-stronger (noting that if there is a need to also build major new transmission facilities to connect the renewables to their markets, the lead time can be considerably longer).

might be considered to be more economically efficient than requiring Rocky Mountain Power to install BART NO_x controls. The following table summarizes estimates of the capital and annual cost of installing BART on RMP's four eligible generating units that appear in the EPA's Notice of Proposed Rulemaking.

Response: Our response to the inclusion of "clean replacement power" within the State's SIP is found elsewhere in this document.

Comment: [UPHE, p. 33] Coal fired power plants are the primary source of NO2 in the atmosphere. Under the right conditions, ultraviolet energy can split an oxygen atom from NO2, freeing it to combine with O2 to form ozone (O3). This process makes NO2 the primary source of ground-level ozone in the environment. For a given level of volatile organic compounds (VOCs) in the atmosphere, ozone production will rise as the concentration of NO2 rises, and then fall as concentrations of NO2 continue to rise.

Response: We agree with the commenter that NO_x emissions contribute to the formation of ground-level ozone.

Comment: [UPHE, p. 54] The better alternative to installing BART NO_x controls on those power plants, however, may be to revise Utah's "alternative program" to installing BART to bring it into compliance with the regional haze rule. To do that, it would be necessary to include in the alternative program, an enforceable commitment from Rocky Mountain Power to obtain the generating capacity that was lost by retiring the Carbon complex with equal capacity from non-polluting sources (utility-scale solar or wind facilities) or with an energy efficiency program designed to reduce demand for power by the amount that was formerly supplied by the retired Carbon complex. This could be done at substantially lower cost than installing BART ($910 million vs $1.5 billion) while achieving essentially the same improvement in visibility.

Response: While EPA cannot propose a BART Alternative FIP, States can, as Utah did, implement an alternative measure rather than to require sources subject to BART to install, operate, and maintain BART. Although ultimately we are disapproving certain elements of the State's BART Alternative, additional energy efficiency measures could be achieved in the future.

Comment: [UPHE, p. 55] In addition, a revised "alternative program", would have health and productivity benefits comparable to those of installing BART NO_x controls, due to the associated reduction of NO_x, SO_x, ozone, and $PM_{2.5}$. A rough estimate of the value of these benefits is provided by the current that the social cost of carbon, which most studies estimate is approximately $50 per ton of CO_2. When the Carbon complex was in operation, it emitted 1,536,505 tons of CO_2. The social cost of carbon is more than 90% attributable to the harm that burning coal causes to public health. At $50 per ton of CO_2, the costs that society avoids by retiring the Carbon complex (if the replacement capacity is from a non-polluting source) would come to $76,825,250 annually. By coincidence, this social benefit from a revised "alterative program" would equal the annualized cost of installing BART ($76.89 million).

Response: We appreciate the commenters' concerns regarding the negative health impacts of emissions from the Hunter and Huntington electrical generating units (EGUs). We agree that the same PM2.5 emissions that cause visibility impairment can be inhaled deep into lungs, which can cause respiratory problems, decreased lung function, aggravated asthma, bronchitis, and premature death. We also agree that the same NO_x emissions that cause visibility impairment also contribute to the formation of ground-level ozone, which has been linked with respiratory problems, aggravated asthma, and even permanent lung damage. As we state elsewhere in this document, health studies are beyond the scope of this action. The commenter does not provide enough explanation on "societal costs" factors for EPA to respond beyond our responses provided elsewhere.

Comment: [SCCAW] One commenter discussed accumulation of pollution from coal-fired power plants over time into environment and secondary effects to property.

Response: The commenter did not provide enough information for us to adequately respond to this comment.

Comment: [Transcript pp. 186-187] One commenter discussed the effects of nitrogen deposition from coal-fired power plants on desert ecosystems not only in Utah but throughout the Colorado Plateau. The commenter asserted that additional pollution controls would reduce nitrogen deposition and that because the issue goes beyond Utah's state boundaries, this justifies federal government involvement.

Response: We appreciate the commenter's concerns regarding the negative ecosystem impacts of emissions from coal-fired power plants. We agree that nitrogen deposition can have negative impacts on ecosystems, including the Colorado Plateau ecosystem. However, for purposes of this Regional Haze action, we are not authorized to consider these ecosystem impacts. Therefore, while we note the potential for co-benefits to ecosystem health resulting from our action, we have not taken these potential benefits into account in this action.

Comment: [SCCAW, written hearing statement] One commenter noted that during peak season, vehicle exhaust pollution can also be significant factor.

Response: We thank those who attended and participated at our public hearings. Our response to the consideration of vehicle exhaust pollution within this rulemaking is found elsewhere in the document.

Comment: [SCCAW, written hearing statement] A commenter shared discussions he had with rangers at Capitol Reef, who describe efforts to obtain "dark sky status." Rangers noted that people are often unable to see the fringes of the sky as well as the vertical, center portion, due to obscured air. Private citizen, Randy Long, wrote similar comment on hearing registration card. He noted that Capitol Reef is designated as one of only three national dark sky parks.

Response: Our responses regarding "dark sky status" is found elsewhere in this document.

Comment: [SCCAW, written hearing statement] One commenter thinks we should include Page Power plant in evaluation.

Response: In order to adequately respond to this comment, we need additional information as to why the commenter believes the Page Power Plant should be included in evaluation.

Comment: Mass mailer commenters asserted that Utah's Regional Haze plan will not require any pollution cuts (or any pollution controls), including reduction of dangerous nitrogen oxide pollutants from two big Rocky Mountain Power coal plants in central Utah, plants that are closest to our precious National Parks. Commenters urge state officials to reconsider that -- and specifically to require the significant reductions in pollution consistent with industry-standard technology, as has been done for coal plants in Colorado, Arizona, and New Mexico. Commenters assert that Utah's population and National Parks deserve the same strong and fair protection. Commenters note that other coal plants around the West are cutting haze-causing pollution by 80-90%, whereas Utah lags behind, requiring only 30-40% reductions from two of its dirtiest plants.

Response: We acknowledge the commenters for their support of this action. As stated elsewhere in this document, Utah is subject to the same requirements of the Regional Haze Rule as all other states.

Comment: Mass mailer commenters requested EPA to require the best possible reductions in air pollution from Rocky Mountain Power's coal plants, specifically SCR technology. Commenters believe that investing in cleaner energy generation is vital for their families' health and to protect our parks' iconic views and the tourism and recreation dollars they help generate. Commenters also present a correlation that this relates to the state's economic well-being.

Response: We acknowledge the commenters for their support of this action. Our responses to associated health, economic, and tourism-related impacts are elsewhere in this document.

Comment: In order to protect these spectacular national parks, mass mailer commenters urged EPA to reject Utah's regional haze proposal that would do nothing to reduce the 12,989 tons of nitrogen oxide pollution from four units at Hunter and Huntington every year. This pollution threatens the parks, the health of visitors and neighboring communities and the local recreation and tourism businesses that depend on clean parks for their livelihoods.

Response: We appreciate the commenters' concerns regarding the negative health impacts of emissions from the Hunter and Huntington electrical generating units (EGUs). We agree that the same NO_x emissions that cause visibility impairment also contribute to the formation of ground-level ozone, which has been linked with respiratory problems, aggravated asthma, and even permanent lung damage. Therefore, although our action concerns visibility impairment, we note the potential for significant improvements in human health. Although we appreciate the commenter's concern regarding the negative health impacts of emissions from the Hunter and

Huntington electrical generating units (EGUs), for purposes of this action, we are not authorized to consider these impacts in evaluating the State's RH SIP and promulgating our FIP, and we have not done so. Similarly, while the purpose of the action is to reduce regional haze, we agree that reductions in air pollution can have other, ancillary benefits, including supporting local recreation and tourism businesses. Reducing regional haze will help ensure that views in these parks and wilderness areas are preserved, and will continue to support tourism. The visibility at Class I areas must be improved according to our instructions from Congress as codified in the Clean Air Act but we cannot specifically take these types of potential economic benefits into account in our action.

Comment: Mass mailer commenters noted that requiring significant pollution reductions from Hunter and Huntington, as proposed in EPA's federal plan, is the only choice. It provides a real opportunity to clear the air in our national parks. Requiring installation of selective catalytic reduction, the very same pollution control technology that the EPA has required at many comparable coal plants throughout the United States, including Arizona, Colorado, and Wyoming, will cut nitrogen oxide pollution from the four units at Hunter and Huntington by 76%.

Response: We acknowledge the commenters for their support of this action.

Comment: Mass mailer commenters asserted that these eight national parks and the millions of people that visit them each year deserve the right choice.

Response: We acknowledge that these parks are visited by a large number of people.

Comment: [Transcript p. 69] One commenter noted that bringing down pollution levels from the power plants means when there are fires, such uncontrolled sources of pollution will not be as hazardous. (Sarah Fields, transcript p. 50) Another commenter expressed a similar concern that since Utah is downwind from many pollution sources, simply due to air patterns, that Utah should do what it can to eliminate those things that it can control.

Response: We thank those who attended and participated at our public hearings. EPA agrees that forest fires, when they occur, can impact visibility and public health to a great extent. However, Congress directed EPA to develop rules to address on-going emissions from stationary sources subject to BART to remedy the existing impairment of visibility in Class I areas and restore visibility to natural conditions. As we state elsewhere in this document, we cannot consider health impacts in this action.

Comment: [Transcript pp. 55-56, also more detailed written statement addressed to Administrator] One commenter asserted that EPA should go much further than disapproving Utah's SIP. EPA should consider taking away Utah's right to regulate air quality on behalf of the citizens of Utah. Reasons for this are that Utah is the only state the commenter is aware of that allows some of its largest emitters of pollutants to operate without a Title V permit. Sources are not under a Title V permit since it is not available for the public to see it on their web page. The

technology is easy so the State is not doing their job. How can we expect them to do right by regional haze? Second, the same company that operates Huntington and Hunter built a big power plant, the Lakeside Power Plant, near Wasatch Front in Utah Valley (in Vineyard, Utah near Orem and Provo). Instead of replacing those plants with the state-of-the-art new plant, and cleaning the air up both in the Wasatch Front and in the Emery and Carbon counties, Hunter and Huntington still operate threatening the national parks and now Utah Valley has a large polluting power plant right in the middle of a non-attainment area. The State knows this is the largest single emitter of PM2.5 there is and we are in a nonattainment area here. So how can we trust the state of Utah? The commenter noted the high volume of coal supply trucks in Castleton as 200 plus trucks per day and that the pollution from these trucks has not been considered related to Hunter's operations. The commenter noted that people in Salt Lake would not appreciate that type of traffic. The commenter also discussed his concerns about excess emissions during startups and shutdowns at the Lakeside plant and is another reason the lakeside plant should have replaced the Hunter and/or Huntington Plants. The commenter also requested that EPA provide documentation of the Hunter and Huntington CEMs audits by the state of Utah and/or the EPA regarding any operational deviations over the past 5 years. In 2014 the commenter said he visited the Hunter and Huntington plants and though they were operating it did not appear that the Hunter FGD [flue gas desulfurization] control system was operating.

Response: The assertions made by the commenter are outside the scope of this action. We are not assessing Utah's title V permit program, the Lakeside Power Plant, coal supply truck emissions, or alleged deviations at the Hunter and Huntington units.

Comment: Various commenters expressed the opinion that requiring more controls at the power plants was not about closing coal mines and power plants. Rather the issue is cleaning up the process using the best available technology.

Response: We agree with the commenters that the purpose of the Regional Haze Rule is not to close coal mines and power plants. The purpose of the Regional Haze Rule is discussed elsewhere in this document.

Comment: One commenter suggested that the significant expense of increasing emission controls would keep the coal industry there longer. Another commenter expressed a similar thought that without installing the SCR controls, the Hunter and Huntington plants are going to be more susceptible to being shut down in the future "because they would be on a list of the dirty plants." Another commenter thought installing additional controls would reduce industry's liability.

Response: We take no position regarding the commenter's synopsis. The commenters have not explained how their comments are relevant to this action.

Comment: [Transcript pp. 90-93] One commenter noted that the State has been slow to identify the best available practices for haze and NO_x reduction plans since 2003. The fact that one of the state's sister agencies, the Southeast Utah Group of the Utah National Park Service,

which manages both Arches and Canyonlands, finds the state plan lacking and wants to see SCR technology implemented, speaks volumes about the current plan's shortcomings. The commenter hesitates to take visitors to Grand View Point, Green River Overlook or Dead Horse Point as the National Park Service has documented that haze degrades these view sheds more than 80 percent of the time.

Response: We thank those who attended, participated and provided background information at our public hearings. We share the general concern with improving visibility conditions at Class I areas.

Comment: [Transcript p. 103] One commenter stated that any haze, any type of pollution that impedes people from being able to enjoy the parks needs to be controlled.

Response: We thank those who attended and participated at our public hearings. The Regional Haze Rule and associated guidelines provide clear instructions on how visibility impairment is measured and the associated implementation of best available retrofit technology.

Comment: Several commenters asserted that Hunter and Huntington plants are responsible for 40 percent of the dangerous haze-causing nitrogen oxides pollution emitted by the electricity sector.

Response: The commenters did not submit enough information for us to provide an informed response with respect to their claim.

Comment: [Transcript p. 112] One commenter said people have lost trust in government agencies. Even the EPA is perceived as a captured agency. Requiring that the Hunter and Huntington power plants be upgraded and retrofitted with SCR pollution controls would help restore faith in the government.

Response: We thank those who attended and participated at our public hearings. We take no position regarding the commenter's synopsis.

Comment: [Transcript pp. 161-162] One commenter expressed basic support for the FIP and noted that if there exists a technical solution for the pollution problem, such as SCR, it should be used. Or even better yet would be to find an alternative to coal-fired power production. She acknowledged that this was not a unique thought but that she taking the time to speak since for every commenter like her, there are many others who feel the same way but are not able to comment.

Response: We acknowledge the commenter for their support of this action.

Comment: [Transcript p. 162] A commenter stated that one of the reasons she was for the federal plan was that the State was not doing enough. She cited an example that 30 years ago her husband was a Division of Air Quality official who sat on a panel called the integrated vistas for

protection of our national parks and how the State did nothing [with the panel's recommendations].

Response: We thank those who attended and participated at our public hearings. We take no position regarding the commenter's synopsis.

Comment: [Transcript p. 170] One commenter asserted that allowing 5,000 pound of nitrogen oxide to pour out of these plants every hour of every day is frightening and should not be considered an option.

Response: The commenter did not indicate what power plants are included in the 5,000 pounds of nitrogen oxide figure provided by the commenter. Emissions from the Hunter and Huntington power plants are provided in our proposal.

Comment: [Transcript pp. 190-191] One commenter described her experience as a fifth grade teacher and an assignment to her class to write personal letters to Governor Herbert. The subject of the letters was to ask the Governor to persuade MagCorp of America to follow the EPA guidelines for their smokestacks. The students did not receive response letters. The commenter indicated she received a "nasty gram" from the Governor and was later questioned by her superiors about the appropriateness of the assignment, was reprimanded, and made to feel like she was going to lose her job. The commenter shared this experience to inform others of her opinion that the Governor is not interested in clean air and of the need for EPA involvement in the regional haze plan. The commenter supports the proposed FIP.

Response: We thank those who attended and participated at our public hearings. We take no position regarding the commenter's synopsis.

Comment: [Transcript pp. 198-199] Several commenters expressed the opinion that since air pollution, particularly regional haze and mercury emissions are not local problems, but rather regional problems, EPA is appropriately involved.

Response: Our response regarding our authority and involvement in this action is discussed elsewhere in this document.

Comment: [Transcript p. 210] One commenter discussed that she has an old truck that has to pass emissions and has been required to replace the catalytic converter. She has to have regular maintenance and upkeep to do her part. She would hope that EPA would enforce the same requirements on the coal companies.

Response: We thank those who attended and participated at our public hearings and acknowledge the commenter's support for and personal commitment to clean air.

Comment: [Transcript pp. 211-212] One commenter expressed concern that no one at the hearing has power over what Rocky Mountain Power does. Collectively, however, people do have the power through the United States Government, of which EPA is the environmental regulatory body and would urge EPA to implement the FIP to follow the people's collective will.

Response: We agree with the commenter that our public participation process, further described elsewhere in this document, provides an opportunity to give input into regulatory decision-making.

Comment: [Transcript, pp. 212-214] One commenter stated that he rejected both the state and federal EPA plan. His opinion is that EPA has not done enough to stand up for the common people. Making the air quality improvements to Hunter and Huntington will not solve the problem and will eventually lead to higher prices for the production of electricity in the state of Utah. The commenter feels the actual goal is to reverse not reduce the decline of air quality. The commenter suggested that part of the cost to retrofit these plants, 400 to 700 million dollars, could be put towards subsidizing the production of clean energy like solar, wind, geothermal, tidal and nuclear energy. Additionally, part of the funds should go to research and development of clean transportation methods to further improve air quality and reduce climate change affects. Lastly, a portion of this money should be given back to the community for their health concerns and environmental damage that has been caused. This would have to be matched with a reduction of coal plants over the next five years to be replaced entirely with the methods already stated. This would be a win-win situation that would benefit the entire community. We would not have to revisit this issue in several years. The commenter also noted that as taxpayers and Americans, they should decide what is done with their money and land.

Response: We thank those who attended and participated at our public hearings. Clean energy subsidies and research and development are generally not within the scope of the Regional Haze Rule. Our responses regarding health concerns and ecosystems impacts are found elsewhere in this document.

Comment: [Transcript p. 215] One commenter noted that there is a new federal moratorium on coal leases on federal lands, and that the future of the coal industry in Utah is limited to the extent of existing leases on public lands. With this in mind, he supports the FIP and rejects the SIP on the grounds that the SIP disproportionately places burden upon citizens to reduce emissions while allowing industry to increase emissions over the same period.

Response: We thank those who attended, participated and provided background information at our public hearings.

Comment: [Registration card] One commenter stated that the true cost of energy production (60% from burning coal) should be reflected in policy making decisions. Coal burning facilities should be shut down. If that is not possible the very least that should be done is installing better pollution control systems.

Response: We thank those who attended and participated at our public hearings. We take no position with respect to the commenter's synopsis.

Comment: [Registration card] One commenter stated that we need to end reliance on 18th century energy sources. Commenter expressed empathy for those who need to re-tool their job skills to be able to function in a new, clean economy, but said this must happen for the health and good of all.

Response: We thank those who attended, participated and provided background information at our public hearings.

Comment: [Registration card] One commenter asserted that we should be leaders in the world shift toward cleaner energy production that must occur in order to improve health in the short term, and preserve our way of life and our planet's beauty in the long run. Humanity is resilient - if coal jobs are lost, new clean energy jobs will be created. If prices go up, they will drop as we explore new energy opportunities.

Response: We thank those who attended and participated at our public hearings. We take no position with respect to the commenter's synopsis.

Comment: [PacifiCorp and others] Several commenters noted that the Utah plan is not a "do nothing" plan. The projects completed at Hunter, Huntington and Carbon since 2007 were listed with a summary of costs and emissions reductions.

Response: As stated elsewhere in this document, previous State submittals and our associated approvals and disapprovals are detailed in the proposal for this action[599] as well as our 2012 final rule[600] acting on Utah's September 9, 2008 and May 26, 2011 submittals.

Comment: [PacifiCorp] PacifiCorp stated that the regional haze program is not designed to require that all possible controls be installed immediately during the first planning period. Rather, it is a long-term program, and Rocky Mountain Power will be an active participant in all phases of that program.

Response: We agree with the commenter that the regional haze program contains more than one implementation period and appreciate Rocky Mountain Power for their commitment to active participation in all phases of the program. BART requirements are an important portion of the regional haze program and this action is addressing those requirements.

Comment: [Transcript p. 122] One commenter stated their view that what was said at the hearing that did not support the EPA's position would have no impact on the outcome. The commenter expressed their feeling of obligation to speak out against EPA's actions.

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[599] 81 FR 2004 (Jan. 14, 2016).
[600] 77 FR 74355 (Dec. 14, 2012).

Response: We thank those who attended and participated at our public hearings. Opportunity for public participation consistent with the Administrative Procedure Act is described under section 307(h) of the Clean Air Act. In addition, section 307(d) governs this rulemaking, and section 307(d)(5) requires us to allow written and oral presentation of comments. We consider all public comments received regardless of the commenter's position. However, we are bound to evaluate BART requirements based on the CAA, the RHR, and the BART Guidelines; thus some public comments may unfortunately not have a bearing on our decision.

Comment: One commenter asserted that in order for the plants' emissions to reach these parks, they would have to travel contrary to the westerly prevailing winds which is physically not possible. The source of the haze is most likely from outside the state of Utah. According to the EPA's own website, southern California vehicles alone produce over 10 times the amount of the NO_x emissions than the two power plants combined currently produce. The commenter mentioned this is based on 2011 data and was very curious why this is the latest data he could find. Prevailing winds are in a direct line between southern California and Utah's national parks. The commenter provided additional vehicle emission versus power plant emission comparisons. The commenter also provided anecdotal evidence such as general storm trajectories and transport of wildfire smoke from California to Utah to support his assertions.

Response: Congress directed EPA to develop rules to address on-going emissions from stationary sources subject to BART to remedy the existing impairment of visibility in Class I areas and restore visibility to natural conditions. With respect to considering vehicle emissions, EPA disagrees with the assertion that EPA is unfairly targeting stationary sources of emissions and ignoring the significant contribution of motor vehicle emissions. Consistent with title II of the CAA, the EPA Office of Transportation and Air Quality protects public health and air quality by, among other things, regulating air pollution from motor vehicles, engines, and the fuels to operate them.[601] New cars and sport utility vehicles sold today have emission levels of hydrocarbons, NO_x, and carbon monoxide that are 98-99 percent lower than new vehicles sold in the 1960s on a per mile basis.[602] Similarly, standards established for heavy-duty highway and non-road sources require emission rate reductions on the order of 90 percent or more for particulate matter and NO_x. In 2014, EPA finalized new vehicle emission standards and reduced the fuel sulfur content of gasoline to achieve additional reductions in tailpipe and evaporative emissions from passenger cars, light-duty vehicles, medium-duty passenger cars, and some heavy-duty vehicles starting in 2017.[603] Our response to visibility impacts from sources outside of Utah and to comments about wind trajectories are found elsewhere in this document.

Comment: [Transcript pp. 30-33] Several other commenters discussed power plants being in the wrong location considering wind patterns to adversely impact visibility at the parks. Another

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[601] US EPA Transportation and Air Quality Home Page, available at *http://www.epa.gov/otaq/*.
[602] See, e.g., 76 FR 74854, 74900 (Dec. 1, 2011).
[603] See US EPA Office of Transportation and Air Quality, Fact Sheet for Tier 3 Standards, EPA-420-F-14-010 (Mar. 2014), available at *http://www.epa.gov/otaq/documents/tier3/420f14010.pdf*.

commenter noted similar concerns about out-of-state pollution sources discussing the worst haze he had witnessed coming from a cruise ship in Glacier Bay, Alaska where there were obviously no U.S. coal-generating stations that could contribute to the haze and also discussing haze from other sources that are beyond the scope of and control of both the state and EPA regulators such as wildfires.

Response: We thank those who attended and participated at our public hearings. Our response to visibility impacts from sources outside of Utah as well as wildfires are found elsewhere in this document.

Comment: [Transcript, pp. 58-59] Several other commenters expressed the opinion that vehicle emissions are the primary source of haze in Utah and that should be dealt with before requiring more emission controls on power plants. One commenter provided the example of Bingham High School where thousands of students appear to be driving their cars to school every day which is the kind of issue that should be addressed. The commenter expressed the opinion that we do not try as hard to address the automobiles and some of the other pollution sources, because it is much easier to go for a company like PacifiCorp.

Response: We thank those who attended and participated at our public hearings. Our response to the consideration of vehicle exhaust pollution within this rulemaking is found elsewhere in the document.

Comment: [Transcript p. 44] Several commenters referred to a hidden EPA agenda to close down all the coal mines.

Response: We disagree with the commenter's assertion that EPA has a hidden agenda to close down all of the coal mines. Our response describing the purpose of the Regional Haze Rule is provided elsewhere in this document.

Comment: [Transcript p. 53] One commenter thought the main source of haze-causing air pollution is the Salt Lake International Airport. Colorado relocated their airport for the same reason.

Response: Our response regarding the scope of the Regional Haze Rule is found elsewhere in this document.

Comment: One commenter noted having seen nitrogen oxides around the Hunter plant "floating" to the northwest. Since 2007 the air has been clearer due to the plants having installed scrubbers and other controls. Now the commenter noted he only sees steam being generated. Referring to what another commenter has said about haze coming from the Highway 10 corridor, this commenter noted that Monticello in relation to the Hunter plant is located a little bit to the southeast not northeast.

Response: We thank those who attended and participated at our public hearings and acknowledge the background information submitted by the commenter. Our action is based on emissions data, meteorology, and modeling, and takes into account existing controls.

Comment: [Transcript pp. 87-90] One commenter showed a photograph of the Hunter power plant with blue skies and white steam exhausting from the stacks. The photograph was reportedly taken on January 1. The commenter provided the photograph to meteorologists at four news stations asking for an explanation of how blue skies at Hunter could translate into smog in Salt Lake. He did not ask about impacts to the parks because he visits the parks in San Rafael weekly. He received responses from Channel 13 and Channel 4. The two channels responded that there were no connections. The emissions from those power plants do not affect the Salt Lake Valley. The commenter also mentioned researching the State's website and reading an article about Asian pollution and that such pollution was tracked through satellite imagery coming from China across the ocean and in California and Nevada and into Utah. The article said that the pollution is picked up on monitoring in Utah. The pollution is not produced in Utah so how can it be regulated in Utah?

Response: We thank those who attended and participated at our public hearings. While sources outside Utah may contribute to haze in the Class I areas within Utah, that does not preclude the State's or our obligation to evaluate sources within the State according to the five BART factors, or a BART Alternative, and to require additional controls where necessary. Our response to the geographic location that this rulemaking pertains to is found elsewhere in this document.

Comment: [Transcript pp. 107-108] One commenter discussed reading some publications recently where the Sierra Club and the WildEarth Guardians have bragged about shutting down over 200 coal-fired power plants. That is the purpose of what they are doing.

Response: We thank those who attended and participated at our public hearings. We take no position with respect to the commenter's synopsis.

Comment: [Registration card] One commenter said the State should consider moving the refineries in north Salt Lake.

Response: We thank those who attended and participated at our public hearings. Our response to the location that this rulemaking pertains to is found elsewhere in this document.

Comment: [Registration card] One commenter asserted that the State of Utah has a better understanding and control environmental factors surrounding the National Parks. Commenter lives near the Huntington Plant and has seen nothing but clear air from the plant emission. Costly controls are unnecessary at this time, pollutants carried to the National Parks come from Southern California as they are carried by prevailing winds. This issue is another grab of the US power system by EPA and gives California further advantage over the less populous states. Support states' rights, let Utah decide the enforcement of its industry and utilities.

Response: Our responses to the commenter's statements regarding the impact of emissions from outside of Utah and the State's and EPA's authority are responded to elsewhere in this document. We take no position on the remaining statement made the commenter.

Comment: Several commenters thought EPA had already accepted and approved the changes made at PacifiCorp's plants as meeting the regional haze requirements and questioned EPA's motive's in proposing additional changes. [Transcript p. 75] A similar comment was made by Dave Levanger, the Director of Planning for Carbon County, stating his understanding was that PacifiCorp had spent 500 million dollars at five power generating stations in the area and has achieved the goals set for reduction of NO_x, SO_x and PM. [Transcript p. 35]

Response: Previous State submittals and our associated approvals and disapprovals are detailed in the proposal for this action[604] as well as our 2012 final rule[605] acting on Utah's September 9, 2008 and May 26, 2011 submittals.

Comment: Many commenters discussed the effects of climate change from coal-based power generation and the need to switch to less polluting fuels or renewable energy. Commenters also urged the use of the best available technology to minimize the adverse impacts of using fossil fuels, and as a result, favored the proposed federal plan to install SCR controls at Hunter and Huntington.

Response: While we understand and appreciate the commenters' concerns with respect to climate change, consideration of climate change is outside the scope of our action on the regional haze rule. While CO_2, an emission resulting from the generation of coal-based power, is a greenhouse gas (GHG), it is not considered a visibility impairing pollutant. However, EPA implements regulations that address GHGs, such as under the PSD program, in order to protect the public and the environment from the negative impacts of climate change.

Comment: Many commenters described the Utah SIP as a "business as usual" plan and stated they did not want to give a free pass to the Hunter and Huntington power plants.

Response: Utah is subject to the same requirements of the Regional Haze Rule as all other states.

Comment: [written statement] One commenter asserted that in addition to requiring SCR at Hunter and Huntington, that a reasonable limit should be placed on the life expectancy of both plants.

Response: Under the Regional Haze Rule, the remaining useful life of a source is one of the five factors considered when making a Best Available Retrofit Technology (BART) determination to

[604] 81 FR 2004 (Jan. 14, 2016).
[605] 77 FR 74355 (Dec. 14, 2012).

reduce visibility impairing emissions. The decision to retire a power plant is made by owner/operators.

Comment: [written statement] One commenter noted that Utah's five iconic national parks are treasured resources, not just as growing and critical economic drivers, but also for their intrinsic value. These parks are home to wildlife and unique geography that for many define the state. These parks need to be preserved so that generations to come may experience their wild and inspiring beauty.

Response: We thank those who attended and participated at our public hearings. Reducing regional haze will help ensure that views in Utah's five national parks are preserved. We respond to the ancillary economic benefits of reducing regional haze elsewhere in this document.

Comment: One commenter describing herself as a busy mother with two jobs noted that she was worried that the corporation that runs the Hunter and Huntington plants is solely focused on their own bottom line. She thinks there is room for both smart, modern industry and preservation of the land and air in Utah that benefits all.

Response: We thank those who attended and participated at our public hearings. We take no position with respect to the commenter's synopsis.

Comment: [Docket ID -0037] That the Government of Utah is being vastly irresponsible re allowing the production of pollution from Coal processing..... that contributes to regional Haze in the 4 Corners area of Utah..... is clear. That they would also permit Revolution Fuels to build their CTL plant in Wellington because that area is NOT YET polluted, not yet a non-attainment area.....is shocking. Commenter discussed additional concerns regarding Revolution Fuels facility including methane emissions.

The commenter expressed general support for the FIP option in addition to thanking EPA in advance for closing coal-fired plants in the USA and requesting EPA for help in Utah. The commenter focused on the health benefits that would be realized for those who live in Utah by implementing the FIP.

The commenter also noted that they are bringing the Ozone Sterilization and Maceration processing facility to the Wasatch Front which is a "no emissions" facility and that Denver already has one.

Response: We appreciate the commenters' concerns regarding the negative health impacts of emissions from coal-fired electrical generating units (EGUs). As we state elsewhere in this document, health studies are beyond the scope of this action. The commenters' remarks regarding other facilities are also outside the scope of this action.

Comment: [Docket ID -0039, Emery County Public Lands Administrator] Emery County supports the SIP Revision for reasons stated below. Hunter Units 1 and 2, and Huntington Units

1 and 2 (units) are all within Emery County and in close proximity to Castle Dale, Huntington and other towns and therefore the effect of these units on air quality is of utmost importance to residents of the county. Emery County General Plan, 1996, revised 1999 and 2012 states: Emery County's rural lifestyle is one of its greatest assets. Residents enjoy the "small town~ atmosphere, good moral climate, and community spirit. Local residents also feel a deep appreciation for the County's unique landscape, natural setting and amenities, such as clean air, pure water, and uninterrupted views of the desert and mountains. P. 3 And 9.3 Air Quality Emery County enjoys extremely good air quality and seeks to achieve and maintain all state and federal air quality standards while recognizing economic and environmental impacts and working with the federal and state agencies.... P. 14 Pacificorp and its predecessors have been good neighbors and is an extremely important economic asset to Emery County. At every turn, the power plants have responded to new and more demanding air quality standards, implementing innovative measures to maintain acceptable air quality in the immediate and surrounding areas. We are satisfied that Pacificorp generating facilities are in compliance with the Emery County General Plan. We are further satisfied that the proposed SIP Revision will maintain that compliance. Emery County has reviewed information provided by Pacificorp and which will be provided to Utah Division of Air Quality and concludes that the State of Utah should finalize the SIP Revision.

Response: We acknowledge the commenters' remarks and thank them for their commitment to clean air in Emery County. Our action is based on BART requirements intended to address visibility impairment at Class I areas such as National Parks.

Comment: [Docket ID -0044] The fact that the EPA is suggesting the closure of two Utah power plants is beyond laughable.

Response: The commenters did not submit enough information for us to provide an informed response with respect to their claim.

Comment: [Docket ID -0045] Utah needs to have the strongest regulation in the country for air quality due to its geography keeping polluted air enclosed in population centers. No variances, no extended deadlines for implementation...no kicking the can down the road. Clean air benefits everyone. Mining, refining, coal burning only benefits a few.

Response: We acknowledge the commenter's support for clean air. Utah is subject to the same requirements of the Regional Haze Rule as all other states. We take no position on the remainder of the commenter's statements.

Comment: [Docket ID -0046] There are probably a minority of people in the state who feel as I do. Force the coal power generation companies (company) to utilize current scrubber technology, at their expense. Provide tax incentives (short term) to convert to the most efficient and least harmful construction and use of solar power. Utah has one of the western state's largest open desert areas with an ample supply of open sun lit land. Include in this incentive the installation of wind power generation in appropriate areas. Implement a reasonable shut down schedule of coal

generation plants after pollution blocking equipment has been installed. Put "teeth" in this ruling; no delays after the reasonable time period for shut down has been reached, and if not accomplished, the elimination of tax incentives for alternative energy sources and heavy fines for continuance.

As far as fossil fuel energy workers are concerned, a cooperative effort with substantial funding shared by both the state and appropriate Federal Agencies to provide alternative energy training, i.e. installation technicians, field survey, engineering, new business infrastructure management, etc. There are many associated problems with this effort, as many of the people working the mines, fields, etc., live in rural or certainly less populated areas. Schools can be utilized in the evenings to accomplish training.

States such as Utah, providing a great deal of the Nation's fossil fuel, have become too reliant on the industries to provide tax base and employment. This reliance must be broken with solid and sustainable plans to provide alternatives. Science has clearly shown the people in this and other nations that a continued use of fossil fuels will soon render the planet uninhabitable. The trends of pollution's harmful effects are already becoming harmful to people's health as the planet cannot tolerate much more in the atmosphere. We may have already reached the tipping point.

Response: The commenter's suggestions are outside the scope of the Regional Haze Rule. Refer to our related responses elsewhere in this document.

Comment: [Docket ID -0051] Thank you for this opportunity to comment on this matter. I planned to comment in person, however, fossil fuel companies and their employees were there in force and precluded other members of the public an opportunity to participate. At times, they were intimidating and disrespectful. I understand that coal miners and others related to the industry are concerned about their jobs, however, climate change, air quality I walked 3 miles to speak at the hearing.

Response: We thank those who attended and participated at our public hearings. We responded to criticism of our public hearing venue and process elsewhere in this document and in the FRN.

Comment: [Docket ID -0053] In support of FIP one commenter provided the following comments in addition to other general comments similarly provided by many others…

I sacrifice and diligently take measures such as purchasing wind power under the RMP "Blue Sky Plan", not using air conditioning, and keeping my winter thermostat low, using energy efficient insulation and devices, driving an electric car, biking, walking and taking public transportation, contributing to carbon offsets, etc. However, my impact on reducing harmful greenhouse gas emissions and other air pollutants is miniscule compared to massive pollution from coal-fired generating plants. And RMP, the coal industry, and others do not bear the costs to the public for the carbon they emit into the atmosphere, including costs noted above, as well as other. The intermountain power grid is one of the dirtiest in the nation, largely due to inaction

by RMT and its affiliates, and to state and local governments that are excessively pro-industry and growth.

Response: We acknowledge and appreciate the commenter's efforts to reduce the environmental impact of their energy use. We take no position with respect to the commenter's other statements.

Comment: [Docket ID -0055] My name is Francis H Luzzi Jr and I hear the news report and I think that the EPA should make the power plant put more, emissions control devices onto the coal power plant or they should shut it down and make them refit the power plant to burn natural gas witch would put out less emissions than burning coal and would run cleaner be better for the environment and help to clean the air. I also propose that more restrictions should be put into place that also would put a ban on idling the automobiles on the road to two minutes. There should also be a wood stove and fireplace ban instituted during the yellow air quality days instead of waiting for the air quality to sink to orange or red. I would also recommend for the state county and city government official encourage Utah Transit Authority to expand their Natural gas burning buses to also run in Utah county and Webber and Davis counties and to find a way for them to lower the bus fair so it would attract more ridership these are solutions that I think that would help to clean the air in the State of Utah.

Response: We acknowledge the commenter's support for clean air. Under the RHR[606] we cannot, and did not, evaluate the costs associated with switching the Hunter and Huntington units over to natural gas for BART. Although the BART Guidelines provide that we do not consider BART as a requirement to redesign the source when considering available control alternatives[607] we do note that if a State considers it appropriate, it may consider a fuel switch (i.e. switch from burning fuel oil to natural gas), which does not necessarily constitute a redesign of the source, as one of the options in the BART analysis for a particular source. The suggestions made by the commenter with respect to automotive idling, wood burning, and natural gas vehicles fall outside the scope of this action and are generally regulated under other provisions in the Clean Air Act. Recommendations for state, county, and city governments to encourage Utah Transit Authority to expand natural gas buses in Utah, Webber, and Davis counties also fall outside the scope of our authority.

Comment: [Docket ID -0056] Utah coal power plants are wonderful. They provide good paying job that help these communities thrive. Time and time again these power plants have jumped through the EPA hoops. Coal is now a clean effective ways to have power. Let us as a country not retard the progress of technology of our country.

Response: It is not EPA's intention to endanger the economic viability of the communities referenced by the commenter. Neither the CAA nor th e RHR requires states or EPA to consider

[606] 70 FR 39104, 39164 (July 6, 2005)("[N]ote that it is not our intent to direct States to switch fuel forms, e.g. from coal to gas.").
[607] 40 CFR app. Y to Part 51, section IV.D.1.

potential job losses as part of a BART analysis. Rather, they require consideration of "the costs of compliance, the energy and non-air quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology."[608]

The BART Guidelines do allow for (but do not require) the consideration of "significant economic disruption or unemployment" as part of "energy impacts." Specifically, the Guidelines provide that:

> [T]he energy impacts analysis may consider whether a given alternative would result in significant economic disruption or unemployment. For example, where two options are equally cost effective and achieve equivalent or similar emissions reductions, one option may be preferred if the other alternative results in significant disruption or unemployment.[609]

Thus, only where a potential control option is expected to "result in significant economic disruption or unemployment" can we consider employment-related economic effects as part of a BART determination. In this case, no evidence was provided to us that potential control options would result in employment-related economic effects. In the absence of such evidence, assertions regarding job losses are speculative and we cannot consider them as part of our BART determination.

Comment: [Docket ID -0099] I attended the Regional Haze Hearing in Salt Lake City on January 26...The arguments I heard revolved around several points:

1) The air around the Hunter and Huntington coal power plants is generally clear.
I have asthma, and I travel each winter to Moab and Arches to escape the horrendous air in SLC. Invariably in recent years, a yellow haze hangs over the Moab Valley, and in Arches the long views are anything but clear. There are no forest fires in winter (a popular excuse for haze from the speakers who admitted there was some). In addition, NO_x, one of the primary toxins emitted from these plants, is odorless and invisible. The fact that sometimes one doesn't see emissions from these factories means nothing.

2) We are law-abiding citizens and our plants are following the letter of the law.
The State of Utah has gone from non-attainment of EPA air quality standards to serious non-attainment in the past year. Even if these plants are meeting EPA standards, the Department of Air Quality's SIP is unlikely to move the state into attainment by the prescribed time. Why not use the best available technology wherever possible in an attempt to bring the entire state into attainment?

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[608] 42 USC 7491(g)(2); 40 CFR 51.308(e)(1)(ii)(A).
[609] 40 CFR 51, app. Y, section IV.D.4.h.

3) It's cars that are causing the damage. The EPA should go after them.
OK! Admission that there is damage. But the EPA is doing a great job regulating passenger vehicles with its Tier 3 standards. And the miners are forgetting that vehicles used by industry to transport their goods to and from the plants are lumped into the transportation sector, not the industry sector, in polluter charts. That means that a 50-ton oil truck is in the same category as a Prius.

I understand that coal miners feel threatened that their industry, and therefore their jobs, are under attack. But our world is changing. People in print media, CD manufacturers, taxi drivers, and countless others have been forced to make adjustments as technology changes the markets around us. Dirty energy must be replaced by clean energy for our planet to survive. Miners should see the canary in their coal mines, and seek retraining while they have the chance. Only a captain goes down with the ship.

Response: We thank those who attended and participated at our public hearings. Our responses to the commenter's statements are found elsewhere in this document.

Comment: [Docket ID -0070] The EPA cannot keep changing regulations from year to year over people's opinions on how they think the air quality looks. How the air quality in SLC is nowhere near the same as the area's do that these power plants are in. The EPA needs to vote on facts not on opinions by people that don't even live in these areas.

Response: Our response to the location that this rulemaking pertains to is found elsewhere in this document. We have based our action on the requirements of the CAA, RHR, BART Guidelines, emissions and meteorology data, modeling, and assessment of control technology options. We have not based it on opinion surveys.

Comment: [Docket ID -0077] I suggest that you do a further investigation into the factors that are actually responsible for the haze situation in Moab rather than condemning our community without due process.

Response: We disagree with the commenter that the Agency did not provide an adequate opportunity for public comment. Section 307(h) of the CAA instructs EPA to provide "a reasonable period for public participation of at least 30 days" when promulgating a FIP. Here, EPA chose to provide a significantly longer 60-day public comment period in light of the co-proposal for both the State's BART Alternative and EPA's FIP. EPA believes that 60 days was a reasonable amount of time for the public to comment on the co-proposal. EPA also held a public hearing as an additional means to obtain public comments on the co-proposal, as required under section 307(d)(5) of the CAA. Furthermore, the commenter has not identified a relevant and protected property or liberty interest that this action affects; thus there is not support for their general allegation that due process has been violated.

Comment: [Docket ID -0082] Don't we find it ironic that the haze seems worse in the salt lake valley since the natural gas plants were built and producing in your own backyard? After all it is a fossil fuel and although maybe a shade cleaner it still is a polluter.

Response: Our response to the location that this rulemaking pertains to is found elsewhere in this document.

Comment: [Docket ID -0086] Why is it that we have clean air in our area even with the power plants? I don't see Green River, Moab, or even Grand Junction with a pollution problem and they would be directly affected by these power plants. The wind travels from the west to the east as is seen on a regular basis due to the stream that is emitted from the stacks. So therefore your argument that they are causing pollution in "Salt Lake" is null and void. For 1.The mountains act as a natural barrier allowing the wind to sweep any pollution east and therefore those cities I mentioned would see an increase in pollution. 2. If there was any impact of pollution it would be the other way around. As the winds on a regular basis travel from the northwest to the southeast and therefore the Salt Lake County and Utah County would be polluting our county. And you can take that to the bank because of how many inversion days are there in those places? That's right, more than most of these tree huggers can count. And how many are there in Emery County? None that I know of and I've lived here most of my life. Those of you people who think you know what's best for us are sadly mistaken. All you are doing is wasting time and resources to try to prove your agenda. The bad part about it is the people you are supposedly trying to help are the ones you are hurting. Get over yourselves. Our way of life coal mining / natural gas and oil / and power plants are our livelyhood. And we will defend them at all costs.

Response: The Regional Haze Rule protects visibility in the nation's national parks and wilderness areas. Thus, our analyses for this rulemaking did not include the Salt Lake area nor did we make any statements regarding the Salt Lake area air quality in this rulemaking.

Comment: [Docket ID -0088] I'm curious why this is even an issue. There should be mandated regulations of any source of pollution. All automobiles, power plants, factories, etc....Plain and simple.

Response: The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Section 169A of the Clean Air Act (CAA) sets forth a national goal for visibility to prevent any future and remedy any existing impairment of visibility in Class I areas (national parks and wilderness areas) which impairment results from manmade air pollution. In 1999, the U.S. Environmental Protection Agency announced a major effort to improve air quality in national parks and wilderness areas. The Regional Haze Rule calls for state and federal agencies to work together to improve visibility in 156 national parks and wilderness areas such as Canyonlands, Arches and Capitol Reef National Parks.

Comment: [Docket ID -0093] The Obama administration has made no secret about their war on coal. Mr. Obama has stated publicly that while he cannot stop someone from building a new coal

fired power plant, he would see to it that they would become bankrupt. The EPA administrator, Lisa Jackson, likewise has made public statements that disparage coal.

Response: At the time of this rulemaking, the EPA Administrator is Gina McCarthy. We take no position on the remainder of the commenter's synopsis.

Comment: [Docket ID -0096] Dear Ms. and Mr. Environmental "PROTECTION" Agency, For well over 100 years sovereignty in America has been claimed by Mr. and Ms. Corporation and they do as they please to us with little to no repercussions. We The People have little to no means to defend ourselves. The creation of the EPA was an attempt to help protect us real living breathing human beings and our rights but has failed, rendered toothless of late. However, the individuals at the helm of this now toothless organization such as yourselves could still perhaps have some power left. If you're not too concerned about finding a more rewarding career in the private sector after your stint with the EPA, will you please do something to protect us people from the dirty rotten greedy corporations with their bottom line only profit. We all know what the answers are, they are easy and self evident. The problem is in the will of real people. Will you please stand up to these corporate false persons that have stolen OUR God given sovereignty and make them at least filter their toxic poisonous troublesome deadly emissions!

Response: We take no position on the commenter's synopsis.

Comment: [Docket ID -0104] One commenter apparently from the area of Emery or Carbon County suggested an idea of planting more trees or making more parks to help clean the air up north.

Response: We acknowledge the commenter's support for clean air. Our response regarding the scope of this rulemaking is elsewhere in this document.

Comment: [Docket ID -0117] Canyonlands National Park, Capitol Reef National Park, Hovenweep National Monument, Natural Bridges National Monument, and Grand Canyon-Parashant National Monument are listed with the International Dark-Sky Association as Dark Sky Parks. Goblin Valley State Park is being considered as a Dark Sky Park. In order for these parks to have this distinction they must have very low light pollution, and pristine views of clear dark skies at night. All of these parks are within the vicinity of the Hunter and Huntington Power Plants. Several National Parks representatives have said that these power plants are the cause of hazy skies, and ruining the views for people because the skies are not crisp and clear. If that is so then how could these parks receive the distinction as a Dark Sky Park.

Response: The commenter did not provide enough background regarding the specific criteria associated with the International Dark Sky Association and Dark Sky Park designation, and its relation to visibility impairment, to give us basis for a specific response.

Comment: [Docket ID -0127] As a Natural Resources Recreation Planning Management student who will be graduated this summer, my knowledge and expertise of natural resources

allows me to make an educated assessment of this proposal. This proposal is beneficiary and necessary in many ways. First, the health of everyone will be benefitted; your children, friends, family, and the community as a whole. Carbon Dioxide Emissions are well documented and associated with our climate change which could have catastrophic implications for the future. Second, National Parks are essential to preserve for our wellbeing and economy. Human expansion has led to few areas with development yet numerous studies indicate humans are actually the most happy when living in "natural conditions". We need areas where people can get a break from chaotic every day life in cities. Benefits of National Parks include stress relief, opportunities to be physically active, reducing depression, anxiety, and rewiring our brain. Economically, National Parks bring in revenue from tourism and also raise property values of surrounding areas. Third, coal like other fossil fuels is a nonrenewable resource. There is no sense in continuing using a resource that won't be available for the future. Although this proposal is about upgrading to the most up to date technology and doesn't specifically state that employment will be lost for these workers, even if workers are lost there is little reason to suffer the environmental externalities produced by less than 1% of the total job market. Additionally, transitioning into sustainable resources in the future isn't going to happen overnight. We can't go from relying on fossil fuels to tomorrow not using them at all. Little incremental improvements such as this proposal are necessary to prepare for the future. Fourth, concerns over the functionality and effectiveness of this technology are invalid. Rocky Mountain Power and other coal industries involved in this proposal are the only companies who aren't complying with BART. Every other coal company has complied with BART and is providing nearby areas with adequate power. This technology is proven as other coal company's have adopted it and technically companies like Rocky Mountain Power should have adopted this technology years ago by law. This proposal benefits everyone and our planet in general both today and in the future.

Response: We acknowledge the commenter for their support of this action. While we understand the commenters' concerns with respect to climate change, consideration of climate change is outside the scope of our action on the RHR. Carbon dioxide is a greenhouse gas (GHG); EPA implements other regulations that address GHGs in order to protect the public and the environment from the negative impacts of climate change. Similarly, while the purpose of the action is to improve visibility, we agree that reductions in air pollution can have other, ancillary benefits, including supporting local recreation and tourism businesses and personal enjoyment in our nation's parks. We take no position on the commenter's other statements.

Comment: [Docket ID -0143] With the latest declaration from the Governor regarding cessation of any environmental compliance planning, it is obvious that Utah will not comply in any way with federal air quality requirements unless forced to do so.

Response: We take no position with respect to the commenter's synopsis.

Comment: [Docket ID -0151] EPA needs to implement the Federal Implementation Plan for Regional Haze for the State of Utah. Approximately 20 years ago Utah Division of Air Quality held public hearings on Regional haze around the State of Utah, regrading (regarding??) the

integral vistas to protect the national parks; nothing came of it. Regional haze affects more than just economic profits of the coal industry. It is EPA's responsibility to assure the Public Trust Doctrine is implemented.

Response: We acknowledge the commenter's support for this action and take no position regarding their synopsis.

Comment: [Docket ID -0156 and -0176] Seven Colorado businesses submitted the following comments both electronically and in a letter.

Our region is home to some of the nation's most iconic and stunning natural landscapes. Here in Colorado, the Centennial State, we have a proud heritage of wilderness protected for all to enjoy. More than the mountains and valleys and rivers that dot our beautiful landscape, the natural heritage and way of life here in Colorado is a reason that so many call our state home. The national parks and wilderness areas of our great state are essential elements of our strong and growing recreational economy.

Sadly, many of the public lands in Colorado and throughout the Southwest continue to be threatened by industrial pollution that mars our landscapes, sullies our skies, and endangers the health and economies of local communities.

PacifiCorp's Hunter and Huntington coal-fired power plants in Utah are one such significant threat. Today, pollution from the Hunter and Huntington coal-fired power plants are responsible for 40% of Utah's dangerous haze-causing nitrogen oxide pollution from the electricity sector. Indeed, the National Park Service estimates that views at Arches and Canyonlands National Parks in Utah are shrouded in haze 83 percent of the time, and that coal pollution is a major contributor to the problem. The pollution from the two plants contributes to 11 premature deaths and 233 asthma attacks every year, according to the Clean Air Task Force.

Utah is not alone in facing these pollution threats and we know that haze-causing emissions from the Hunter and Huntington plants does not stop at the Utah border.

Emissions from the Hunter and Huntington coal-fired power plants are a regional threat, known to degrade air quality in nine Class 1 areas across the west. The EPA has shown that haze-causing pollution from the Hunter and Huntington coal-fired power plants threatens our public lands here in Colorado, including Mesa Verde and Black Canyon of the Gunnison National Parks and the Flat Tops Wilderness area.

The state of Colorado has already taken action under the Regional Haze Rule of the Clean Air Act to address haze-causing coal pollution. Both Hayden and Craig coal-fired power plants have been required to reduce nitrogen oxide emissions by 80-90%. Colorado, and our neighbors in Utah, deserves the same strong and fair protections on Utah plants to reduce haze-causing emissions that threaten our region's natural heritage, views, and communities.

Fortunately, we have the affordable and effective solutions we need to combat this pollution threat. Across the country, more than 250 coal-fired power plants have installed modern, industry standard pollution controls to reduce haze-causing emissions. While the State of Utah's proposal to address regional haze would do little to reduce the pollution from the two plants, the EPA has also put forward an option that would compel strong limits on haze-causing emissions by requiring pollution controls on the power plants.

We urge you to move forward with the strongest possible safeguards for our parks and communities. By doing so, we can protect the sanctity of our lands and heritage for this generation and those to come.

Response: We acknowledge these commenters for their support of this action. Protection of human health and the environment is EPA's mission and forms the basis for many Agency actions, including establishing the National Ambient Air Quality Standards (NAAQS), and promulgation of regulations such as the New Source Performance Standards (NSPS) and the National Emission Standards for Hazardous Air Pollutants (NESHAP). In addition to Clean Air Act requirements to protect human health, in the 1977 Clean Air Act Amendments, Congress declared as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution[610]. EPA agrees that visibility-impairing pollutants are among the same pollutants that affect human health; however, for purposes of this action, we are not authorized to consider these impacts in evaluating the State's RH SIP and promulgating our FIP, and we have not done so.

Comment: [Docket ID -0175] One hundred one companies from the Colorado business community co-signed a letter including the following comments.

Colorado's public lands and national parks, with their stunning views and pristine environments, are critical to the state's $13.2 billion outdoor-recreation economy. Every year, 65% of Colorado residents participate in outdoor recreation, and tens of thousands of visitors from other states and countries come to visit and enjoy our stunning vistas and landscapes.

Colorado is celebrated for having some of our nation's most iconic national parks and recreational areas. Our state is graced by a diversity of landscapes, from soaring mountain peaks to red-rock canyons. Our outdoor-recreation industry directly supports approximately 125,000 jobs, and brings tourists and visitors from all over the world into our natural landscapes and those of our neighboring states.

Unfortunately, public lands in Colorado and across the Southwest are threatened by dangerous sources of pollution that harm the very environment our growing outdoor-recreation economy depends on. In particular, emissions from Rocky Mountain Power's Hunter and Huntington coal-

[610] See 42 USC 7491.

fired power plants in Utah put Colorado's clean air and critically important outdoor-recreation economy at risk.

That is why Protect Our Winters, the Sierra Club, and the Colorado business community are writing to ask the Environmental Protection Agency to safeguard our air and our lands with strong and fair reductions in coal pollution by requiring modern, industry-standard pollution controls on the Hunter and Huntington coal-fired plants. We join with many of our colleagues in Utah's outdoor-recreation economy in calling for these strong protections for our communities and livelihoods.

Emissions from these two plants are a regional threat, known to degrade air quality in nine Class 1 areas across the West. In addition to Utah's iconic five national parks, the EPA has shown that haze-causing pollution from the Hunter and Huntington plants threatens some of Colorado's finest public lands, including Mesa Verde and Black Canyon of the Gunnison National Parks and the Flat Tops Wilderness.

This level of pollution is unacceptable and must be addressed. Requiring Rocky Mountain Power to install affordable pollution controls on these two plants will reduce dangerous haze-causing emissions and protect the health of Colorado's national parks, communities, and economy. Coloradans and their neighbors in surrounding states deserve the same protections from coal pollution that the rest of America enjoys. It's time for the Environmental Protection Agency to protect clean air and public lands in the West by guaranteeing strong and equal protection from coal pollution. In doing so, EPA can ensure the sanctity of these majestic places and support the outdoor-recreation industry and the local Colorado businesses that rely on these threatened Class 1 areas.

Response: We acknowledge these commenters for their support of this action. While the purpose of the action is to reduce regional haze, we agree that reductions in air pollution can have other, ancillary benefits, including supporting Colorado's outdoor recreation industry. More specifically, EPA also recognizes the role that protecting visibility in national parks and wilderness areas has to tourism throughout both Utah and Colorado. Reducing regional haze will help ensure that views in these parks and wilderness areas are preserved, and will continue to support tourism. Lastly, we acknowledge that today's action may have positive economic impacts, as described by the comments. We agree that our Class I areas and other national parks and wilderness areas are a source of jobs and contribute to the economies of their respective states. We also agree the visibility at Class I areas must be improved according to our instructions from Congress as codified in the Clean Air Act but we cannot specifically take these types of potential economic benefits into account in our action.

Comment: [Docket ID -0159] The Utah Division of Public Utilities (DPU) submits these comments in support of the Environmental Protection Agency's (EPA) proposed approval in full of Utah's State Implementation Plan (SIP) because the plan complies with the Clean Air Act, was developed in close consultation with the EPA, and makes greater visibility improvements than BART would. The state's SIP balances the need to invest in haze controlling technologies

with the costs and benefits of those technologies. The proposed partial approval of the SIP with proposal of a federal plan would be more expensive and less effective. Its inclusion in the EPA's proposed rule suggests the EPA either is not serious about working with states and deferring to the state's policy choices even when the state's plan meets statutory and regulatory goals, or is considering factors outside of the regional haze rule in its consideration of the state's SIP. Indeed, if the Clean Air Act's enshrinement of cooperative federalism is to mean anything, the EPA must approve the SIP.

As a rate regulator for public utilities, the DPU regulates in the public interest. This responsibility involves a weighing of numerous interests and is often discharged in consultation with other state and federal agencies. The DPU is often called upon to work with our state's environmental regulators to evaluate utility actions and investments. This cooperation prevents the rate regulator and the environmental regulator from developing a myopia that leads to bad decisions. Thus, in developing its rules and discharging its responsibilities under the Clean Air Act and state law, Utah's Division of Air Quality and its Air Quality Board become aware of the impacts of their decisions and proposals on utilities and their ratepayers. In this case, with that knowledge and insight, the DAQ consulted closely with EPA region 8 staff to craft approaches responsive to federal and state statutes and rules while evaluating relevant practical considerations. The result is an effective and well-developed SIP: the very product the Clean Air Act's cooperative federalism hoped to achieve and one not achievable through a FIP, whether partial or whole. In fact, given the DAQ's close consultation with EPA Region 8 staff during the SIP's development, the EPA's promise of further consultation toward a revised SIP in the event of partial disapproval feels hollow.

Utah was an early leader in regional haze efforts and continues to effectively combat regional haze, meeting and exceeding emissions standards in the first planning period. As the DAQ noted in comments at the EPA's January 26, 2016 meeting in Salt Lake City, Utah's smoke management plan, mobile NO_x emissions in urban counties, renewable energy development, and other actions have already reduced emissions. Further, the proposed alternative to BART measures will provide significant reductions of greater magnitude than the proposal to require SCR at Huntington and Hunter units, at lower cost. The DPU will leave to the Utah DAQ, PacifiCorp, and others the technical detail of the proposed federal plan's deficiencies. The DPU merely wishes to highlight the state's diligent and good faith process and its adequate results. Indeed, the state's effort and the resulting SIP are more than adequate.

In some respects the state's measures are more adequate than measures alluded to in the EPA's proposed partial approval, which arrives at its conclusions through assumptions and baselines that are inappropriate. In fact, as the DAQ points out, the EPA would not allow such an approach if used by a state because it relies on conditions as they are currently, rather than as they were at the beginning of the planning period, and it proposes controls outside of the current planning period. In other words, the EPA takes Utah's early efforts for granted and expands its own authority to make proposals not available to states. The EPA also ignores its own guidance to Utah in developing the SIP. It does this to propose a federal plan that is less likely to include meaningful collaboration among environmental and economic regulators, to say nothing of the

many other agencies and entities that have participated in the DAQ's SIP process. This does a disservice to Utah and those who participated in its process. It injures the EPA staff's credibility when assisting in future development of state plans. It violates the spirit, if not the letter, of the Clean Air Act's promise of cooperative federalism and ends-based regulation.

Utah's SIP satisfies the Clean Air Act's requirement that a state submit a plan that mandates the "degree of emission limitation achievable through the application of the best system of emission reduction." 42 U.S.C. §7411(a)(1). Utah developed this plan using the state-centric process contemplated by the Clean Air, in close consultation with EPA staff and others. The plan should be approved because it satisfies the Clean Air Act's requirements. The proposed partial approval should be rejected because the EPA cannot and should not substitute its judgment for the state's when the state's plan is adequate. In this case, approval of a federal plan such as that contemplated in the published notice would undermine the Clean Air Act's process while being less effective and more costly. It would devalue the input of state agencies, residents, and other interests who participated in the DAQ's plan development processes. In short, approving the state's SIP is legal, wise, and required, while partially disapproving the plan is of questionable legality, unwise, more expensive for ratepayers, and will not result in measurable improvement of visibility.

Response: We acknowledge the background information submitted by the commenter. We believe we have been consistent in our review and analysis of the Utah SIP BART Alternative and our partial disapproval and promulgation of a FIP. As explained in more detail elsewhere in this document, we must first review the SIP under the requirements of the CAA and federal regulations. Congress crafted the CAA to provide for states to take the lead in developing implementation plans, but balanced that decision by requiring us to review the plans to determine whether a SIP meets the requirements of the CAA. We have the authority to disapprove a SIP if it does not meet minimum CAA and/or regulatory requirements. This rulemaking is consistent with the statute. Further, each Regional Haze SIP requires that we review it on an individual, case by case basis, based on the specific facts presented. Regional haze problems can fundamentally differ from state to state and region to region and thus require a case by case review. The Regional Haze Program is one of our more complicated programs, by virtue of our desire to extend flexibility to our states. The Regional Haze Rule was designed to offer states multiple pathways to achieving the national goal of a return to natural visibility. States have flexibility in meeting our regulations, but our role as reviewer remains – we must review state regional haze plans to determine whether they meet the requirements of the CAA. Regardless of the inherent flexibility in the regional haze program, if we determine that a state's SIP is not approvable, we must replace it with a federal plan. And in devising that federal plan, we too are afforded some flexibility, as long as our federal plan complies with the CAA and our regulations. There was not enough information provided about Utah's exceedance of "emissions standards" for us to effectively respond. Our determination of the state's adequacy as well as public participation process followed with our own FIP approach, is provided elsewhere in this document.

Comment: [UCARE, p. 1] UCARE recognizes that a focus on "haze" in national parks is in fact a focus on air quality degradation caused by human-generated pollutants. When we read in the newspaper, or hear on the radio, a weather report that calls for "hazy conditions", we know pollution levels have risen high enough to degrade visibility. The term "haze" sounds less threatening than "smog"; but most adults know that "haze" means the air is polluted with chemical and particulate contaminants that threaten human health. Any SIP preference for shaping the regional haze problem as one of "visibility" masks the very real threats to public health and welfare that haze entails and lessens the likelihood that the best solutions will be discussed, let alone be implemented.

Response: According to the Regional Haze Rule, "regional haze" is defined as visibility impairment that is caused by the emission of air pollutants from numerous sources located over a wide geographic area. Such sources include, but are not limited to, major and minor stationary sources, mobile sources, and area sources. The scope of the Regional Haze Rule with respect to human health impacts is discussed elsewhere in this document.

Comment: [UCARE, p. 1] We also recognize that the air pollution contributing to visibility degradation and unhealthful conditions in national parks originates at point sources upwind of the parks and proceeds to flow downwind from the parks. The 2010 Synapse Energy Economics report for Utah (cited below) found that most of the premature deaths caused by Utah electricity generating units (EGUs), including Hunter and Huntington, occur in populations downwind of Utah. Might the federal government be liable for "downwinder" deaths occurring because unhealthful air was not stopped from flowing through the parks?

Response: The Regional Haze Rule calls for state and federal agencies to work together to improve visibility in 156 national parks and wilderness areas. In so doing, although we do note the ancillary public health benefits resulting from controlling the same pollutants that cause visibility, we cannot and have not considered those health benefits, including the prevention of premature deaths, in arriving at our decision.

Comment: [UCARE, pp. 1-2] UCARE is concerned that in Utah's SIP document, health care and other economic costs associated with haze generating sources are not quantified or otherwise addressed. We feel that the societal costs of EGUs generally, and the four identified BART coal-fired power facilities specifically, should have be identified and factored into the determination of reasonable costs for further reducing levels of sulfur dioxide, and other harmful pollutants. The true costs of coal extraction, combustion, and disposal should be incorporated into energy policies and programs. It is UCARE's position that utilities owning EGUs should be held financially responsible for the pollution-related costs with which they burden society. Real-world costs of haze should not be externalized from EGU account ledgers, corporate balance sheets, and regulatory proceedings to the ratepayers.

Response: First, we appreciate the commenters' concerns regarding the negative health impacts of emissions from electrical generating units (EGUs). To the extent that this action reduces these emissions, there are co-benefits for public health; however, we are not authorized to consider

these impacts in evaluating the State's RH SIP and promulgating our FIP, and we have not done so. Second, the incorporation of the true costs of coal extraction, combustion and disposal into energy policies and programs is outside the scope of this rulemaking. Finally, EPA does not have authority to dictate how pollution-related costs are or are not externalized.

Comment: [UCARE, p. 2] We also feel that the broader, long-term energy context of which the Hunter and Huntington facilities are a part should be brought into the FIP assessment of the impacts their toxic effluents could produce. Specifically, PacifiCorp intentions for the continued use of these four coal-fired plants, contained in its 2015 Integrated Resource Plan (IRP) should be included as one of the factors shaping societal costs. The EPA's FIP for Utah should direct the state to require PacifiCorp, and its Rocky Mountain Power subsidiary, to include data on the health care, economic, and other societal impacts of energy production scenarios that include those involving conversion of the four BART facilities to natural gas and the replacement of the BART facilities' base load by renewable energy sources coupled with utility-scale energy storage.

Response: We appreciate the commenter's concerns regarding health care, economic, and other societal impacts of energy production scenarios; however, for purposes of this Regional Haze action, we are not authorized to consider these impacts. The Regional Haze Rule, and specifically the BART Guidelines, specify the five factors States, and EPA in the case of a FIP, must consider in making BART determinations: (1) Cost of compliance, (2) the energy and non-air quality environmental impacts of compliance, (3) any existing pollution control technology in use at the source, (4) remaining useful life of source, and (5) degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. While the cited information in the Integrated Resource Plan might be relevant to a BART alternative, for example if the State were to put forth a revised plan, in this action we are promulgating a BART FIP.

Comment: No data or improvements in measurable haze has been provided to the public from the Carbon Plant Shutdown to drive additional restrictions.

Response: The State's BART Alternative provided data and associated improvements in measurable haze associated with the shutdown of the Carbon Plant.

Comment: Referring to Section 169A(g)(2) of the Clean Air Act, the State is supposed to make 'reasonable progress towards the natural visibility goal'. They have done this through six (6) updates to the plan from 2003 through 2015.

Response: The statutory requirement is for EPA to require that a State's SIP "contain[s] such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal" of preventing any future and remedying any existing visibility impairment in mandatory class I areas. 42 U.S.C. § 7479(a)(1), (b)(2). It is thus not sufficient that a State make SIP submissions; EPA must ensure that the elements contained within those submissions, together with measures already existing in a State's SIP, are

sufficient to achieve reasonable progress. As explained in the notice of final rulemaking for this action and elsewhere in this document, EPA determined that the measures in Utah's June 4, 2015 regional haze SIP submission are not sufficient to allow the State to achieve reasonable progress.

Comment: Citing subsection (3) of Section 169 of the CAA, which considers the 'existing pollution control technology in use'. The State has demonstrated quantitatively through monitoring data improvements in Sulfur Dioxide (SO_2), NO_x, and PM_{10}. The State data has also demonstrated the cost of the SCR technology would provide only marginal improvements.

Response: We respond to the commenter's assertions elsewhere in this document.

Comment: [Carbon County, p. 2] We also have concerns about EPA's interpretation of the data and its penchant to link PM from the Hunter and Huntington Power Plants as a major contributor to regional haze in National Parks. National Park data collected from 2010 to 2014 by monitoring PM has shown that during the 20% worst visibility days, only 10% of the light extinction was attributed to NO_x in Capitol Reef, 8% in Bryce Canyon, 6% in Mesa Verde, 5% in Grand Canyon and 4% in Zion. This data doesn't separate the PM emissions from vehicles traveling on the main roads that are much closer to any of the national parks than either the Hunter or the Huntington power plants. No data has determined amounts or time intervals that air currents could possibly carry PM from these power facilities to any National Parks understanding that air currents very seldom move in a direction to allow PM from the plants to travel to any National Parks. What is the dilution when this happens given the distance? Given the fact that, at any given time, 90% to 95% of the PM monitored in the National Parks is attributable to other aerosols determined through science as naturally occurring from wildfire, dust, plants and animals, how can an economic impact of $40,000,000 in the Carbon/Emery county area with a ripple effect of close to $150,000,000 statewide be ignored for an almost undiscernible amount of light extinction a few days a year maybe?

Response: First, EPA agrees that forest fires, when they occur, can impact visibility to a greater extent than anthropogenic sources of emissions. However, in this action Congress directed EPA to address on-going emissions from stationary sources subject to BART to remedy the existing impairment of visibility in Class I areas. Second, our response to the consideration of vehicle exhaust pollution within this rulemaking is found elsewhere in the document. Finally, the commenter did not provide enough information on the costs referenced in their comment for us to adequately respond.

Comment: [PacifiCorp, p. 65] Some parties have expressed the view, because PacifiCorp considered certain planning scenarios in PacifiCorp's 2015 Integrated Resource Plan ("PacifiCorp IRP") that include the installation of SCR at one or more of the Units, that Utah also should require SCR at the Units under the Utah SIP Revision. By its nature, however, the PacifiCorp IRP is a general planning document that is intended to assess a variety of potential future generation resource portfolio scenarios across PacifiCorp's generating system. It does not represent a commitment to install SCR at the Units, nor does it indicate that SCR represents BART at the Units. In addition, although the PacifiCorp IRP includes remaining life and cost

assumptions for the Units in regard to SCR installation across the planning scenarios assessed, those assumptions do not directly relate to the SIP Revision.

Response: We agree that the IRP does not represent the type of federally enforceable requirement (either for installation of SCR or for a revised remaining useful life) that could change or affect our action today. We have generally carried out our cost estimates in accordance with the BART Guidelines and CCM, accepting certain specific costs when they are documented and reasonably analyzed. The comments referencing the IRP do not indicate that it contains the sort of information that would cause us to revise our cost estimates.

To: Gunasekara, Mandy[Gunasekara.Mandy@epa.gov]
From: Spencer, Stuart
Sent: Wed 10/11/2017 9:34:38 PM
Subject: Draft Regional Haze SIP and Entergy White Bluff Administrative Orders
6_RH SIP_Intro_Clean_10_10_17 CLEAN SS.docx
ATT00001.htm
6_RH SIP_Intro_Clean_10_10_17 redline SS.docx
ATT00002.htm

Mandy,

I hope all is well! We've been having computer issues here at ADEQ for the last two days, but I wanted to go ahead and get the attached docs to you. I'll call you tomorrow to follow up and further explain.

Thanks!

Stuart

Sent from my iPad

Begin forwarded message:

From: "Treece, Tricia" <treecep@adeq.state.ar.us>
To: "Spencer, Stuart" <SPENCER@adeq.state.ar.us>
Subject: FW: Revisions to SIP and AO

Here are the most recent copies of the SIP docs and the language suggestions I sent in the other email are below. I didn't add them to the Word docs since I don't have Microsoft Office on my personal computer.

In the August 18, 2017 updated BART analysis for White Bluff, Entergy amortized costs based on their proposal regarding (changes in) coal-fired operations. The August 18, 2017 analysis redacted Entergy's proposed date (to enact these changes); however, the cost-effectiveness for Dry FGD included in the August 18, 2017 analysis corresponds to Dry FGD cost-effectiveness estimates provided in Entergy's April 21, 2017 letter based on a seven-year to eight-year remaining useful life scenario. In comments on the AR RH FIP, Entergy also proposed dates as part of a "multi-unit plan to improve visibility and to better manage generation assets for reliability and costs." In those comments, Entergy proposed to "take an enforceable limit" regarding their (planned changes in) coal-fired operations.

Under the guidelines for BART determinations, the remaining useful life calculation should begin on "the date that controls will be put in place" (compliance date) and ending on "the

date the facility permanently stops operations." Based on the controls evaluated, the compliance date for controls would be as expeditiously as practicable, but in no event later than five years after approval of the SIP. The guidelines further specify that the permanent operations cessation date should be "assured by a federally- or State-enforceable restriction preventing further operation." Therefore, ADEQ agrees that Entergy's cost-effectiveness calculations are reasonable based on a remaining useful life of seven years and Entergy's proposal to take an enforceable limit regarding (the timing of their planned changes in) coal-fired operations.

From: Spencer, Stuart
Sent: Tuesday, October 10, 2017 11:11 AM
To: Montgomery, William; Treece, Tricia
Subject: Revisions to SIP and AO

I revised remaining useful life language.

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APPENDIX F Administrative Order with Entergy Arkansas, Inc.

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I. Introduction

Arkansas' Class I areas, the Caney Creek Wilderness Area and the Upper Buffalo Wilderness Area, have seen marked improvement in visibility since the start of regional haze monitoring. Based on the Interagency Monitoring of Protected Visual Environment (IMPROVE) data, which reflects monitored visibility impairment in Class I areas, the haze index for the twenty percent worst days of visibility has been steadily improving as a result of reduced emissions within Arkansas and because of broader industrial and energy trends in other states. According to modeling performed by the Central Regional Air Planning Association (CENRAP)[1], all of Arkansas' elevated point sources (including all power plants and large industrial sources) account for only about 2.7% and 2.3% of total light extinction within Caney Creek and Upper Buffalo, respectively. The overwhelming visibility impact comes from non-Arkansas point sources and mobile sources. Because of the Mercury and Air Toxic Standards (MATS) rule[2], the continuing benefits of the Clean Air Interstate Rule (CAIR), the next phase of the Cross State Air Pollution Rule (CSAPR), and the National Ambient Air Quality Standards (NAAQS), along with continuing reductions in emissions from mobile sources, the visibility at Caney Creek and Upper Buffalo will continue to improve. Based on the visibility trends in both Class I areas, the imposition of the State Implementation Plan (SIP) controls, no further action will be necessary to ensure that Arkansas' Class I areas remain below the Uniform Rate of Progress (URP) until at least 2028 and likely even longer as a result of emissions controls that will be required by future regulatory programs and planned retirements of numerous electric generating units.

A. Arkansas State Implementation Plan Revision

Arkansas has made significant improvements in air quality in recent years. Arkansas is now in attainment for all of the national ambient air quality standards and is well below both the state and the EPA's 2018 regional haze reasonable progress goals. Arkansas is taking steps to revise its regional haze state implementation plan (SIP) to return control of the regional haze program to the state.

Specifically, Arkansas has included in this state implementation plan (SIP) revisions to

[1] CENRAP is a regional planning organization that includes nine states–Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Missouri, Arkansas, and Louisiana. Five such regional organizations are funded by EPA to address the interstate transport nature of the regional haze pollutants. The primary objective of these organizations is to evaluate technical information to better understand the impact of the affiliated states on national strategy and to develop regional strategies to reduce emissions of particulate matter and other pollutants leading to regional haze.

[2] In spite of the Supreme Court decision in Michigan v. EPA, 135 S.Ct. 2699 (2015), which held that EPA must evaluate costs in determining whether it is appropriate and necessary to regulate hazardous air pollutant emissions from electric generating units (EGUs), several EGUs already have installed controls to comply with MATS or have undertaken other steps to reduce their emissions. Even if the rule is stayed or vacated while EPA undertakes its cost analysis, ADEQ expects that the rule will go forward before the end of this planning period along with the associated emission reductions.

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address disapproved portions of the Arkansas Regional Haze State Implementation Plan (AR RH SIP), submitted to the United States Environmental Protection Agency (EPA) in 2008. In 2012, EPA partially approved and partially disapproved the 2008 AR RH SIP.[3] Specifically, the following elements are being submitted for EPA approval:

- BART compliance dates;
- Best available retrofit technology (BART) eligible sources and subject-to-BART Sources;
- BART determinations:
  - Sulfur dioxide (SO_2), nitrogen oxides (NOx), and particulate matter (PM) BART determinations for Arkansas Electric Cooperative Corporation (AECC) Bailey Plant Unit 1;
  - SO_2, NOx, and PM BART determinations for AECC McClellan Plant Unit 1;
  - SO_2 and NOx BART determinations for Southwest Power Company (SWEPCO) Flint Creek Plant Boiler No. 1;
  - SO_2, NOx, and PM BART determinations for the fuel oil firing scenario and NOx BART determination for the natural gas firing scenario at Entergy Arkansas, Inc. (Entergy) Lake Catherine Plant Unit 4;
  - SO_2 and NOx BART determinations under both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Units 1 and 2;
  - BART determination for Entergy White Bluff Plant Auxiliary Boiler;
  - SO_2 and NOx BART determinations for Domtar Ashdown Mill Power Boiler No. 1; and
  - SO_2, NOx, and PM BART determinations for Domtar Ashdown Mill Power Boiler No. 2;
- Reasonable progress goals (RPGs); and
- Long-term strategy.

The remaining provisions of the 2008 AR RH SIP were approved. Arkansas is not revising portions of the 2008 AR RH SIP that were approved.

B. Arkansas SIP Components Included in this Revision

The following Administrative Orders (AOs) are included in this SIP revision:

- LIS No. xx between Entergy and ADEQ
- LIS No. xx between SWEPCO and ADEQ
- LIS No. xx between AECC and ADEQ

[3] *Approval and Promulgation of Implementation Plans; Regional Haze State Implementation Plan; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze.* (77 FR 14604, March 12, 2012)

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- LIS No. xx between Domtar Ashdown Mill and ADEQ

Inclusion of permanently enforceable emissions limitations and compliance schedules in the included AOs is consistent with and allowable under federal programs.

Sampling, monitoring, and reporting requirements that are generally applicable to stationary sources, including sources for which emissions limitations are established in this SIP, are contained in SIP-approved Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation No. 19 Chapter 7. No revisions to requirements in Regulation No. 19 Chapter 7 were necessary for this SIP revision.

The Arkansas Department of Environmental Quality (ADEQ) asks that EPA withdraw SIP-approved provisions of APC&EC Regulation No. 19 Chapter 15 from the SIP. No changes are needed to EPA's determinations with respect to previously approved BART limitations contained in Regulation No. 19 because these limitations have been included in the respective AOs.

II. Background

In 1977, Congress added § 169 to the Clean Air Act (CAA), which set forth the following goal for restoring pristine conditions in national parks and wilderness areas:

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> Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from man-made air pollution.

In 1980, EPA issued regulations to address visibility degredationthat is "reasonably attributable" to a single source or small group of sources. These regulations primarily addressed "plume blight"—visual impairment of air quality that manifests itself as a coherent plume—rather than overall haze. In 1988, EPA, the states, and federal land managers (FLMs) began monitoring fine particulate matter concentrations and visibility in thirty Class I areas to better understand the species of particulates causing visibility impairment.

When the CAA was amended in 1990, Congress added § 169(B) which authorized research and regular assessments of progress toward restoring visibility in Class I areas and authorized the creation of visibility transport regions and commissions. Specifically, CAA § 169(B)(f) mandated the creation of the Grand Canyon Visibility Transport Commission (GCVTC) to make recommendations to EPA for regions affecting the visibility of the Grand Canyon National Park. EPA relied upon the recommendations of

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GCVTC and research reports to develop the 1999 "Regional Haze Regulations: Final Rule" (RHR).[4]

The 1999 RHR sought to address the combined visibility effects of various pollution sources over a wide geographic region with the goal of achieving natural visibility conditions at designated Class I areas by 2064. This required all states, including those that did not have Class I areas to participate in planning, analysis, and emission control programs under the RHR. States with Class I areas were required to conduct certain analyses to establish goals for each Class I area in the state to 1) improve visibility on the haziest days and 2) ensure no degradation occurs on the clearest days. These goals and long-term strategies to achieve these goals were to be included in SIPs covering each ten-year period leading up to 2064. States were also required to submit progress reports in the form of SIP revisions every five years. The 1999 RHR also expanded the existing Class I visibility monitoring network to 108 Class I areas.

For the purposes of assisting with coordination and cooperation among states to address visibility issues, EPA designated five regional planning organizations (RPOs) to assist with coordination and cooperation among states in addressing visibility issues the states have in common. Arkansas was located in the CENRAP RPO. Figure 1 is a map depicting the five RPO regions designated by EPA.

Figure 1 Regional Planning Organizations

In SIPs covering the first ten-year period, states were also specifically required to evaluate controls for certain sources that were not in operation prior to 1962, were in existence in 1977, and had the potential to emit 250 tons per year or more of any air pollutant. These sources were referred to as "BART-eligible sources." States were

[4] 64 FR 35714

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required to make BART determinations for all BART-eligible sources or consider exempting some sources from BART requirements because they did not cause or contribute to visibility impairment in a Class I area. BART-eligible sources that were determined to cause or contribute to visibility impairment in a Class I area were subject to BART controls. In determining BART emissions limitations for each subject-to-BART source, States were required to take into account the existing control technology in place at the source, the cost of compliance, energy and nonair environmental impacts of compliance, remaining useful life of the source, and the degree of visibility improvement that was reasonably anticipated from use of each technology considered. States also had the flexibility to choose an alternative to BART, such as an emissions trading program, that would achieve greater reasonable progress in visibility protection than implementation of source-by-source BART controls. SIPs for the first ten-year planning period were due on December 17, 2007.

In 2005, EPA issued a revised BART rule pursuant to a partial remand of the 1999 RHR by the U.S. Court of Appeals of the DC District Court in 2002.[5] The Court had remanded the BART provisions of the 1999 RHR to EPA and denied industry's challenge to the RHR goals of natural visibility and no degradation. The revised BART rule included guidelines for states to use in determining which facilities must install controls and the type of controls the facilities must use.

In addition to revisions to BART, EPA has also issued rulemakings establishing the CAIR and its successor the CSAPR as approvable alternatives to source-by-source BART controls.[6] EPA has also amended regulatory requirements for state regional haze plans for the second planning period and beyond.[7]

On September 9, 2008, Arkansas submitted a SIP for the 2008–2018 planning period to comply with regional haze regulations promulgated as of 2005 codified at 40 C.F.R. Part 51. In a 2012 action on the 2008 AR RH SIP, EPA partially approved and partially disapproved the SIP.[8] This partial approval/partial disapproval of the 2008 AR RH SIP triggered a requirement for EPA to either approve a SIP revision by Arkansas or promulgate a federal implementation plan (FIP) within twenty-four months of the final rule partially approving and partially disapproving the 2008 AR RH SIP.

In the 2012 partial approval/partial disapproval of the 2008 AR RH SIP, EPA approved the following elements of the 2008 AR RH SIP:

---

[5] *American Corn Growers Assn. v. EPA*, 291 F.3d.1 (D.C. Cir. 2002)

[6] *Regional Haze Regulations; Revisions to Provisions Governing Alternative to Source-Specific Best Available Retrofit Technology (BART) Determinations* (71, FR 60612, October 13, 2006)
Regional Haze Regulations; Revisions to Provisions Governing Alternative to Source-Specific Best Available Retrofit Technology (BART) Determinations, Limited SIP Disapprovals, and Federal Implementation Plans (77 FR 33642, June 7, 2012).

[7] *Protection of Visibility: Amendments to Requirements for State Plans* (82 FR 3078, January 10, 2017)

[8] *Approval and Promulgation of Implementation Plans; Regional Haze State Implementation Plan; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze.* (77 FR 14604, March 12, 2012)

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- Identification of Class I areas affected by sources in Arkansas;
- Determination of baseline and natural visibility conditions;
- Determination of a uniform rate of progress (URP);
- Select BART determinations:
  - PM determination on SWEPCO Flint Creek Plant Boiler No. 1;
  - SO_2 and PM determinations for the natural gas firing scenario for Entergy Lake Catherine Plant Unit 4;
  - PM determinations for both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Plant Units 1 and 2; and
  - PM determination for Domtar Ashdown Mill Power Boiler No. 1;
- Consultation with FLMs and other states regarding RPGs and long-term strategy;
- Coordination of regional haze and reasonably attributable visibility impairment (RAVI);
- Regional haze monitoring strategy and other SIP requirements under 40 C.F.R. 51.308(d)(4);
- A commitment to submit periodic regional haze SIP revisions; and
- A commitment to submit periodic progress reports that include a description of progress toward RPG and a determination of adequacy of the existing SIP.

EPA disapproved the following elements of the 2008 AR RH SIP:

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- BART compliance dates;
- BART-eligible sources and subject-to-BART sources;
- Select BART determinations:
  - SO_2, NOx, and PM BART determinations for AECC Bailey Plant Unit 1;
  - SO_2, NOx, and PM BART determinations for AECC McClellan Plant Unit 1;
  - SO_2 and NOx BART determinations for SWEPCO Flint Creek Plant Boiler No. 1;
  - SO_2, NOx, and PM BART determinations for the fuel oil firing scenario and NOx BART determination for the natural gas firing scenario at Entergy Lake Catherine Plant Unit 4;
  - SO_2 and NOx BART determinations under both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Units 1 and 2;
  - BART determination for Entergy White Bluff Plant Auxiliary Boiler;
  - SO_2 and NOx BART determinations for Domtar Ashdown Mill Power Boiler No. 1; and
  - SO_2, NOx, and PM BART determinations for Domtar Ashdown Mill Power Boiler No. 2;
- RPGs; and
- Long-term strategy.

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On September 27, 2016, EPA finalized a regional haze FIP for Arkansas (AR RH FIP).[9] This FIP established new BART requirements for those sources whose BART determinations in the 2008 AR RH FIP were disapproved. The FIP also required the installation of controls at Entergy Independence Units 1 and 2. Despite the previous disapproval of ADEQ's determination in the 2008 AR RH SIP that Georgia Pacific Crossett Mill Boiler 6A and 9A did not cause or contribute to visibility impairment in a Class I area, EPA reversed its decision and concurred with ADEQ that Georgia Pacific Crossett Mill Boiler 6A and 9A are not subject to BART.

On November 22, 2016, the State of Arkansas filed a Petition for Reconsideration and Administrative Stay of the AR RH FIP. In the petition, the State of Arkansas requested that EPA reconsider the AR RH FIP based on new information not raised during the comment period that was of central relevance to the outcome of the FIP. Arkansas asserted that EPA should reconsider controls on Entergy Independence in light of recent data from the IMPROVE monitoring network that shows that Arkansas has already achieved the amount of progress required for the 2008–2018 planning period without having implemented the controls required in the FIP. Arkansas requested that EPA reconsider NOx emissions limitations placed on BART-eligible facilities in light of the recent rulemaking that increased the stringency of the CSAPR. Arkansas also requested reconsideration of the use of low-sulfur coal as BART for SO_2 at Entergy White Bluff during the 2008–2018 planning period. Lastly, Arkansas requested an immediate administrative stay pending completion of EPA's reconsideration of the AR RH FIP.

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On February 3, 2017, the State of Arkansas filed a Petition for Review of the AR RH FIP with the United States Court of Appeals for the Eighth Circuit. On March 8, 2017, the Court held the case in abeyance for ninety days. On April 14, 2017, EPA issued a letter notifying Arkansas that the Agency was convening the reconsideration process for the following:

- Compliance dates for NOx emissions limitations for Flint Creek Unit 1, White Bluff Units 1 and 2, and Independence Units 1 and 2;
- Low-load NOx limitations applicable to White Bluff Units 1 and 2 and Independence Units 1 and 2 during periods of operation at less than fifty percent of the unit's maximum heat input rating;
- SO_2 emissions limitations for White Bluff Units 1 and 2; and
- Compliance dates for SO_2 emissions limitations for Independence Units 1 and 2.

On April 25, 2017, EPA published in the Federal Register a partial stay of the

[9] *Promulgation of Air Quality Implementation Plans; State of Arkansas; Regional Haze and Interstate Visibility Transport Federal Implementation Plan; Final Rule* (81 FR 66332, September 27, 2016)

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effectiveness of the AR RH FIP (82 FR 18994). Specifically, EPA stayed from April 25, 2017 until July 24, 2017 (ninety days) the compliance dates for the NOx emissions limitations at AECC Flint Creek Unit 1, White Bluff Units 1 and 2, and Independence Units 1 and 2, as well as the compliance dates for the SO_2 emissions limitations for White Bluff units 1 and 2 and Independence Units 1 and 2. This action did not alter or extend the ultimate compliance dates for these units nor did it stay requirements for other units subject to the FIP.

On July 8, 2017, ADEQ proposed revisions to the State's Regional Haze SIP specifically to address NOx from electric generating units (NOx Regional Haze SIP). The NOx Regional Haze SIP revision sought to replace source-specific NOx BART determinations included in the 2008 AR RH SIP, as well as the NOx limitations promulgated under the AR RH FIP, with reliance on the CSAPR trading program. The NOx Regional Haze SIP revision proposal demonstrates that Arkansas meets all of the current requirements under 40 C.F.R. § 51.308(e)(4) for an alternative to NOx BART. ADEQ submitted the proposed NOx Regional Haze SIP to EPA Region 6 on July 12, 2017 and requested parallel processing. EPA proposed approval of the NOx Regional Haze SIP on September 11, 2017.[10]

On July 13, 2017, EPA proposed revisions to the AR RH FIP that would extend the compliance dates for the NOx emissions limitations at AECC Flint Creek Unit 1, White Bluff Units 1 and 2, and Independence Units 1 and 2.[11] In the proposal, EPA stated that the Petition for Reconsideration submitted by the State of Arkansas on November 22, 2016, as well as the petitions submitted by the owners of the five units, raised certain arguments regarding the feasibility of eighteen-month NOx compliance dates for the five units that have merit and warrant proposal of a revision to the AR RH FIP with respect to those compliance dates. Therefore, EPA proposed extension of the NOx compliance dates by twenty-one months.

On July 31, 2017, the Eighth Circuit Court of Appeals granted a motion by the parties to hold the case in which the EPA's FIP is at issue in abeyance until September 26, 2017. On October 2, 2017, the court subsequently issued an order that continued the abeyance until October 31, 2017, as requested by the parties' joint status report.

III. Revisions to BART-Eligible and Subject-to-BART Sources

EPA disapproved the list of BART-Eligible and subject-to-BART sources included in the 2008 AR RH SIP. The 2008 AR RH SIP inadvertently omitted Georgia Pacific Crossett Mill Boiler 6A and 9A from the list of BART-eligible sources in Table 9.1 on page 45; however, Georgia

[10] 82 FR 42627
[11] 82 FR 32284

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Pacific Crossett Mill 6A and 9A were included in the list of BART-eligible sources adopted into APC&EC Regulation No. 19 and submitted with the 2008 AR RH SIP.

Table 1 below is a correction to the list of BART-eligible units in Arkansas in the SIP.

Table 1 Facilities with BART-Eligible Units in the State of Arkansas

BART Source Category Number and Name	Facility Name	Arkansas Facility Identification Number	Unit ID	Unit Description
1. Fossil fuel-fired Electric Plants > 250 million British thermal units (MMbtu)/hour – Electric Generating Units (EGUs)	AECC Carl E. Bailey	74-00024	SN-01	Boiler
	AECC McClellan	52-00055	SN-01	Boiler
	Entergy Lake Catherine Plant	30-00011	SN-03	Unit 4 Boiler
	Entergy Ritchie	54-00017	SN-02	Unit 2
	Entergy White Bluff	35-00110	SN-01	Unit 1 Boiler
			SN-02	Unit 2 Boiler
			SN-05	Auxiliary Boiler
	SWEPCO Flint Creek Power Plant	04-00107	SN-01	Boiler
3. Kraft Pulp Mills	Domtar Industries, Inc. Ashdown Mill	41-00002	SN-03	#1 Power Boiler
			SN-05	#2 Power Boiler
	Delta Natural Kraft and Mid America Packaging, LLC.	35-00017	SN-02	Recovery Boiler
	Evergreen Packaging Inc., Pine Bluff Mill	35-00016	SN-04	#4 Recovery Boiler
	Georgia-Pacific Corporation Crossett Paper Operations	02-00013	SN-19	6A Boiler
			SN-22	9A Boiler

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	Green Bay Packaging, Inc. Arkansas Kraft Division	15-00001	SN-05A	Recovery Boiler
	Potlatch Forest Products Corporation – Cypress Bend Mill	21-00036	SN-04	Power Boiler
11. Petroleum Refineries	Lion Oil Company	70-00016	SN-809	#7 Catalyst Regenerator
15. Sulfur Recovery Plant	Albemarle Corporation South Plant	14-00028	SR-01	Tail Gas Incinerator
19. Sintering Plants	Big River Industries	18-00082	SN-01	Kiln A
21. Chemical Processing Plants	Albemarle Corporation South Plant	14-00028	BH-01 BH-02	Boiler #1 Boiler #2
	FutureFuel Chemical Co.	32-00036	6M01-01	3 Coal Boilers
	El Dorado Chemical Company	70-00040	SN-08 SN-09 SN-10	West Nitric Acid Plant East Nitric Acid Plant Nitric Acid Concentrator

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Although EPA initially disapproved ADEQ's determination in the 2008 AR RH SIP that Georgia Pacific Crossett Mill Boiler 6A and 9A did not cause or contribute to visibility impairment in a Class I area and were not subject to BART, EPA reversed its decision in the 2016 AR RH FIP and concurred with ADEQ that Georgia Pacific Crossett Mill Boiler 6A and 9A are not subject to BART. Therefore, no revisions are necessary to the list of subject-to-BART sources in Arkansas included in the 2008 AR RH SIP.

Table 2 lists the subject-to-BART sources in Arkansas.

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Table 2 Facilities with Subject-to-BART Units in the State of Arkansas

BART Source Category Number and Name	Facility Name	Arkansas Facility Identification Number	Unit ID	Unit Description
1. Fossil fuel-fired Electric Plants > 250 million British thermal units (MMbtu)/hour – Electric Generating Units (EGUs)	AECC Carl E. Bailey	74-00024	SN-01	Boiler
	AECC McClellan	52-00055	SN-01	Boiler
	Entergy Lake Catherine Plant	30-00011	SN-03	Unit 4 Boiler
	Entergy White Bluff	35-00110	SN-01	Unit 1 Boiler
			SN-02	Unit 2 Boiler
			SN-05	Auxiliary Boiler
	SWEPCO Flint Creek Power Plant	04-00107	SN-01	Boiler
3. Kraft Pulp Mills	Domtar Industries, Inc. Ashdown Mill	41-00002	SN-03	#1 Power Boiler
			SN-05	#2 Power Boiler

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IV. Revisions to BART Determinations

Among the provisions disapproved in EPA's 2012 action on the 2008 AR RH SIP, were several BART determinations. Specifically, EPA disapproved the:

- SO_2, NOx, and PM BART determinations for AECC Bailey Plant Unit 1;
- SO_2, NOx, and PM BART determinations for AECC McClellan Plant Unit 1;
- SO_2 and NOx BART determinations for SWEPCO Flint Creek Plant Boiler No. 1;

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- SO_2, NOx, and PM BART determinations for the fuel oil firing scenario and NOx BART determination for the natural gas firing scenario at Entergy Lake Catherine Plant Unit 4;
- SO_2 and NOx BART determinations under both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Units 1 and 2;
- BART determination for Entergy White Bluff Plant Auxiliary Boiler;
- SO_2 and NOx BART determinations for Domtar Ashdown Mill Power Boiler No. 1; and
- SO_2, NOx, and PM BART determinations for Domtar Ashdown Mill Power Boiler No. 2.

EPA did approve the following BART determinations:

- PM determination on SWEPCO Flint Creek Plant Boiler No. 1;
- SO_2 and PM determinations for the natural gas firing scenario for Entergy Lake Catherine Plant Unit 4;
- PM determinations for both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Plant Units 1 and 2; and
- PM determination for Domtar Ashdown Mill Power Boiler No. 1.

In this SIP revision, ADEQ is addressing all disapproved emissions limitations and compliance schedules. All emissions limitations, including those previously approved SIP provisions in Regulation No. 19 Chapter 15, will be rendered enforceable through AOs with each subject-to-BART source. ADEQ requests that EPA withdraw previously SIP-approved BART determinations contained in APC&EC Regulation No. 19 Chapter 15 and approve these AOs into the SIP.

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The statutory five factors established in U.S.C. § 7491(g)(2) were analyzed for each subject-to-BART unit. These analyses and the emissions limitations determined thereupon are summarized in Sections IV.A–F of this SIP. The analyses are provided in Appendices A–E. Pursuant to Ark. Code Ann. § 8-4-317, ADEQ also considered the factors set forth in Ark. Code Ann. § 8-4-312 for emissions limitations included in this SIP revision to satisfy BART requirements. The emissions limitations included in this SIP are based upon generally accepted scientific knowledge and engineering practices. The need for each measure in attaining or maintaining the national ambient air quality standards is not applicable to the regional haze program. Table 3 describes how each factor set forth in Ark. Code Ann. § 8-4-312 was considered.

Table 3 Consideration of Ark. Code Ann. § 8-4-312 for BART Limitations

Ark. Code Ann. § 8-4-312 Factors	Consideration of the Factors
(1) The quantity and characteristics of air contaminants and the duration of their presence in the atmosphere that may cause air pollution in a particular area of the state;	These characteristics were considered in modeling conducted for each source's BART analysis.

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(2) Existing physical conditions and topography;	Modeling in support of the emissions limitations established in this SIP utilizes these factors as inputs.
(3) Prevailing wind directions and velocities;	Modeling in support of the emissions limitations established in this SIP utilizes these factors as inputs.
(4) Temperatures and temperature-inversion periods, humidity, and other atmospheric conditions;	Modeling in support of the emissions limitations established in this SIP utilizes these factors as inputs.
(5) Possible chemical reactions between air contaminants or between such air contaminants and air gases, moisture, or sunlight;	Modeling in support of the emissions limitations established in this SIP utilizes these factors as inputs.
(6) The predominant character of development of the area of the state such as residential, highly developed industrial, commercial, or other characteristics	The predominant character of development of the area of the state impacted by this SIP includes Class I areas—specifically Upper Buffalo and Caney Creek Wilderness Areas. The Class I areas are protected and remain deliberately undeveloped. Furthermore enhanced visibility in these areas will benefit the primary driver of development around Class I areas: tourism.
(7) Availability of air-cleaning devices;	Availability of air cleaning devices was considered as part of each BART analysis.
(8) Economic feasibility of air-cleaning devices	Economic feasibility of air cleaning devices was considered as part of each BART analysis.
(9) Effect on normal human health of particular air contaminants	This factor is not applicable to the regional haze program, which targets visibility improvements.
(10) Effect on efficiency of industrial operation resulting from use of air-cleaning devices;	Effect on efficiency of air cleaning devices was considered as part of each BART analysis.
(11) The extent of danger to property in the	This factor is not applicable to the regional

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area reasonably to be expected from any particular air contaminant;	haze program, which targets visibility improvements.
(12) Interference with reasonable enjoyment of life by persons in the area and conduct of established enterprises that can reasonably be expected from air contaminants;	Visibility improvements are expected to occur at Arkansas Class I areas in the State as a result of the emissions limitations included in this SIP. Visitors to Caney Creek and Upper Buffalo Wilderness Areas are expected to enjoy these improvements. Persons that conduct tourism enterprises may also benefit as a result of the BART controls required in this SIP. Costs of control may be passed on to customers of the sources for which ADEQ is establishing emissions limitations; however, these costs are anticipated to be lower in this SIP than in the AR RH FIP that this SIP seeks to replace.
(13) The volume of air contaminants emitted from a particular class of air contamination sources;	The volume of air contaminants emitted from subject-to-BART sources for which controls are included in this SIP are factored into the BART analysis.
(14) The economic and industrial development of the state and the social and economic value of the air contamination sources;	Costs of control may be passed on to customers of the sources for which ADEQ is establishing emissions limitations. This may have a negative impact on economic and industrial development in the State. However, these costs are anticipated to be lower in this SIP than in the AR RH FIP that this SIP seeks to replace.
(15) The maintenance of public enjoyment of the state's natural resources; and	Visibility improvements are expected to occur at Arkansas Class I areas in the State as a result of the emissions limitations included in this SIP. Visitors to Caney Creek and Upper Buffalo Wilderness Areas are expected to enjoy these improvements. Persons that conduct tourism enterprises may also benefit as a result of the BART

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	controls required in this SIP.
(16) Other factors that the department or the commission may find applicable.	Other factors considered by the Department in setting BART controls for subject-to-BART sources are contained in the Sections IV.A–F and Appendices A–E of this SIP.

B. Arkansas Electric Cooperative Corporation Carl E. Bailey Generating Station

AECC produced a BART analysis (dated March 2014, Version 4) for the Carl E. Bailey Generating Station. EPA used this analysis in the development of the AR RH FIP and ADEQ has made its BART determination included in this SIP based on the analysis provided by AECC. This analysis is provided in Appendix A of this SIP and summarized below.

AECC Bailey Plant Unit 1 is a 122 megawatt wall-fired boiler installed in 1966. Unit 1 has a maximum heat input of 1,350 million British thermal units per hour (MMBtu/hr). AECC Bailey Plant Unit 1 burns pipeline quality natural gas as the primary fuel and No. 6 fuel oil as a secondary fuel. AECC Bailey Plant Unit 1 meets the BART-eligibility criteria. Also, ADEQ determined, based on results of previous air dispersion modeling, that the AECC Bailey Plant Unit 1 contributes greater than 0.5 dv to visibility impairment in at least one Class I area. Although, more recent modeling conducted by Trinity Consultants (Trinity) shows impacts for AECC Bailey Unit 1 that are less than 0.5 dv, AECC conducted a complete BART analysis and identified the AECC Bailey Plant Unit 1 source as the sole AECC Bailey source subject to BART. Consequently, the five BART statutory factors were considered for AECC Bailey Unit 1.

1. Summary of BART Analysis for SO_2

The available control options for AECC Bailey Plant Unit 1 when burning fuel oil are flue gas desulfurization (FGD) systems and fuel switching. No control technologies were evaluated for natural gas burning scenarios due to the intrinsically low sulfur content of natural gas. FGD systems were considered technically infeasible. Fuel switching was the only technically feasible control option.

Fuel oil stored at AECC Bailey since 2006 had an average sulfur content of 1.81% by weight, therefore one percent sulfur No. 6 fuel oil, 0.5% sulfur No. 6 fuel oil, and diesel were considered. Fuel switching to one percent sulfur fuel oil at AECC Bailey Plant Unit 1 would result in up to a forty-five percent control efficiency for SO_2. Switching to 0.5% fuel oil would result in a seventy-two percent control efficiency and switching to 0.05% sulfur diesel would result in a ninety-seven percent control efficiency.

a. Existing Controls in Use at the Source

AECC Bailey does not have existing SO_2 control technology.

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b. Cost of Compliance

The fuel-switching options evaluated do not require capital investments in equipment; therefore, annual costs are based upon operation and maintenance costs associated with the different fuels. The cost-effectiveness of switching to one percent sulfur No. 6 fuel oil is $1,198/ton of SO_2 reduced. The cost-effectiveness of switching to 0.5% sulfur No. 6 fuel oil is $2,559/ton. The cost-effectiveness of switching to diesel is $5,382/ton, which is out of the range typically identified as cost-effective. Both 0.5% sulfur No. 6 fuel oil and one percent sulfur No. 6 fuel oil were within the range typically considered cost-effective.

c. Energy and Nonair Quality Environmental Impacts

AECC concluded that there are no energy or nonair quality impacts associated with fuel switching.

d. Remaining Useful Life

The remaining useful life of Bailey Unit 1 does not impact the annualized costs of evaluated control technologies since it is assumed that fuel switching will not require any significant capital costs.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated technologies are included in Table 5-13 at page 5-12 of AECC's BART analysis. Fuel switching to one percent sulfur No. 6 fuel oil would result in a 41.52% reduction in visibility impairment from AECC Bailey at Caney Creek Wilderness Area, a 44.25% reduction at Upper Buffalo Wilderness Area, a 44.02% reduction at Hercules Glades Wilderness Area, and a 45.65% reduction at Mingo Wilderness Area. Fuel switching to 0.5% sulfur No. 6 fuel oil would result in a 56.97% reduction in visibility impairment from AECC Bailey at Caney Creek Wilderness Area, a 63.51% reduction at Upper Buffalo Wilderness Area, a 63.32% reduction at Hercules Glades Wilderness Area, and a 55.15% reduction at Mingo Wilderness Area.

f. BART Requirements for SO_2

Based on cost/ton of SO_2 emissions reduced and visibility improvement among low sulfur fuels, AECC determined that SO_2 BART for AECC Bailey Plant Unit 1 is using fuel oil and natural gas with 0.5% sulfur or less. ADEQ concurs with AECC's BART determination for SO_2 at Bailey Plant Unit 1.

AO LIS No. xx includes enforceable limitations and compliance dates consistent with ADEQ's BART determination.

2. Summary of BART Analysis for PM

Available PM retrofit control technologies include: dry electrostatic precipitator (Dry ESP), wet electrostatic precipitator (Wet ESP), fabric filter, wet scrubber, a cyclone, and fuel switching. Dry ESP and fabric filters were considered technically infeasible.

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A Wet ESP, with an estimated PM control efficiency of up to ninety percent, is a technically feasible option for PM control.

The use of a wet scrubber, with an estimated PM removal efficiency of around fifty-five percent, is a technically feasible option.

A cyclone is a technically feasible option. When clean oil is combusted, a high percentage of small particles are emitted and cyclones are not effective at controlling the smaller particles that are the primary source of visibility impairment, although when including the larger particles an eighty-five percent reduction in PM can be expected.

Fuel switching to lower sulfur content fuel is a technically feasible option. Reductions in filterable PM for No. 6 fuel oil are directly related to the sulfur content of the fuel and greater than a ninety-nine percent reduction of PM is expected solely from a fuel switch to natural gas.

a. Existing Controls in Use at the Source

AECC Bailey does not have existing PM control technology.

b. Cost of Compliance

The cost of compliance differs among the control technologies evaluated. Add-on controls such as Wet ESP, wet scrubber, and cyclone systems involve capital costs for new equipment that were annualized over a fifteen year period for the analysis. Fuel-switching options have associated operation and maintenance costs, but no capital costs. The cost-effectiveness values of all evaluated options exceed $22,000/ton of PM removed, which is higher than the range typically considered cost-effective.

c. Energy and Nonair Quality Environmental Impacts

AECC concluded that there are no energy or nonair quality impacts associated with fuel switching; however, there are impacts associated with wet ESPs and wet scrubbers. These impacts were factored into the cost of compliance.

d. Remaining Useful Live

AECC anticipated that the remaining useful life of the AECC Bailey Plant Unit 1 is at least as long as the capital cost recovery period of fifteen years.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated add-on technologies are included in Table 7-8 at page 7-9 of AECC's BART analysis and improvements that would be anticipated from fuel switching are included in Table 5-13 at page 5-12. Although no control options were considered cost-effective for PM, AECC determined that switching to 0.5% sulfur No. 6 fuel oil was cost-effective for SO_2. Visibility improvements anticipated from fuel switching to a lower sulfur content fuel oil are discussed in section IV.A.1.e. above.

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f. BART Requirements for PM

AECC proposed that no fuel changes or add-on controls constitute PM BART for AECC Bailey Unit 1. In addition, the BART determination for SO_2 of fuel switching to 0.5 % sulfur No. 6 fuel oil will result in PM reductions. ADEQ concurs with this AECC's BART determination for PM at Bailey Plant Unit 1.

C. Arkansas Electric Cooperative Corporation John L. McClellan Generating Station

AECC produced a BART analysis (dated March 2014, Version 4) for the John L. McClellan Generating Station. EPA used this analysis in the development of the AR RH FIP and ADEQ has made its BART determination included in this SIP based on the analysis provided by AECC. This analysis is provided in Appendix A of this SIP and summarized below.

AECC McClellan Plant Unit 1 is a 122 megawatt wall-fired boiler installed in 1971. AECC McClellan Plant Unit 1 has a maximum heat input of 1,436 MMBtu/hr. AECC McClellan Plant Unit 1 burns pipeline quality natural gas as the primary fuel and No. 6 fuel oil as a secondary fuel. AECC McClellan Plant Unit 1 meets the BART-eligibility criteria. Also, ADEQ determined, based on results of previous air dispersion modeling, that the AECC McClellan Plant Unit 1 contributes greater than 0.5 dv to visibility impairment in at least one Class I area. Therefore, AECC conducted a complete BART analysis and identified the AECC McClellan Plant Unit 1 source as the sole AECC McClellan source subject to BART. Consequently, the five BART statutory factors were considered for AECC McClellan Unit 1.

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1. Summary of BART Analysis for SO_2

The available control options for AECC McClellan Unit 1 when burning fuel oil are FGD systems and fuel switching. No control technologies were evaluated for natural gas burning scenarios due to the intrinsically low sulfur content of natural gas. FGD systems were considered technically infeasible. Fuel switching was the only technically feasible control option.

Fuel oil stored at AECC McClellan since 2009 had an average sulfur content of 1.38 percent by weight, therefore one percent sulfur No. 6 fuel oil, 0.5% sulfur No. 6 fuel oil, and diesel were considered. Fuel switching to one percent sulfur fuel oil at AECC McClellan Plant Unit 1 would result in up to a twenty-eight percent control efficiency for SO_2. Switching to 0.5% fuel oil would result in a sixty-four percent control efficiency and switching to 0.05% sulfur diesel would result in a ninety-six percent control efficiency.

a. Existing Controls in Use at the Source

AECC McClellan does not have existing SO_2 control technology.

b. Cost of Compliance

The fuel-switching options evaluated do not require capital investments in equipment; therefore, annual costs are based upon operation and maintenance costs associated with the different fuels. The cost-effectiveness of switching to one percent sulfur No. 6 fuel oil is $2,457/ton of SO_2 reduced. The cost-effectiveness of switching to 0.5% sulfur No. 6 fuel oil is $4,553/ton. The cost-

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effectiveness of switching to diesel is $10,698/ton, which is out of the range typically identified as cost-effective. Both 0.5% sulfur No. 6 fuel oil and one percent sulfur No. 6 fuel oil were within the range typically considered cost-effective.

c. Energy and Nonair Quality Environmental Impacts

AECC concluded that there are no energy or nonair quality impacts associated with fuel switching.

d. Remaining Useful Life

The remaining useful life of McClellan 1 does not impact the annualized costs of evaluated control technologies since it is assumed that fuel switching will not require capital investments in new equipment.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated technologies are included in Table 5-13 at page 5-12 of AECC's BART analysis. Fuel switching to one percent sulfur No. 6 fuel oil would result in a 13.67% reduction in visibility impairment from AECC McClellan at Caney Creek Wilderness Area, a 13.16% reduction at Upper Buffalo Wilderness Area, a 12.55% reduction at Hercules Glades Wilderness Area, and a 15.35% reduction at Mingo Wilderness Area. Fuel switching to 0.5% sulfur No. 6 fuel oil would result in a 48.23% reduction in visibility impairment from AECC McClellan at Caney Creek Wilderness Area, a 45.11% reduction at Upper Buffalo Wilderness Area, a 50.22% reduction at Hercules Glades Wilderness Area, and a 40.35% reduction at Mingo Wilderness Area.

f. BART Requirements for SO_2

Based on cost/ton of SO_2 emissions reduced and visibility improvement among low sulfur fuels, AECC determined that SO_2 BART for AECC McClellan Plant Unit 1 is using fuel oil and natural gas with 0.5% sulfur or less. ADEQ concurs with AECC's BART determination for SO_2 at McClellan Plant Unit 1.

AO LIS No. xx includes enforceable limitations and compliance dates consistent with ADEQ's BART determination.

2. Summary of BART Analysis for PM

Available PM retrofit control technologies include: Dry ESP, Wet ESP, fabric filters, wet scrubber, a Cyclone, and fuel switching. Dry ESP and fabric filters were considered technically infeasible.

A Wet ESP, with an estimated PM control efficiency of up to ninety percent, is a technically feasible option for PM control.

The use of a wet scrubber, with an estimated PM removal efficiency of around fifty-five percent, is a technically feasible option.

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A cyclone is a technically feasible option. When clean oil is combusted, a high percentage of small particles are emitted and cyclones are not effective at controlling the smaller particles that are the primary source of visibility impairment, although when including the larger particles an eighty-five percent reduction in PM can be expected.

Fuel switching to lower sulfur content fuel is a technically feasible option. Reductions in filterable PM for No. 6 fuel oil are directly related to the sulfur content of the fuel and greater than a ninety-nine percent reduction of PM is expected solely from a fuel switch to natural gas.

a. Existing Controls in Use at the Source

AECC McClellan does not have existing PM control technology.

b. Cost of Compliance

The cost of compliance differs among the control technologies evaluated. Add-on controls such as Wet ESP, wet scrubber, and cyclone systems involve capital costs for new equipment that were annualized over a fifteen year period for the analysis. Fuel-switching options have associated operation and maintenance costs, but no capital costs. The cost-effectiveness of all evaluated options exceeds $14,000/ton of PM removed, which is higher than the range typically considered cost-effective.

c. Energy and Nonair Quality Environmental Impacts

AECC concluded that there are no energy or nonair quality impacts associated with fuel switching; however, there are impacts associated with wet ESPs and wet scrubbers. These impacts were factored into the cost of compliance.

d. Remaining Useful Live

AECC anticipated that the remaining useful life of the AECC McClellan Plant Unit 1 is at least as long as the capital cost recovery period of fifteen years.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated add-on technologies are included in Table 7-9 at page 7-10 of AECC BART analysis and improvements that would be anticipated from fuel switching are included in Table 5-14 at page 5-13. Although no control options were considered cost-effective for PM, AECC determined that switching to 0.5% sulfur No. 6 fuel oil was cost-effective for SO_2. Visibility improvements anticipated from fuel switching to a lower sulfur content fuel oil are discussed in section IV.A.1.e. above.

f. BART Requirements for PM

AECC proposed that no fuel changes or add-on controls constitute PM BART for AECC McClellan Unit 1. In addition, the BART determination for SO_2 of fuel switching to 0.5 % sulfur No. 6 fuel oil will result in PM reductions. ADEQ concurs with this AECC's BART determination for PM at McClellan Plant Unit 1.

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D. Domtar Industries, Inc. Ashdown Mill

Domtar produced a revised BART analysis (dated May 2014) for Domtar Ashdown Mill that updated emissions information from previous BART analyses (dated October 2006 and March 2007). These BART analyses were used by EPA in the AR RH FIP and ADEQ has made its BART determination included in this SIP based on these analyses. On xx xx, 2017 Domtar provided additional information to ADEQ regarding an alternative to BART that would achieve greater visibility improvements than the BART controls included in the AR RH FIP. The 2007 and 2014 BART analyses, as well as the alternative to BART analysis, are provided in Appendix B of this SIP and summarized below.

Domtar Ashdown Mill has two power boilers subject to BART: Power Boiler No. 1 and Power Boiler No. 2. Power Boiler No. 1 was installed in 1967–68 and has a design heat input rate of 580 MMBtu/hr. Power Boiler No. 1 is capable of burning a variety of fuels including bark, wood waste, tire-derived fuel, municipal yard waste, pelletized paper fuel, fuel oil, reprocessed fuel oil and natural gas; however, Power Boiler No. 1 is currently restricted by permit to burning natural gas. Power Boiler No. 2 was installed in 1975 and has a design heat input rate of 820 MMBtu/hr. Power Boiler No. 2 is capable of burning a variety of fuels including bark, pulverized bituminous coal, tire-derived fuel, pelletized paper fuel, municipal yard waste, natural gas, and petroleum coke. Domtar Ashdown Mill Power Boilers No. 1 and No. 2 meet the BART-eligibility criteria. Dispersion modeling of emissions from Domtar Ashdown Mill included in the 2008 AR RH SIP shows that the mill contributes greater than 0.5 dv to visibility impairment in at least Class I area. Therefore, Domtar Ashdown Mill Power Boilers No. 1 and No. 2 are subject-to-BART and the five BART statutory factors were considered for each boiler.

1. Summary of BART Analyses for SO_2

a. Power Boiler No. 1

In 2007, Domtar installed a Wet ESP on Power Boiler No. 1 to achieve the maximum achievable control technology standards required under 40 C.F.R. part 63 subpart DDDDD—"National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial Commercial and Institutional Boilers and Process Heaters." Installation of the Wet ESP on Power Boiler No. 1 resulted in reductions in PM and SO_2 emissions from Power Boiler No. 1 from the original 2001–2003 baseline used in modeling for the 2008 AR RH SIP. Therefore, Domtar remodeled emission impacts from Power Boiler No. 1 based on a 2009–2011 baseline. Based on the revised modeling, visibility impacts due to SO_2 emissions from Power Boiler No. 1 are already very low (<0.335 dv) and any emissions reductions associated installation and operation of SO_2 controls would be negligible. In the AR RH FIP, EPA concluded that the cost of controls for SO_2 for Power Boiler No. 1 could not be justified due to the negligible visibility impacts of Power Boiler No. 1 with the existing control technology; therefore, EPA established that the SO_2 BART limitation for Power Boiler No. 1 when burning bark, wood waste, tire-derived fuel, municipal

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yard waste, pelletized paper fuel, fuel oil, or reprocessed fuel oil is 504 lb/day on a rolling 30-boiler-operating day averaging period based on operation of existing controls. In the AR RH FIP, EPA also finalized an alternative to demonstrating compliance with their SO_2 BART determination for Power Boiler No. 1. In lieu of reporting and recordkeeping requirements associated with meeting the SO_2 BART emissions limitation for Power Boiler No. 1, the AR RH FIP allowed Domtar to demonstrate compliance by revising its air permit to reflect that Power Boiler No. 1 is allowed to burn only pipeline quality natural gas. On October 18, 2016, a permit modification was issued for Domtar with a specific condition requiring Domtar to combust only pipeline quality natural gas at Power Boiler No. 1.[12]

ADEQ concurs with EPA on the SO_2 BART determination for Power Boiler No. 1 that no additional controls are necessary. In light of recent changes to Domtar's air permit, ADEQ has determined SO_2 BART for Power Boiler No. 1 is satisfied by Domtar's fuel switch to natural gas.

b. Power Boiler No. 2

The available SO_2 retrofit control technology options for Domtar Power Boiler No. 2 include upgrades to existing venturi scrubbers and a new add-on spray scrubbers that would be operated downstream of the existing scrubbers. Both control options were considered technologically feasible.

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Domtar was unable to quantify the marginal additional control that could be achieved through upgrades to the existing venturi scrubbers, which are already capable of ninety percent control efficiency for SO_2; however, average control efficiency based on 2011–2013 data is closer to sixty-nine percent according to EPA in the AR RH FIP. An add-on spray scrubber would result in ninety percent control of SO_2 remaining downstream of the existing venturi scrubbers.

i. Existing Controls in Use at the Source

Domtar Ashdown Mill Power Boiler No. 2 is equipped with two venturi wet scrubbers.

ii. Cost of Compliance

Domtar estimated that, based on their annual-average baseline emission rate of 2,078 tpy, the cost-effectiveness of an add-on spray scrubber would be $5,300/ton without consideration of additional construction at the facility that would be necessary to accommodate the add-on spray scrubber. This falls outside of the range that is typically considered cost-effective. In the AR RH FIP, EPA also included an additional BART option not considered by Domtar: optimization of the existing venturi scrubbers by using additional scrubbing reagent to achieve closer to the ninety percent control efficiency rating of the scrubbers. The control efficiency of using additional scrubbing reagent is $1,411/ton SO_2.

[12] 287-AOP-R18

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iii. Energy and Nonair Quality Environmental Impacts

No energy or nonair quality environmental impacts associated with the evaluated controls were identified in Domtar's analysis or EPA's analysis.

iv. Remaining Useful Life

The remaining useful life for Domtar Power Boiler No. 2 is anticipated to be at least as long as the thirty-year life of the add-on spray scrubbers evaluated.

v. Degree of Visibility Improvement as a Result of Controls

Installation and operation of an add-on spray scrubber for Power Boiler No. 2 would have a 0.146 dv or less impact at any given Class I areas. In the AR RH FIP, EPA concluded that the limited visibility improvement that would be achieved by installation and operation of an add-on spray scrubber does not justify their high cost-effectiveness and ADEQ concurs. Optimization of the existing venturi scrubbers by using additional scrubbing reagent would result in a 0.139 dv impact or less at any given Class I area.

vi. BART Requirements for SO_2

Given the low cost-effectiveness value associated with the modeled visibility improvement, EPA determined that additional scrubbing reagent is BART for Power Boiler No. 2. ADEQ concurs with this determination and the emissions limitation for SO_2 BART at Power Boiler No. 2 of 91.5 lb SO_2/hr on a 30 boiler-operating day averaging period.

2. Summary of BART Analysis for NOx

The available NOx retrofit control technology options for Domtar Ashdown Mill Power Boilers No. 1 and No. 2 include: selective non-catalytic reduction (SNCR), selective catalytic reduction (SCR), low NOx burners (LNB) and ultra-low NOx burners (ULNB), over-fire air (OFA), reburning/Methane de-NOx (MdN), flue gas recirculation (FGR), and fuel blending/boiler operational modifications/tuning/optimization.

a. Power Boiler No. 1

FGR, LNB, ULNB, OFA, MdN, and SCR were considered to be technically infeasible for use at Power Boiler No. 1. Domtar's NOx BART analysis for Power Boiler No. 1 focused on SNCR.

SNCR is a post-combustion NOx control technology that uses urea or ammonia to reduce NOx to nitrogen and water. For boilers with steady flue gas flow patterns and temperature distribution, SNCR typically achieves about a fifty percent NOx reduction; however, SNCR on boilers that operate with changing loads are unlikely to achieve greater than a thirty percent NOx reduction according to the National Council for Air and Stream Improvement. Therefore, Domtar provided NOx emission reduction and cost-effectiveness estimates for three control efficiency scenarios at

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Domtar Ashdown Power Boiler No. 1: 20%, 32.5%, and 45%.

i. Existing Controls in Use at the Source

Fuel blending/boiler operational modifications/tuning/optimization is already in use at Power Boiler No. 1.

ii. Cost of Compliance

Based on actual annual average emissions at Power Boiler No. 1, Domtar estimated that cost-effectiveness for the different SNCR scenarios would range from $7,640–$12,700/ton of NOx.

iii. Energy and Nonair Quality Environmental Impacts

No energy or nonair quality environmental impacts associated with SNCR were identified in Domtar's analysis.

iv. Remaining Useful Life

The remaining useful life for Domtar Power Boiler No. 1 is anticipated to be at least as long as the thirty-year life of the SNCR system evaluated.

v. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from the various SNCR control efficiencies are included in Table 6-3 at page 6-3 of Domtar's 2014 BART analysis. Because Power Boiler No. 1 does not contribute to visibility impairment greater than 0.5 dv on any single day at any of Arkansas's or Missouri's Class I areas, the modeled visibility improvements anticipated as a result of installation of evaluated NOx control technologies on Power Boiler No. 1 are minimal (< 0.017 Δdv).

vi. BART Requirements for NOx

Based on these cost-effectiveness estimates, ADEQ has determined SNCR is not BART for Power Boiler No. 1. EPA similarly determined that SNCR is not BART for Power Boiler No. 1 and that compliance with an emissions rate of 207.4 lb/hr (Power Boiler No. 1's baseline emissions rate) was sufficient to meet BART requirements for NOx at Power Boiler No. 1. ADEQ concurs with EPA on the determination that NOx BART for Power Boiler No. 1 is an emissions limitation of 207.4 lb NOx/hr limitation on a rolling 30-boiler-operating-day average for Power Boiler No. 1.

b. Power Boiler No. 2

For Power Boiler No. 2, FGR, OFA, MdN, ULNB, and SCR were considered to be technically infeasible. Domtar's 2014 BART analysis focused on LNB and SNCR. LNB is a combustion technology that uses an advanced burner design to reduce NOx formation and can achieve a

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control efficiency of up to twenty-five percent. For SNCR, two control-efficiency scenarios were evaluated: 27.5% and 35%.

i. Existing Controls in Use at the Source

Domtar did not identify any existing NOx controls on Power Boiler No. 2.

ii. Cost of Compliance

Cost-effectiveness for SNCR at Power Boiler No. 2 ranged from $1,909–$1,998/ton of NOx and cost-effectiveness for LNB was $1,951. Although the thirty-five percent control efficiency scenario for SNCR was the most cost-effective option, the technical feasibility of achieving that level of control at Power Boiler No. 2 is uncertain to due to the variability of steam demand and furnace temperature.

iii. Energy and Nonair Quality Environmental Impacts

No energy or nonair quality environmental impacts associated with SNCR were identified in Domtar's analysis.

iv. Remaining Useful Life

The remaining useful life for Domtar Power Boiler No. 2 is anticipated to be at least as long as the thirty-year life of the SNCR and LNB systems evaluated.

v. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from the various SNCR control efficiencies are included in Table 6-3 at page 6-3 of Domtar's 2014 BART analysis. SNCR at 27.5% control efficiency would be anticipated to improve visibility by 0.166 dv at Caney Creek Wilderness Area. LNB at thirty percent control efficiency would be anticipated to improve visibility by 0.181 dv at Caney Creek Wilderness Area. SNCR at thirty-five percent control efficiency would be anticipated to improve visibility by 0.212 dv.

vi. BART Requirements for NOx

Domtar proposed a NOx BART emissions limitation of 345 lb/hr based on a six percent decrease in NOx emissions considered achievable for Power Boiler No. 2 using SNCR or LNB. Domtar was uncertain whether the evaluated control efficiencies for LNB and SNCR were achievable based on unit-specific considerations for Power Boiler No. 2. EPA included this emissions limitation in the AR RH FIP and ADEQ concurs with this determination.

3. BART Requirements for PM

Power Boilers No. 1 and 2 are required to comply with maximum achievable control technology

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standards required under 40 C.F.R. part 63 subpart DDDDD—"National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial Commercial and Institutional Boilers and Process Heaters." Consistent with EPA's determination in the AR RH FIP, ADEQ concludes that it is unlikely that emission controls more stringent than MACT standards could be identified within reasonable cost-effectiveness parameters for BART. Therefore, ADEQ has determined that compliance with 40 C.F.R. part 63 subpart DDDDD is PM BART for Power Boilers No. 1 and No. 2.

4. Alternative to BART Requirements

On Month Day,2017, Domtar provided to ADEQ an additional option for consideration as an alternative to BART based on changing boiler operations as part of their planned transition from paper production to fluff pulp production. This alternative would result in greater visibility improvement than the emissions limitations included in the AR RH FIP and Paragraphs IV.C.1., 2., and 3. of this SIP revision. This option was modeled using emission rates for Power Boiler No. 1 based on combustion of natural gas and the following emissions limitations for Power Boiler No. 2: 435 lb/hour SO_2, 293 lb/hr NOx, and 81.6 lb/hr PM.

The RHR requires the following three elements for any alternative to BART:

(1) A demonstration that the emissions trading program or other alternative measure will achieve greater reasonable progress than would have resulted from the installation and operation of BART at all sources subject to BART in the State and covered by the alternative program.[13]
(2) A requirement that all necessary emissions reductions take place during the period of the first long-term strategy for regional haze.[14]
(3) A demonstration that the emissions reductions resulting from the alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP.[15]

In the xx technical support document included in Appendix B of this SIP, Domtar demonstrates that the proposed alternative would result in a visibility improvement of 0.349 dv at Caney Creek, the Class I area most impacted by Domtar, which is greater than the visibility improvement anticipated from all BART controls at Domtar (0.320 deciviews). [Insert language about other three wilderness areas.] The emissions reductions proposed are based on changes in operational scenarios for Domtar and are surplus to reductions required to meet other Clean Air Act requirements as of the 2000–2004 baseline of 2008 AR RH SIP, as revised by Arkansas. Therefore, compliance with the alternative to BART proposed by Domtar meets RHR requirements if compliance with the alternative to BART takes place during the period of the

[13] 40 CFR 51.308(e)(2)(i)
[14] 40 CFR 51.308(e)(2)(iii)
[15] 40 CFR 51.308(e)(2)(iv)

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first long-term strategy for regional haze (on or before December 31, 2018.)

Because the modeled visibility improvement of this option demonstrates better visibility improvement than continued operation of both Power Boiler No. 1 and No. 2 with the BART limitations included in this SIP, ADEQ has determined that as an acceptable alternative to the BART limitations described in Paragraphs IV.C.1., 2., and 3. of this SIP revision, Domtar may comply with the following emissions limitations listed in Table 4. AO LIS No. xx includes enforceable limitations and compliance dates consistent with this alternative to BART determination.

Table 4 Alternative to BART Emissions Limitations

Subject-to-BART Unit	SO_2	NOx	PM
Power Boiler No. 1	Satisfied by combusting only natural gas	Satisfied by combusting only natural gas	Satisfied by compliance with 40 C.F.R. part 63 subpart DDDDD
Power Boiler No. 2	435 lb/hr	293 lb/hr	Satisfied by compliance with 40 C.F.R. part 63 subpart DDDDD

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E. Entergy Arkansas, Inc. Lake Catherine Plant

Entergy provided a BART analysis (dated June 2013) for burning of natural gas at the Entergy Lake Catherine Generating Station. EPA used this analysis in the construction of the AR RH FIP and ADEQ has made its BART determination included in this SIP based on the analysis provided by Entergy. This analysis is provided in Appendix C of this SIP and summarized below.

Entergy Lake Catherine Plant Unit 4 is a 558 megawatt tangentially-fired boiler installed in 1970. Entergy Lake Catherine Plant Unit 4 has a maximum heat input of 5,850 MMBtu/hr. Entergy Lake Catherine Plant Unit 4 burns pipeline quality natural gas and is capable of burning No. 6 fuel oil as a secondary fuel, although Entergy has committed to not burning fuel oil at this unit. Therefore, emissions from fuel oil were not considered in the BART analysis and the Entergy Lake Catherine Plant Unit 4 must not burn fuel oil until BART determinations are promulgated for this unit for SO_2, NO_X, and PM for the fuel oil firing scenario through EPA action upon and approval of revised BART determinations submitted by the State as a SIP revision. Entergy Lake Catherine Plant Unit 4 meets the BART-eligibility criteria. Also, ADEQ determined, based on results of previous air dispersion modeling, that the Entergy Lake Catherine Plant Unit 4 contributes an existing visibility impairment of greater than 0.5 dv in at least one Class I area. Therefore, Entergy conducted a complete BART analysis and identified the Entergy Lake Catherine Plant Unit 4 source as the sole Entergy Lake Catherine unit subject

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to BART. Consequently, the five BART statutory factors were considered for Entergy Lake Catherine Plant Unit 4.

1. BART Requirements for SO_2

A BART determination for SO_2 based on the use of natural gas was included in the 2008 AR RH SIP and approved in EPA's March 12, 2012, final rule (77 FR 14604). The determination resulted in no SO_2 controls needed during natural gas combustion. Because Entergy has committed to not burning fuel oil, no changes are needed to EPA's determinations with respect to the previously approved SO_2 BART limitations included in Regulation No. 19 because this limitation has been rendered enforceable through an AO included with this SIP revision.

2. BART Requirements for PM

A BART determination for PM at Lake Catherine Plant Unit 4 based on the use of natural gas was included in the 2008 AR RH SIP and approved in EPA's March 12, 2012, final rule (77 FR 14604). The determination resulted in no PM controls needed during natural gas combustion. Because Entergy has committed to not burning fuel oil, no changes are needed to EPA's determinations with respect to the previously approved PM BART limitation included in Regulation No. 19 because the limitation has been rendered enforceable through an AO included with this SIP revision.

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F. Entergy Arkansas, Inc. White Bluff

At the request of ADEQ, Entergy provided an updated BART five-factor analysis for SO_2 for White Bluff (dated August 18, 2017) to supplement previous BART analyses (dated February 2013, October 2013, August 2015, and August 2016) submitted to EPA for their consideration in development of the AR RH FIP. This updated analysis provides new information in light of an updated remaining useful life for White Bluff and evaluates three new control scenarios. Entergy also provided to ADEQ supplemental information on April 5, 2017 detailing cost-effectiveness for dry FGD with various remaining useful life assumptions. ADEQ makes its BART determination included in this SIP based on the updated BART five-factor analysis for SO_2 and previous BART analyses and supplemental information provided by Entergy, and analyses from other stakeholders of interest. These analyses are incorporated by reference and provided in Appendix D of this SIP.

Entergy White Bluff Units 1 and 2 are identical tangentially-fired 850 megawatt boilers, which were installed in 1974, and they have a maximum heat input capacity of 8,950 MMBtu/hr each. These units are currently equipped with electrostatic precipitators (ESPs) to control PM emissions. Entergy White Bluff Units 1 and 2 burn sub-bituminous coal as a primary fuel and burn No. 2 fuel oil or biofuel as a start-up fuel. Entergy White Bluff also has a rarely used 183

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MMBtu/hr auxiliary boiler that burns only No. 2 fuel oil or biodiesel. Entergy White Bluff Units 1 and 2 and the auxiliary boiler meet the BART eligibility criteria. Because modeling demonstrates that the auxiliary boiler's greatest impact on visibility at any Class 1 area is only 0.01 dv, EPA determined that existing emissions limitations for the auxiliary boiler in Entergy's permit satisfy BART for SO_2, NOx, and PM. ADEQ concurs with this determination. Entergy White Bluff Units 1 and 2 contribute greater than 0.5 dv to at least one Class I area. Consequently, the five BART statutory factors were considered for Entergy White Bluff Units 1 and 2.

1. Summary of BART Analyses for SO_2

The available SO_2 retrofit control technology options for White Bluff Units 1 and 2 include: fuel switching to lower sulfur coal, dry sorbent injection (DSI), spray dryer absorber (SDA), circulating dry scrubber (CDS), and Wet FGD. All evaluated options were considered technically feasible.

Fuel switching to coal with a sulfur content of 0.6 lb/MMBtu would result in an 8.75% reduction in SO_2 emissions from baseline levels.

DSI, which is the injection of sorbent into the exhaust gas stream, has a control efficiency that can range from forty to ninety percent based on sorbent particle size, residence time, temperature, and particulate collection equipment. Entergy evaluated two particulate collection methods for DSI at Entergy White Bluff. The first collection method would require retrofits to the currently installed ESP and would achieve a fifty percent SO_2 removal efficiency. The second "enhanced" collection method would require the installation of a baghouse and would achieve an eighty percent SO_2 removal efficiency. Both evaluated DSI technologies would require landfilling of DSI waste

SDA and CDS, both semi-dry scrubbing (Dry FGD) systems, have control efficiencies ranging from sixty to ninety-five percent. Both systems utilize a fine mist of lime slurry sprayed into an absorption tower to absorb SO_2. The resulting calcium sulfite and calcium sulfate are then collected with a fabric filter.

Wet FGD, scrubbing the exhaust gas stream with a lime or limestone slurry, is capable of achieving eighty to ninety-five percent control of SO_2 emissions. This option was eliminated in previous analyses and in the AR RH FIP due to the small incremental difference in visibility improvement between Wet FGD and Dry FGD relative to the marginal cost difference.

a. Existing Controls in Use at the Source

The current permitted emissions rate for Units 1 and 2 at Entergy White Bluff is 1.2 lb SO_2/MMBtu based on the new source performance standard for fossil-fuel fired steam generators. Entergy White Bluff is currently using lower sulfur content coal to minimize costs of compliance with the Acid Rain Program. Using low sulfur coal, Entergy White Bluff has been able to achieve monthly average emissions rates below 0.69 SO_2/MMBtu.[16] The average monthly

[16] Calculated using 2014–2016 monthly SO_2 emissions and heat rate (MMBtu) obtained from the Air Markets

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emissions rate between 2014 and 2016 was 0.55 lb SO_2/MMBTU for Unit 1 and 0.58 lb SO_2/MMbtu for Unit 2. Consequently, Entergy White Bluff has already lowered its visibility impact on potentially impacted federal Class I areas during this planning period beyond what would be expected due to emissions at its permitted emissions rate.

b. Cost of Compliance

The cost of compliance differs among the control technologies evaluated. For some technologies, remaining useful life is a significant factor in determining annual cost. The cost of fuel switching to low sulfur coal is not dependent on the remaining useful life of White Bluff Units 1 and 2 or equipment because no capital investments in equipment are required. Switching to low sulfur coal entails an increased annual cost of operation based on purchase contract terms for the specific sulfur content of the coal. Entergy estimates an increase in operation and maintenance costs based on a $0.50 per ton cost premium to guarantee that the sulfur content of coals is less than 0.6 lb/MMBtu. Thus, the cost-effectiveness for low sulfur coal is approximately $1,150 per ton of SO_2 reduced. The other evaluated control technologies require capital investments in new equipment or retrofit of existing equipment. These capital investments are amortized over the remaining useful life of White Bluff Units 1 and 2 to determine the annual cost-effectiveness of SO_2 emissions reductions. The remaining useful life assumptions are discussed in section IV(E)(1)(d) below. In Entergy's August 18, 2017 revised BART analysis, Entergy redacted certain information held to be a trade secret, including capital costs, remaining useful life, and average cost-effectiveness for DSI, Enhanced DSI, and Dry FGD. They did provide baseline and controlled emission rates, annual cost-effectiveness for low sulfur coal, and incremental cost-effectiveness values of control technologies versus low sulfur coal without redaction. Using these data provided without redaction by Entergy, ADEQ was able to calculate the average cost-effectiveness of each technology. The average cost-effectiveness of DSI is approximately 7,144 per ton and the average cost-effectiveness of "enhanced" DSI is approximately 7,346 per ton. Average cost-effectiveness of Dry FGD systems is approximately7,101 per ton. Cost-effectiveness of Wet FGD was not calculated in the updated five factor analysis because EPA already determined in the AR RH FIP that Wet FGD is not BART because Wet FGD is more expensive than Dry FGD technologies with a 0.028 dv or less incremental impact at Class I areas. The incremental cost of Wet FGD would be even greater considering the updated remaining useful life for Entergy White Bluff Units 1 and 2.

The cost-effectiveness estimates for all control options evaluated, with the exception of low sulfur coal, are greater than what is typically considered cost-effective. Based on these cost-effectiveness estimates, ADEQ concludes that DSI, Dry FGD, and Wet FGD are not BART.

c. Energy and Nonair Quality Environmental Impacts

Entergy indicated that there were energy and adverse nonair quality environmental impacts associated with add-on controls under consideration, such as DSI and Dry FGD. These impacts were factored into costs of compliance.

d. Remaining Useful Life

In the August 18, 2017 updated BART analysis for White Bluff, Entergy amortized costs based on their proposal regarding coal-fired operations. The August 18, 2017 analysis redacted

Program Database https://ampd.epa.gov/ampd/

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Entergy's proposed date; however, the cost-effectiveness for Dry FGD included in the August 18, 2017 analysis corresponds to Dry FGD cost-effectiveness estimates provided in Entergy's April 21, 2017 letter based on a seven-year to eight-year remaining useful life scenario.[17] In comments on the AR RH FIP, Entergy also proposed dates as part of a "multi-unit plan to improve visibility and to better manage generation assets for reliability and costs."[18] In those comments, Entergy proposed to "take an enforceable limit" regarding their proposal regarding coal-fired operations.[19]

Under the guidelines for BART determinations, the remaining useful life calculation should begin on "the date that controls will be put in place" (compliance date) and ending on "the date the facility permanently stops operations."[20] Based on the controls evaluated, the compliance date for controls would be as expeditiously as practicable, but in no event later than five years after approval of the SIP. The guidelines further specify that the permanent operations cessation date should be "assured by a federally- or State-enforceable restriction preventing further operation."[21] Therefore, ADEQ agrees that Entergy's cost-effectiveness calculations are reasonable based on a remaining useful life of seven years and Entergy's proposal to take an enforceable limit regarding coal-fired operations date.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated technologies are included in Tables 4-6 and 4-7 of Entergy's August 18, 2017 analysis at pages 4-7 and 4-8. Based on remaining useful life, DSI, Dry FGD, and Wet FGD were eliminated as BART for SO_2. The remaining evaluated option, switching to low sulfur coal, would result in a 0.129 dv improvement at Caney Creek Wilderness Area and a 0.143 dv improvement at Upper Buffalo Wilderness Area.

f. BART Requirements for SO_2

Based on their analysis, Entergy proposed that BART to control SO_2 emissions from Entergy White Bluff Units 1 and 2 was low sulfur coal with a required emissions rate of 0.6 lb/MMBtu calculated as a 30-day rolling average over each boiler operating day. ADEQ concurs with this determination.

AO LIS No. xx includes enforceable limitations and compliance dates consistent with ADEQ's

[17] In the April 21, 2017 letter included in Appendix D, Entergy estimates that "for a seven- to eight-year [remaining useful life], the cost-effectiveness range in dollars per ton of SO_2 emissions reduced is approximately $6,500–$7,200 based on the full costs and $5,000-$5,500 based on partial costs."

[18] Entergy Arkansas Inc. Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas, at 5 (Aug. 7, 2015) (Docket ID No. EPA-R06-OAR-2015-0189-0153) (hereinafter "EAI Comments").

[19] Id.

[20] 70 FR 39104

[21] Id.

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determination.

2. BART Requirements for PM

A BART determination for PM for Entergy White Bluff Units 1 and 2 was included in the 2008 AR RH SIP and approved in EPA's March 12, 2012, final rule (77 FR 14604). No changes are needed to EPA's determinations with respect to previously approved PM BART limitations (0.10 lb/MMBtu) included in Regulation No. 19 because these limitations have been rendered enforceable through an AO included with this SIP revision.

G. Southwest Electric Power Company Flint Creek Power Plant

SWEPCO, a subsidiary of AEP, provided a BART analysis (dated September 2013, Version 4) for the Flint Creek Power Plant. EPA used this analysis in the development of the AR RH FIP and ADEQ has made its BART determination included in this SIP based on the analysis provided by SWEPCO. This analysis is provided in Appendix E of this SIP and summarized below.

SWEPCO Flint Creek Plant Boiler No. 1 is a 558 megawatt dry bottom wall-fired boiler that commenced operation in 1978. SWEPCO Flint Creek Plant Boiler No. 1 has a maximum heat input of 6,324 MMBtu/hr. SWEPCO Flint Creek Plant Boiler No. 1 is equipped with Dry FGD with a Pulse Jet Fabric Filter (PJFF) and Activated Carbon Injection (ACI). SWEPCO Flint Creek Plant Boiler No. 1 burns low sulfur western coal as a primary fuel, but can also combust fuel oil and tire-derived fuels. Fuel oil firing is only allowed during unit startup and shutdown, during startup and shutdown of pulverizer mills, for flame stabilization when coal is frozen, for No. 2 fuel oil tank maintenance, to prevent boiler tube failure in extreme cold weather when the unit is offline for maintenance, and during malfunction. SWEPCO Flint Creek Plant Boiler No. 1 meets the BART-eligibility criteria. Also, based on results of air dispersion modeling, the SWEPCO Flint Creek Plant Boiler No. 1 contributes greater than 0.5 dv to visibility impairment in at least one Class I area. Consequently, the five BART statutory factors were considered for SWEPCO Flint Creek Plant Boiler No. 1.

1. Summary of BART Analysis for SO_2

The available SO_2 retrofit control technology options include DSI, Dry FGD, and Wet FGD. DSI, a form of FGD, has a control efficiency of forty to sixty percent and was considered technically feasible in SWEPCO's BART analysis for the SWEPCO Flint Creek Plant Boiler No. 1. A Dry FGD was also deemed a technically feasible option and has a control efficiency of sixty to ninety-five. Novel integrated deacidification (NID), a form of Dry FGD, was predicted to have an achievable ninety-two percent control efficiency on the SWEPCO Flint Creek Plant Boiler No. 1. Wet FGD was also considered a technically feasible option and has an eighty to ninety-five percent control efficiency.

a. Existing Controls in Use at the Source

At the time SWEPCO performed a BART analysis, no SO_2 controls were in place at Flint Creek

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Plant Boiler No. 1. Since that time, SWEPCO has installed an NID system to comply with SO_2 BART requirements included in the AR RH FIP. Cost-effectiveness and visibility improvement data included in SWEPCO's BART analysis are based on the 2001–2003 baseline, not current SO_2 controls in place at Flint Creek Plant Boiler No. 1.

b. Cost of Compliance

SWEPCO determined the cost effectiveness of a Wet FGD at an SO_2 rate of 0.04 lb/MMBtu (ninety-five percent control of baseline emissions) is $4,919 per ton of SO_2 removed, while cost effectiveness of a NID system at an SO_2 rate of 0.06 lb/MMBtu (ninety-two percent control of baseline emissions) is $3,845 per ton of SO_2 removed. Because technologies with higher control efficiencies were within the range considered cost-effective, the costs of DSI were not evaluated.

c. Energy and Nonair Quality Environmental Impacts

SWEPCO concluded that although Wet FGD was expected to achieve a slightly higher level of SO_2 control compared to NID technology, a negative energy or nonair quality impact associated with Wet FGD was the generation of large volumes of wastewater and solid waste/sludge that must be treated. Also, Wet FGD systems have increased power requirements and increased reagent usage over Dry FGD, as well as the potential for increased particulate and sulfuric acid mist releases.

d. Remaining Useful Life

The remaining useful life of SWEPCO Flint Creek Plant Boiler No. 1 does not impact the annualized capital costs because the useful life of the unit is anticipated to be at least as long as the capital cost recovery period.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated control technologies are included in Table 5-7 on page 5-9 of SWEPCO's 2013 BART analysis. Operation of NID at SWEPCO Flint Creek Plant Boiler No. 1 will result in up to a 0.647 dv improvement to the existing visibility impairment and Wet FGD does not add additional visibility improvement over Dry FGD because Wet FGD results in other visibility impairing emissions.

f. BART Requirements for SO_2

SWEPCO proposed that BART to control SO_2 emissions from SWEPCO Flint Creek Plant Boiler No. 1 was NID technology with an expected emissions rate of 0.06 lb/MMBtu calculated as a 30-day rolling average over each boiler operating day. ADEQ concurs with this determination.

AO LIS No. xx includes enforceable limitations and compliance dates consistent with ADEQ's BART determination.

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2. BART Requirements for PM

A BART determination for PM based on the existing ESP controls was included in the 2008 AR RH SIP and approved in EPA's March 12, 2012, final rule (77 FR 14604). This determination also approved the existing PM emissions rate of 0.10 lb/MMBtu. ADEQ proposes that no changes are needed to EPA's determination with respect to the previously approved PM BART limit included in Regulation No. 19 because this limitation has been rendered enforceable through an AO LIS No. XX included with this SIP revision.

V. Reasonable Progress Analysis for Arkansas Class I Areas

The 1999 RHR requires states to establish RPGs for each Class I area within the state. These goals must ensure reasonable progress consistent with the URP necessary to achieve natural visibility conditions by 2064 on the twenty percent worst days and no degradation on the twenty percent best days. The URP is also referred to as the "glidepath." In establishing RPGs, the RHR requires states to consider four factors: (1) cost of compliance, (2) the time necessary for compliance, (3) the energy and nonair quality environmental impacts of compliance, and (4) the remaining useful life of potentially affected sources. If a state determines that additional progress beyond what is necessary to achieve the URP is reasonable, the RHR rule states that "the State should adopt that amount of progress as its goal for the first-long-term strategy." The RHR also requires states to provide a demonstration as part of the SIP if the State determines that the URP needed to reach natural conditions is not reasonable. In its 2007 reasonable progress guidance, EPA states that the "glidepath is not a presumptive limit and states may establish an RPG that provides for greater, lesser, or equivalent visibility improvement as that described by the glidepath."[22] The guidance also instructs the states in the following manner:

> In deciding what amount of emissions reduction is appropriate in setting the RPG, you should take into account the fact that the long-term goal of no manmade impairment encompasses several planning periods. It is reasonable for you to defer reductions to later planning periods in order to maintain a consistent glidepath toward the long-term goal.[23]

In the 2008 AR RH SIP, ADEQ established a URP for Caney Creek and Upper Buffalo Wilderness Areas based on the progress needed to reach natural conditions by 2064 in each area. The 2008 AR RH SIP established RPGs based on a combination of mandated controls, including BART requirements, and demonstrated that these measures would provide for a rate of progress that improves visibility conditions on the worst days at a rate that surpasses the URP and would prevent degradation on the best days. ADEQ reasoned that no four factor analysis was required because the State determined that no additional controls were necessary to ensure reasonable

[22] Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program
[23] *Id.*

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progress toward natural visibility by 2064 beyond those controls required for sources subject to BART requirements. Therefore, the 2008 AR RH SIP did not include a four factor analysis.

In 2012, EPA issued a partial approval and a partial disapproval of the 2008 AR RH SIP. In this action, EPA approved the URP, but disapproved the RPGs. In justifying its disapproval of Arkansas's RPGs, EPA asserted that the URP does not establish a "safe harbor" for the State in setting its RPGs and that Arkansas should have performed a four factor analysis and determined whether additional progress would be reasonable.[24] This submittal addresses EPA's disapproval of the reasonable progress analysis included in the 2008 AR RH SIP by considering key pollutants that contribute to visibility impairment in Arkansas Class I areas and using the four factors to assess whether controls on sources that are not subject to BART are reasonable.

B. Identification of Key Pollutants and Source Categories That Contribute to Visibility Impairment in Arkansas Class I Areas

Included with the 2008 AR RH SIP, ADEQ provided emissions and air quality modeling performed by Central Regional Air Planning Association (CENRAP) in support of SIP development in the central states region.[25] As part of this modeling, the Particulate Source Apportionment Technology Tool (PSAT), included with CAMx Version 4.4, was used to provide source apportionment by geographic regions and major source categories for pollutants that contribute to visibility impairment at each of the Class I areas in the central states region.[26] The PSAT results demonstrate that sulfate (SO_4) from point sources is the principle driver of light extinction at both Arkansas Class I areas on the twenty percent worst days.

1. Regional Particulate Source Apportionment for Caney Creek and Upper Buffalo Wilderness Areas

Table 5 shows the modeled relative contributions to light extinction for each source category at Caney Creek and Upper Buffalo Wilderness Areas on the twenty-percent worst days in 2002. Point sources, responsible for approximately sixty percent of total light extinction at each Arkansas Class I area, are the primary contributor to light extinction on the twenty percent worst days. Area sources are the next largest contributor to light extinction at Arkansas Class I areas; however, area sources only contribute thirteen percent and sixteen percent of total light extinction at Caney Creek and Upper Buffalo Wilderness Areas, respectively. The other source categories each contribute between two percent and six percent of total light extinction at Arkansas Class I areas.

[24] Approval and Promulgation of Implementation Plans; Arkansas Regional Haze State Implementation Plan; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze: Proposed Rule (76 FR 64195)

[25] The central states region includes Texas, Oklahoma, Louisiana, Arkansas, Kansas, Missouri, Nebraska, Iowa, Minnesota; and tribal governments included in these states.

[26] August 27, 2007 CENRAP PSAT tool: W20% Projected Bext;

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Table 5 Modeled Light Extinction for the 20% Worst Days at Caney Creek and Upper Buffalo Wilderness Areas in 2002 (Mm^{-1})

	Point	Natural	On-Road	Non-Road	Area
Caney Creek	81.04	2.45	7.26	7.31	17.81
Upper Buffalo	77.8	2.39	6.62	7.72	20.46

Figure 2 and Figure 3 show the modeled relative contributions to light extinction for each species and source category at Caney Creek and Upper Buffalo Wilderness Areas on the twenty percent worst days in 2002. According to the 2002 PSAT results, SO_4 contributed approximately sixty-five percent and sixty-three percent of modeled light extinction at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2002. The point source category contributed eighty-six percent and eighty-seven percent of light extinction due to SO_4 at Caney Creek and Upper Buffalo, respectively, on the twenty percent worst days. The other source categories contribute much smaller proportions of light extinction due to SO_4. In fact, point sources of SO_4 contributed fifty-five to fifty-six percent of total light extinction at Arkansas Class I areas. By contrast, nitrate (NO_3) contributed approximately ten percent, primary organic aerosols (POA) contributed approximately eight percent, elemental carbon (EC) contributed approximately four percent, and soil contributed approximately one percent of modeled light extinction at both wilderness areas in 2002 on the twenty percent worst days. Crustal material (CM) contributed approximately three percent and five percent of modeled light extinction at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days. Relative contributions from on-road and point sources each represent approximately a third of light extinction attributed to NO_3. Area sources were the primary driver of light extinction attributed to POA, soil, and CM. Light extinction attributed to EC is primarily driven by non-road and area sources.

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Figure 2 Modeled Light Extinction for the 20% Worst Days at Caney Creek Wilderness Area in 2002

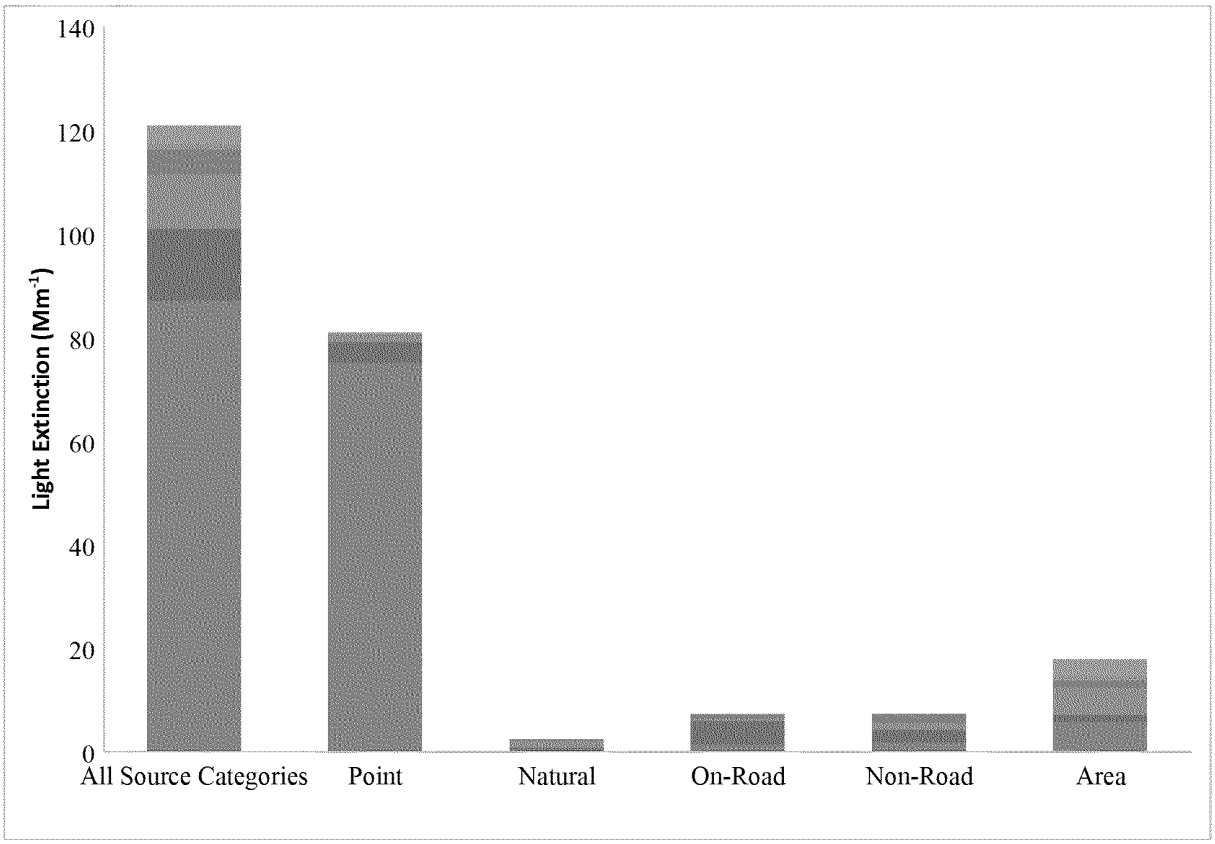

Figure 3 Modeled Light Extinction for the 20% Worst Days at Upper Buffalo Wilderness Area in 2002

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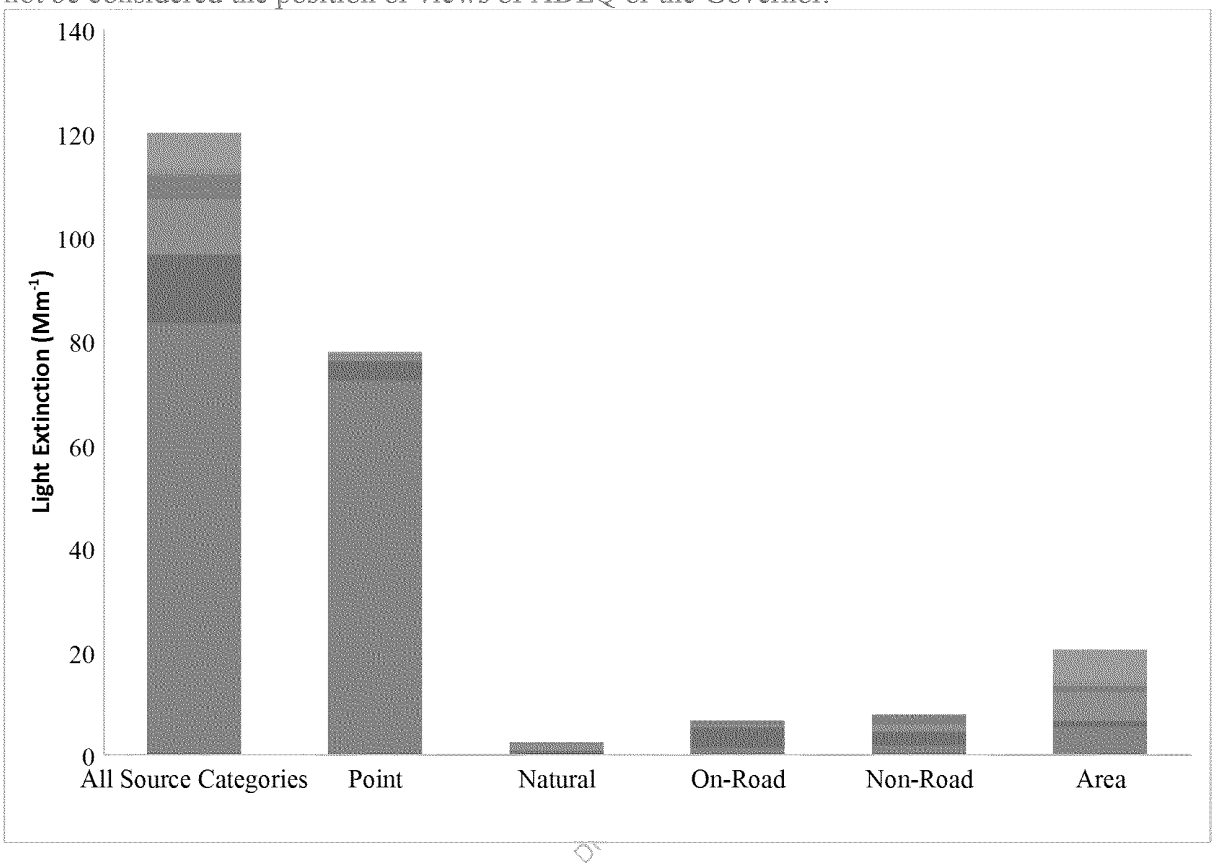

Table 6 shows the modeled relative contributions to light extinction for each source category at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2018. Point sources are projected to remain the primary contributor to light extinction at Arkansas Class I areas. Point sources are projected to contribute approximately fifty-three percent of total light extinction at Caney Creek and fifty percent of total light extinction at Upper Buffalo on the twenty percent worst days in 2018. Area sources are also projected to continue to be the second largest contributor to light extinction with contributions of twenty percent of total light extinction at Caney Creek and twenty-three percent of total light extinction at Upper Buffalo on the twenty percent worst days in 2018. Natural, on-road, and non-road sources are projected to continue to contribute a very small portion of total light extinction at Arkansas Class I areas on the twenty percent worst days in 2018.

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Table 6 Modeled Light Extinction for the 20% Worst Days at Caney Creek and Upper Buffalo Wilderness Areas in 2018 (Mm^{-1})

	Point	Natural	On-Road	Non-Road	Area
Caney Creek	45.27	2.12	1.44	3.76	16.96
Upper Buffalo	43.02	2.24	1.57	4.25	19.71

Figure 4 and Figure 5 show the modeled relative contributions to light extinction for each species and source category at Caney Creek and Upper Buffalo Wilderness Areas on the twenty percent worst days in 2018. According to the regional PSAT data, light extinction attributed to SO_4 is projected to decrease on the twenty percent worst days by forty-four percent at Caney Creek and by forty-five percent at Upper Buffalo between 2002 and 2018; however, SO_4 is projected to continue to be the primary driver of total light extinction. The 2018 projections show that point sources will continue to be the primary source of light extinction due to SO_4. Point sources of SO_4 are projected to contribute forty-three to forty-six percent of total light extinction on the twenty percent worst days in 2018 in Arkansas Class I areas. The other species are also projected to see reductions in their contribution to total light extinction; however, their relative contributions to total light extinction during 2018 remain much smaller than that of SO_4. Light extinction on the twenty percent worst days attributed to NO_3 from on-road sources is projected to decrease more rapidly than light extinction attributed to NO_3 from point sources; however, point sources of NO_3 will only contribute three to four percent of total light extinction at Arkansas Class I areas on the twenty percent worst days based on 2018 projections.

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Figure 4 Modeled Light Extinction for the 20% Worst Days at Caney Creek Wilderness Area in 2018 (Mm^{-1})

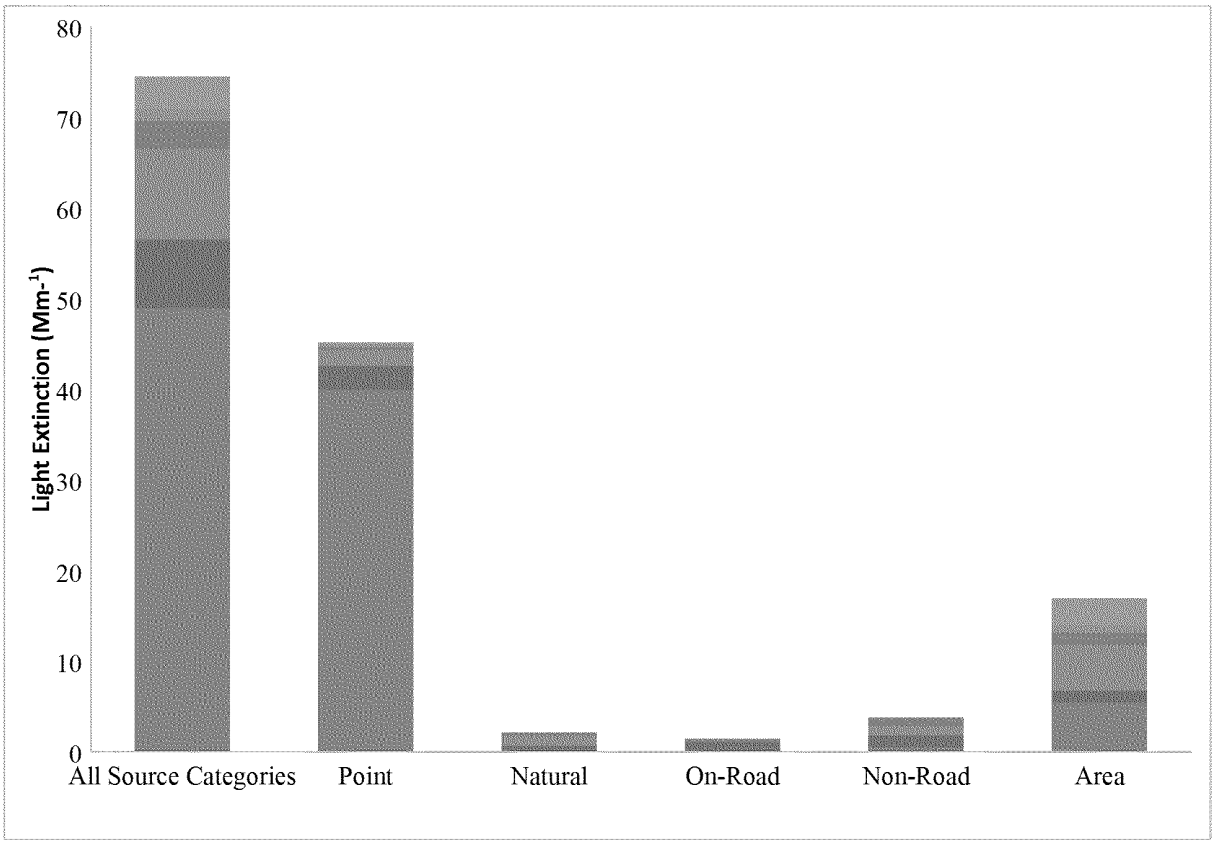

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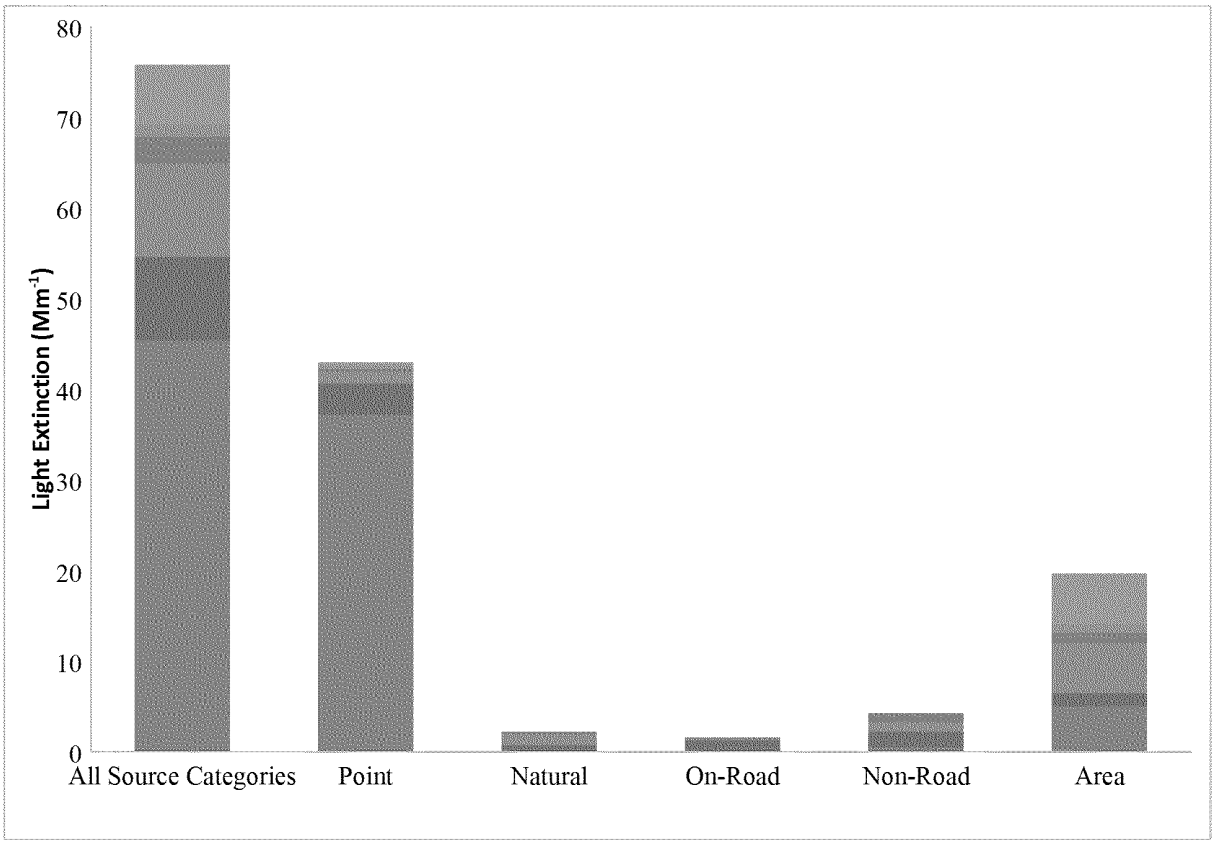
Figure 5 Modeled Light Extinction for the 20% Worst Days at Upper Buffalo Wilderness Area in 2018 (Mm^{-1})



2. Arkansas Particulate Source Apportionment for Caney Creek and Upper Buffalo Wilderness Areas

The relative contribution of sources within Arkansas to total light extinction on the twenty percent worst days at both Arkansas Class I areas is small. Species attributed to Arkansas sources contributed approximately ten percent of total light extinction on the twenty percent worst days in Arkansas Class I areas according to 2002 data and are projected to contribute between thirteen and fourteen percent of total light extinction on the twenty percent worst days in Arkansas Class I areas in 2018. Total light extinction is projected to decrease by thirty-five percent on the twenty percent worst days at Arkansas Class I areas between 2002 and 2018. Light extinction on the twenty percent worst days attributed to species from Arkansas sources is projected to decrease by seventeen percent at Caney Creek and to decrease by eleven percent at Upper Buffalo between 2002 and 2018.

Table 7 shows the relative contributions of sources within Arkansas to light extinction for each source category at Caney Creek and Upper Buffalo Wilderness Areas on the twenty percent

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worst days in 2002. Area sources had a larger impact on light extinction than did point sources when only sources within Arkansas were considered. On the twenty percent worst days in 2002, area sources contributed approximately thirty-seven percent of light extinction attributed to Arkansas sources (four percent of total light extinction) at Caney Creek and fifty percent of light extinction attributed to Arkansas sources (five percent of total light extinction) at Upper Buffalo. Point sources contributed approximately twenty-eight percent of light extinction attributed to Arkansas sources (three percent of total light extinction) at Caney Creek and twenty-four percent of light extinction attributed to Arkansas sources (two percent of total light extinction) at Upper Buffalo on the twenty percent worst days. The other sources in Arkansas contributed between seven and fourteen percent each to light extinction attributed to Arkansas sources (approximately one percent each to total light extinction) at Arkansas Class I areas on the twenty percent worst days in 2002.

Table 7 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Caney Creek and Upper Buffalo Wilderness Areas in 2002 (Mm^{-1})

	Point	Natural	On-Road	Non-Road	Area
Caney Creek	3.85	1.1	1.88	1.72	5.03
Upper Buffalo	3.25	0.94	1.29	1.26	6.72

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Figure 6 and Figure 7 show the relative contributions of sources within Arkansas to light extinction for each source category and species at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2002. SO_4 from Arkansas sources contributed approximately three percent of total modeled l extinction at Caney Creek and Upper Buffalo Wilderness Areas in 2002 on the twenty percent worst days. The point source category contributed approximately two thirds of the light extinction attributed to SO_4 from Arkansas sources at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2002. POA from Arkansas sources contributed approximately three percent and two percent of total light extinction on the twenty percent worst days at Caney Creek and Upper Buffalo Wilderness Areas, respectively. Area sources were the primary driver of light extinction due to POA. NO_3 from Arkansas sources contributed approximately two percent and one percent to light extinction at Caney Creek and Upper Buffalo Wilderness Areas on the twenty percent worst days, respectively. On-road sources accounted for approximately fifty percent of the light extinction at Arkansas Class I areas attributed to Arkansas NO_3 sources. EC from Arkansas sources contributed approximately one percent and soil from Arkansas sources contributed approximately 0.2% to total light extinction at both Arkansas Class I areas on the twenty percent worst days. Attribution to light extinction from Arkansas sources of EC was split primarily among on-road, non-road, and area sources. Light extinction from Arkansas sources of soil was primarily attributed to area sources. CM from Arkansas sources, primarily area sources, contributed approximately one and two percent of total light extinction and Caney Creek and

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Upper Buffalo Wilderness Areas, respectively.

Figure 6 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Caney Creek Wilderness Area in 2002 (Mm^{-1})

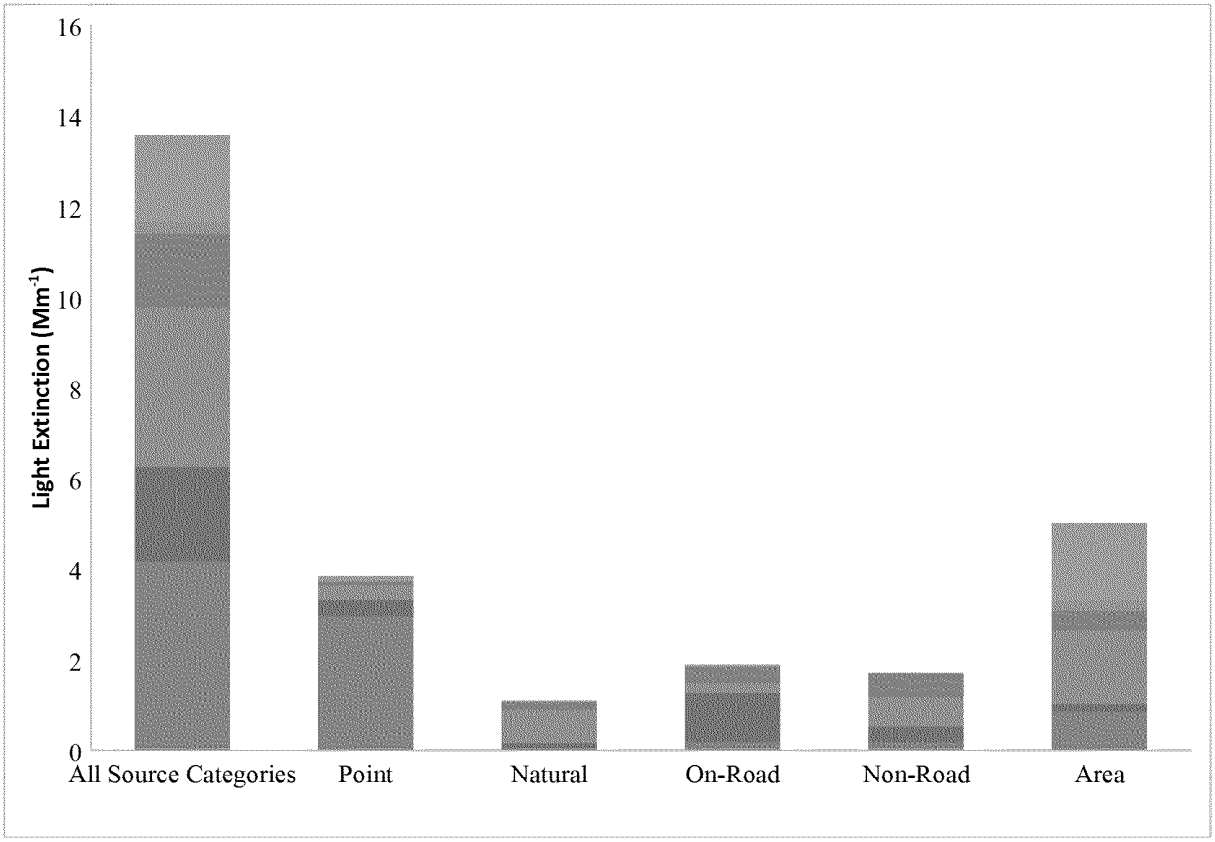

Figure 7 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Upper Buffalo Wilderness Area in 2002 (Mm^{-1})

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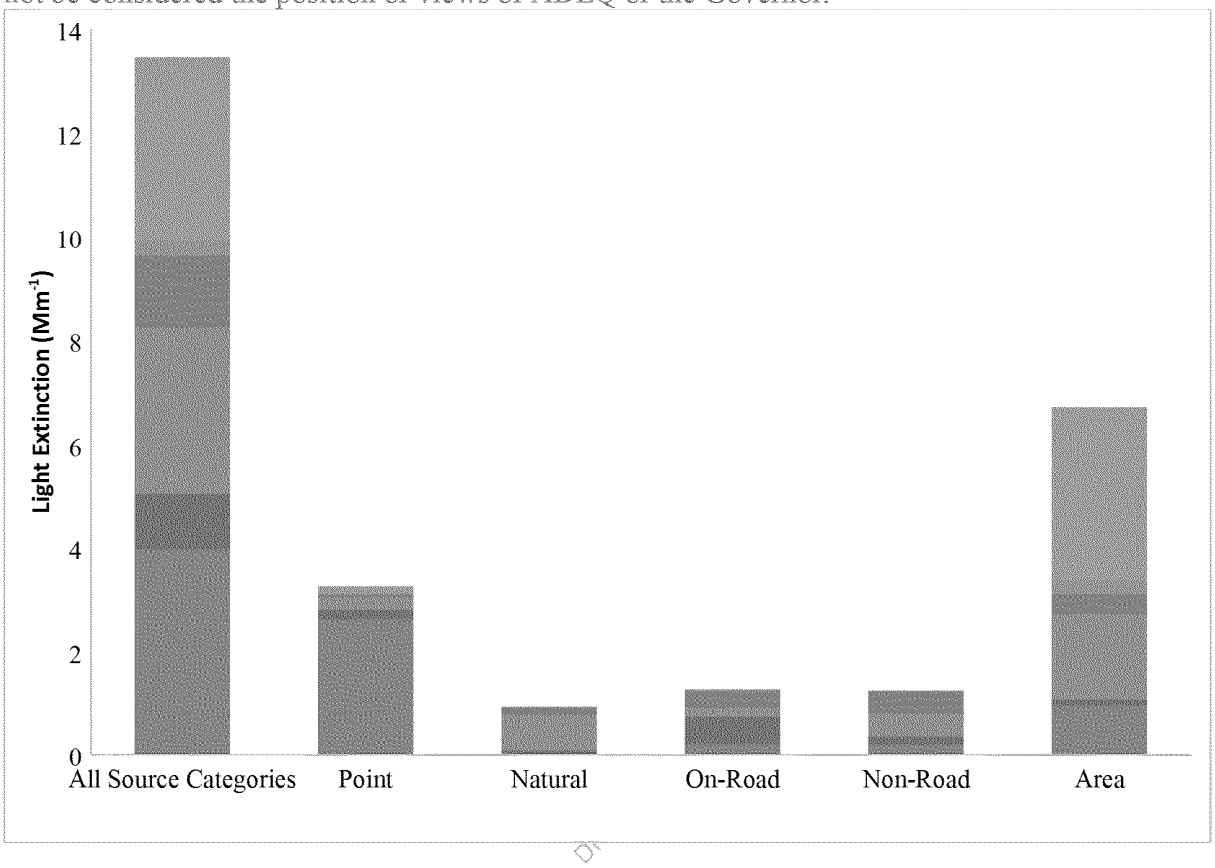

Table 8 shows the relative contributions of sources within Arkansas to light extinction for each source category at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2018. Area sources are projected to continue to have a larger impact on light extinction than do point sources when only sources located in Arkansas are considered. Area sources are projected to contribute approximately forty-three percent of light extinction attributed to Arkansas sources (six percent of total light extinction) at Caney Creek and fifty-four percent of light extinction attributed to Arkansas sources (eight percent of total light extinction) at Upper Buffalo. Point sources are projected to contribute approximately thirty-six percent of light extinction attributed to Arkansas sources (five percent of total light extinction) at Caney Creek and thirty percent of light extinction attributed to Arkansas sources (four percent of total light extinction) at Upper Buffalo. The other sources in Arkansas are projected to contribute between two percent and nine percent each to light extinction from Arkansas sources (0.3–1.2% of total light extinction) at Arkansas Class I areas on the twenty percent worst days in 2018.

Table 8 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at

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Caney Creek and Upper Buffalo Wilderness Areas in 2018 (Mm^{-1})

	Point	Natural	On-Road	Non-Road	Area
Caney Creek	4.05	1.04	0.35	0.95	4.85
Upper Buffalo	3.63	0.91	0.3	0.66	6.52

Figure 8 and Figure 9 show the relative contributions of sources within Arkansas to light extinction for each species and source category at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2018. According to the PSAT data for Arkansas sources, light extinction attributed to Arkansas NO_3 sources is projected to decrease by sixty-two percent at Caney Creek and by forty-one percent at Upper Buffalo. This projected decrease is largely due to a decrease in light extinction attributed to NO_3 from Arkansas on-road sources. Overall light extinction attributed to Arkansas sources of SO_4 are projected to decrease at Arkansas Class I areas; however, light extinction attributed to point sources of SO_4 located in Arkansas is projected to increase by four percent at Caney Creek and five percent at Upper Buffalo on the twenty percent worst days. Nevertheless, the contribution to total light extinction of SO_4 from Arkansas point sources remains relatively small—three percent of total light extinction at each Arkansas Class I area. Light extinction due to Arkansas sources of POA, EC, and CM are also projected to decrease. Light extinction due to Arkansas sources of soil is projected to increase; but, soil will remain the smallest Arkansas contributor to light extinction at both Arkansas Class I areas.

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Figure 8 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Caney Creek Wilderness Area in 2018

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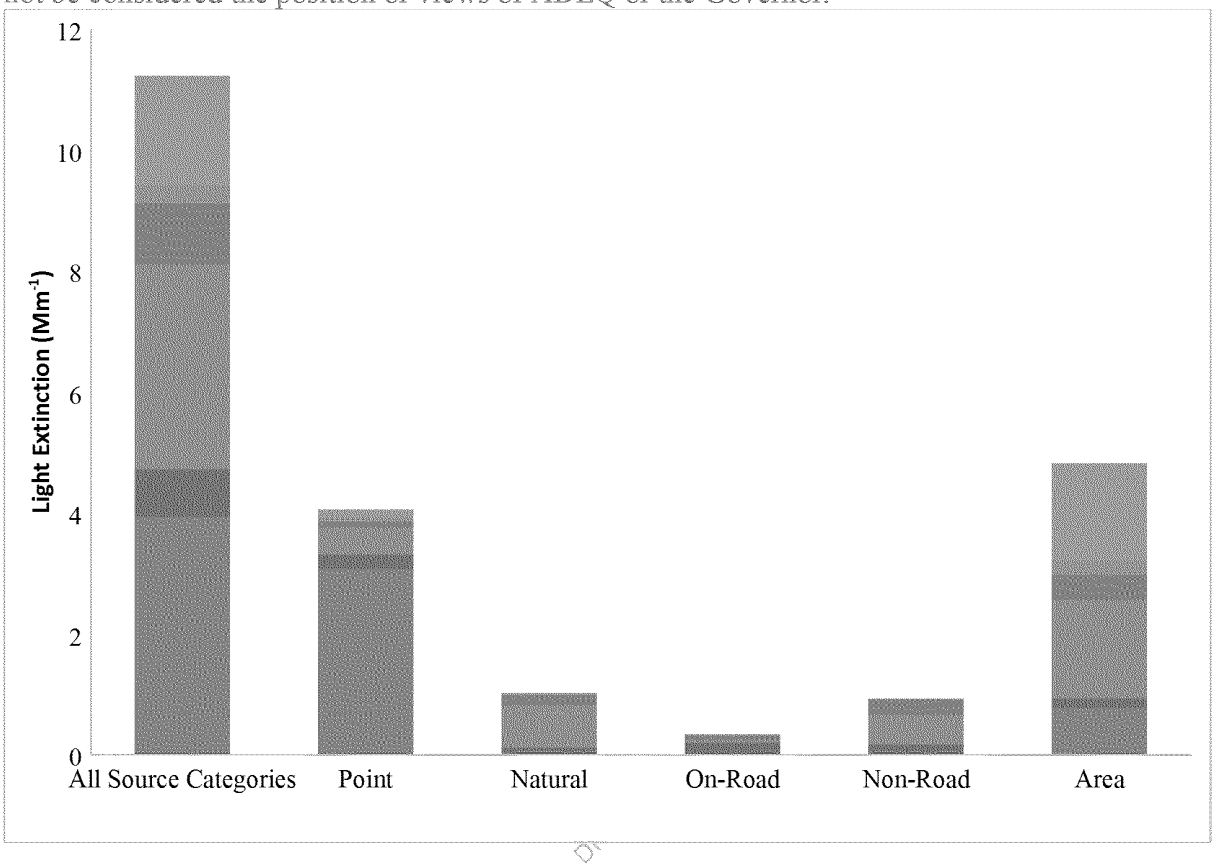

Figure 9 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Upper Buffalo Wilderness Area in 2018

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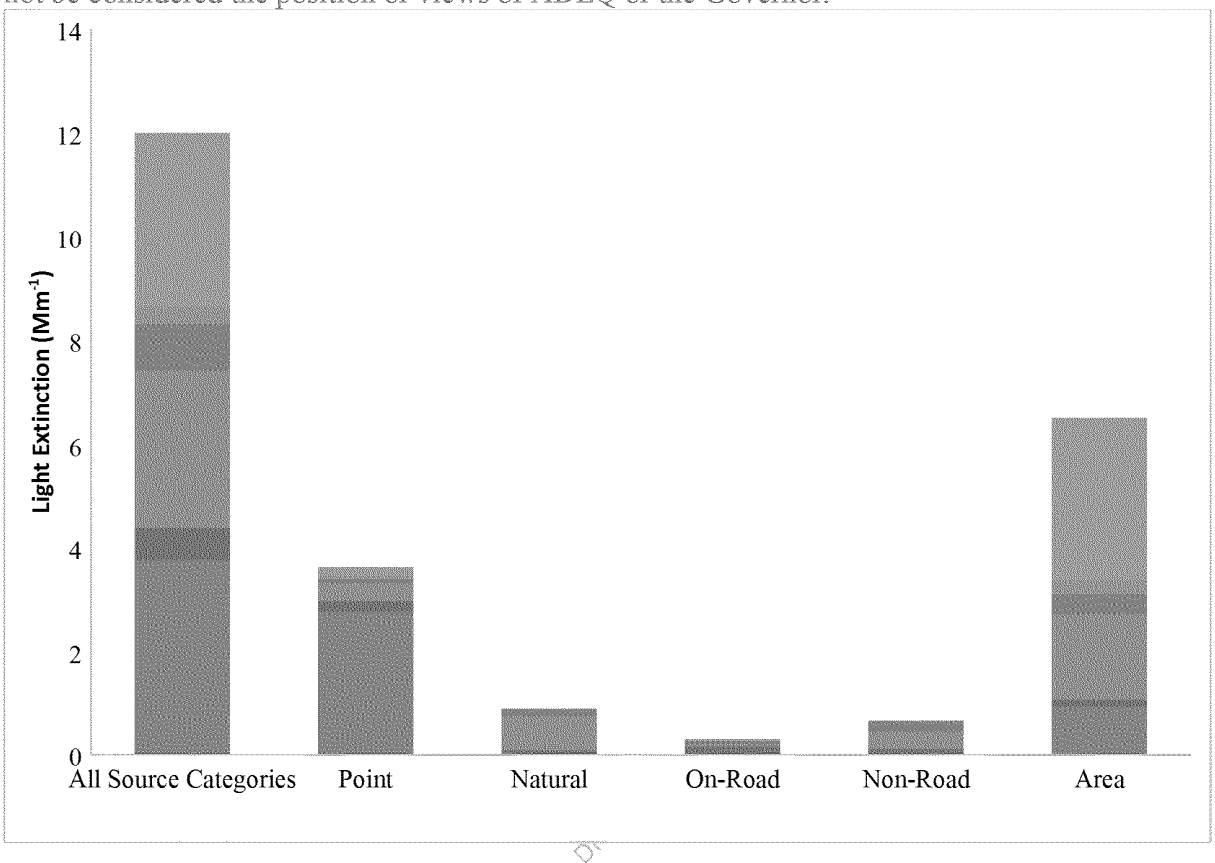

3. Summary of Key Pollutant and Source Category Findings

The region-wide PSAT data indicate that the relative contribution of SO_4 to light extinction at Arkansas Class I areas is much higher than for other pollutants on the twenty percent worst days. The majority of light extinction due to SO_4 can be attributed to point sources. The PSAT results for Arkansas sources illustrate that the relative contribution to light extinction of the various species from Arkansas sources is not as weighted toward SO_4 as the regional data set showed. Approximately a quarter of light extinction at Arkansas Class I areas resulting from sources located in Arkansas can be attributed to point sources of SO_4. Light extinction from all species associated with the point source category is smaller than for area sources when only sources located in Arkansas are considered. POA and CM are the primary species associated with area source contributions to light extinction.

After examining both region-wide PSAT data and data for Arkansas sources, ADEQ has identified SO_4 as the key species contributing to light extinction at Caney Creek and Upper Buffalo Wilderness Areas. Area sources do contribute a larger proportion of total light extinction when only sources located in Arkansas are considered; however, the cost-effectiveness for control of POA and CM species from many individual small sources is difficult to quantify. Only a small proportion of total light extinction is due to NO_3 from Arkansas sources and this

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proportion has historically been driven by onroad sources. NO_3 from Arkansas point sources contributed less than half a percent of total light extinction on the twenty percent worst days at Caney Creek and Upper Buffalo based on 2002 PSAT data and is projected to contribute even less in 2018. Attribution of light extinction to soil and EC for Caney Creek and Upper Buffalo remain in both regional and Arkansas data sets.

The primary driver of SO_4 formation is emissions of SO_2 from point sources both region-wide and in Arkansas. As such, in this SIP ADEQ evaluates sources emitting at least 250 tons per year (tpy) of SO_2. These sources will be evaluated to determine whether their emissions and proximity to Arkansas Class I areas warrant further analysis using the four statutory factors.

C. Identification of Potential Reasonable Progress Sources for the First Planning Period

As a starting point to identifying which sources to evaluate for controls in ADEQ's reasonable progress analysis, ADEQ compiled a list of all sources that emitted at least 250 tpy of sulfur dioxide as reported to the EPA Emission Inventory System (EIS) in any given year between 2002 and 2015.[27] For those sources that participate in the Acid Rain Program, ADEQ obtained 2015 sulfur dioxide emissions from the Air Markets Program Data tool.[28] ADEQ then narrowed the list of sources to eleven sources that emitted at least 250 tons per year averaged over most recent three-year period for which data is available. These sources are listed in Table 9 below.

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Table 9 Sulfur Dioxide Emissions from Sources Emitting Greater Than 250 Tons per Year

Facility	Most Recent Three-Year Period	Average Sulfur Dioxide Emissions (Tons Per Year)
Entergy White Bluff*	2014–2016	24,346
Entergy Independence	2014–2016	22,531
Flint Creek Power Plant (SWEPCO)*	2014–2016	5,350
Plum Point Energy Station Unit 1	2014–2016	2,759
FutureFuel Chemical Company	2013–2015	2,837
Domtar A.W. LLC, Ashdown Mill*	2013–2015	1,553
Evergreen Packaging-Pine Bluff	2013–2015	986
Albemarle Corporation-South Plant	2013–2015	1,382
SWEPCO- John W. Turk Jr. Power Plant	2014–2016	908
Ash Grove Cement Company/Foreman Cement Plant	2013–2015	369
Nucor-Yamato Steel Company	2013–2015	301

[27] Emissions Inventory data was obtained from the Emission Inventory System (EIS) Gateway from the following datasets 2002 National Emissions Inventory, 2005 National Emissions Inventory, 2008 National Emissions Inventory V3, 2009 Arkansas Department of Environmental Quality, 2010 Arkansas Department of Environmental Quality, 2011 National Emissions Inventory V2, 2012 Arkansas Department of Environmental Quality, 2013 Arkansas Department of Environmental Quality, 2014 National Emissions Inventory V1, and 2015 Arkansas Department of Environmental Quality.

[28] https://ampd.epa.gov/ampd/

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*Facilities are subject to BART requirements which satisfy the four factor analysis requirement for reasonable progress for these sources.

Entergy White Bluff, Flint Creek, and Domtar are all subject to BART limitations as part of this SIP. Since the BART analyses conducted to establish these control requirements are based on an assessment of many of the same factors that must be addressed in establishing the reasonable progress goals, these control requirements satisfy the reasonable progress goal-related requirements for review of these sources during this planning period. No additional emissions controls are necessary for these sources. For the other sources listed in Table 9, ADEQ calculated the total average actual emissions rate (Q) in tons of SO_2 per year over the most recent three-year period and determined the distance (D) in kilometers of each source to its closest Class I area. A Q divided by D value of ten was used as a threshold for further evaluation of reasonable progress controls. This value was selected based on guidance contained in the BART guidelines and is consistent with the approach used in other EPA rulemakings.[29] Table 10 lists the Q/D values for these sources.

Table 10 Q/D Values for Large SO_2 Point Sources[30]

Facility	Upper Buffalo	Caney Creek
Entergy Independence	**126**	**81**
Plum Point Energy Station Unit 1	9	7
FutureFuel Chemical Company	**17**	**10**
Evergreen Packaging-Pine Bluff	4	5
Albemarle Corporation-South Plant	5	9
SWEPCO- John W. Turk Jr. Power Plant	4	**11**
Ash Grove Cement Company/Foreman Cement Plant	1	5
Nucor-Yamato Steel Company	1	1

Three sources identified in Table 10 had a maximum Q/D value greater than or equal to ten: Entergy Independence, FutureFuel Chemical Company, and John W. Turk Jr. Power Plant. Entergy Independence is the second largest point source of SO_2 in Arkansas with average 2014–2016 emissions of 22,531 tpy. By contrast, FutureFuel Chemical Company averaged 2,837 tpy (2013–2015) and John W. Turk Jr. Power Plant averaged 908 tpy (2014–2016). SO_2 emissions from FutureFuel Chemical Company and John W. Turk Jr. Power Plant are approximately an order of magnitude lower than emissions from Entergy Independence. FutureFuel Chemical Company was a BART-eligible source and modeling performed in the

[29] 40 CFR part 51, app. Y, § III; Promulgation of Air Quality Implementation Plans; Arizona; Regional Haze and Interstate Visibility Transport Federal Implementation Plan; Proposed Rule (February 18, 2014)
[30] Class I Areas_Q Over D Calculations.xls

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development of the 2008 AR RH SIP demonstrated that FutureFuel Chemical Company had less than a 0.5 dv impact on Class I areas. John W. Turk Jr. Power Plant began operation in 2012 and has implemented best available control technology, which is more stringent than BART. As such, ADEQ determined that it was appropriate to defer consideration of these sources under reasonable progress to future regional haze planning periods. Deferring consideration of these two facilities is consistent with EPA's determination in the final AR RH FIP. ADEQ will focus its evaluation of the four reasonable progress factors on Entergy Independence because it is the second highest emitter of SO_2 in Arkansas, has high Q/D values, and is not subject to BART.

D. Consideration of Reasonable Progress Factors for Entergy Independence

In determining reasonable progress, Clean Air Act section 169(A)(g)(1) requires states to examine the cost of compliance, the time necessary for compliance, energy and nonair impacts, and remaining useful life. This section details our analysis of the factors on potential control strategies for SO_2 at Entergy Independence.

1. Cost of Compliance

The Entergy Independence Power Plant is a coal-fired electric generating station with two identical 900 megawatt boilers. These boilers burn Wyoming Powder River Basin sub-bituminous coal as their primary fuel and No. 2 fuel oil or bio-diesel as start-up fuel. The layout and boiler units used at this facility are similar to those used at Entergy White Bluff; however, units at Independence were installed in 1983, nine years after installation of units at Entergy White Bluff, and are not subject to BART. Because Entergy White Bluff and Entergy Independence are sister facilities, costs for different control technologies examined in the BART analysis for Entergy White Bluff should provide reasonably accurate cost estimates for Entergy Independence. This method of assessing cost of compliance for Entergy Independence is supported by documentation provided in the docket for the AR RH FIP.[31]

In the AR RH FIP, EPA evaluated Wet FGD and Dry FGD for Entergy Independence using similar cost assumptions as were used for their BART analysis for Entergy White Bluff. EPA eliminated Wet FGD during its analysis due to the minimal increase in estimated visibility improvement achieved at a much higher cost than Dry FGD. Therefore, ADEQ determined that it is reasonable to eliminate from consideration Wet FGD.

Entergy comments on the AR RH FIP and a report by engineering firm Sargent and Lundy, LLC ("S & L") demonstrate errors in EPA's cost estimates and emissions reduction calculation methodology that overestimate the cost-effectiveness of installation of Dry FGD at Entergy White Bluff.[32] In the AR RH FIP, EPA similarly overestimates cost-effectiveness of Dry FGD at Entergy Independence in its reasonable progress analysis for SO_2 controls. The analysis

[31] EIA Consolidated Data_WB and Ind_Y2012.xlsx

[32] *Review of EPA's Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan* (2015).

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contained herein evaluates the cost-effectiveness of Dry FGD at Entergy Independence as opposed to continued use of low sulfur coal for the remainder of the 2008–2018 Regional Haze planning period.

By using similar assumptions to those used in the Entergy White Bluff BART analysis for the AR RH FIP, EPA underestimates the cost of Dry FGD and overestimates the amount of SO_2 emissions reductions at Entergy Independence that can be achieved. S & L's report estimates that actual cost-effectiveness for Dry FGD at Entergy White Bluff would be $5,462 – $6,445 more expensive per ton of SO_2 reduced than EPA estimated in the AR RH FIP.[33] Given the similar layout and age of Entergy Independence to Entergy White Bluff, the margin by which EPA overestimated the cost-effectiveness of installation of Dry FGD at Entergy Independence is likely within a similar range.

In EPA's reasonable progress determination for Entergy Independence in the AR RH FIP, EPA underestimates certain costs and makes unreasonable assumptions with respect to the amortization period for Dry FGD. EPA applied the same total annualized cost of installing and operating Dry FGD developed for Entergy White Bluff to the Entergy Independence units.[34] According to S&L's report, EPA made several errors in developing Entergy White Bluff's total annualized cost which resulted in an underestimation of the total cost of Dry FGD at Entergy White Bluff by approximately $200 million.[35] Furthermore, EPA assumes an unreasonable amortization period for the cost of Dry FGD at Entergy Independence. EPA's amortization period is based on the equipment life of the Dry FGD scrubbers, but does not take into account the remaining useful life of Entergy Independence Units 1 and 2. As described further in the remaining useful life factor section of this four-factor analysis, the amortization period used in EPA's FIP extends twenty-eight years beyond the book life of Entergy Independence Units 1 and 2. Although coal-fired electric generating units may operate longer than the typical book life for such units, it is not reasonable to anticipate that they will be operating twenty-eight years longer. Taken together, EPA's cost and amortization period assumptions artificially improve the cost-effectiveness of installation of Dry FGD at Entergy Independence.

In the AR RH FIP, EPA also erred in its determination of baseline emissions and the amount of SO_2 that would be reduced from installation of Dry FGD at Entergy Independence resulting in artificially lower cost-effectiveness values. EPA calculated the baseline by taking the average annual SO_2 emissions for 2009–2013 and excluded the minimum and maximum years.[36] EPA

Prepared by Sargent & Lundy for Entergy Arkansas, Inc., Docket No. EPA-R06-OAR-2015-0189.

[33] *Review of EPA's Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan* (2015). Prepared by Sargent & Lundy for Entergy Arkansas, Inc., Docket No. EPA-R06-OAR-2015-0189.

[34] EPA (2015). *Technical Support Document for the SDA Control Cost Analysis for the Entergy White Bluff and Independence Facilities Arkansas Regional Haze Federal Implementation Plan (SO_2 Cost TSD).* Docket No. EPA-R06-OAR-2015-0189.

[35] *Review of EPA's Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan* (2015). Prepared by Sargent & Lundy for Entergy Arkansas, Inc., Docket No. EPA-R06-OAR-2015-0189.

[36] *Promulgation of Air Quality Implementation Plans; State of Arkansas; Regional Haze and Interstate Visibility*

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also assumed a controlled emissions rate of 0.06 lb/MMBTU based on a vendor guarantee that does not reflect controlled emissions rates achieved on a long-term basis or impacts from variation in operating parameters according to the S & L report.[37] S & L provides a list of permit limitations based on projects using similar technology to the Dry FGD mandated for Entergy Independence in the AR RH FIP. The median SO_2 permit limitation was 0.10 lb/MMBtu.[38] By assuming a lower controlled emissions rate than is achievable, EPA artificially inflated the amount of SO_2 emissions that it estimates would be reduced. Overestimation of the amount of SO_2 that can be reduced makes a control technology appear more cost-effective. Furthermore, Entergy Independence has seen a decrease in dispatch due to market conditions for coal and natural gas that is expected to continue during this planning period. This decrease in dispatch has resulted in a reduction in annual SO_2 emissions. As a result, installation and use of Dry FGD will not result in the level of emissions reductions assumed by EPA in their cost-effectiveness calculations.

The combination of underestimation in cost of installation and operation of Dry FGD and the overestimation of SO_2 emissions reductions likely to be achieved from operation of Dry FGD at Entergy Independence Units 1 and 2 results in unrealistic cost-effectiveness values used to justify that the requirement to meet an emissions rate based on Dry FGD in the AR RH FIP. In comments on the AR RH FIP, Entergy asserts that the cost-effectiveness of Dry FGD, assuming that the costs at Entergy Independence match the cost of installation and operation at Entergy White Bluff, would be $4,234/ton of SO_2 removed at Entergy Independence Unit 1 and $3,909 per ton of SO_2 removed at Entergy Independence Unit 2.[39] Based on Entergy's assessment, EPA artificially lowered the cost-effectiveness by $1,757 at Entergy Independence Unit 1 and by $1,623 at Unit 2. Given the likelihood of a continued decrease in dispatch at Entergy Independence that was not factored into EPA's calculations for the AR RH FIP and Entergy's calculations in their comments on the AR RH FIP, it is likely that Dry FGD will be even less cost-effective at Entergy Independence than EPA's or Entergy's estimates.

Furthermore, ADEQ finds that dry FGD not cost effective when considering the cost-per-deciview of visibility improvement. The cost-per-deciview is orders of magnitude greater than the cost per ton of pollutant removed. S & L estimates that cost-per-deciview is approximately $1.33 billion per deciview improvement at Caney Creek and $1.53 billion per deciview improvement at Upper Buffalo.[40] ADEQ finds that Dry FGD is not cost effective when independently considering either the cost-per-ton of pollutant removed or the cost-per-deciview

Transport Federal Implementation Plan; Final Rule (2016). 81 FR 66332.

[37] *Review of EPA-s Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan* (2015). Prepared by Sargent & Lundy for Entergy Arkansas, Inc.

[38] Id.

[39] Entergy Arkansas Inc. (2015). *Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas*. Docket ID No. EPA-R06-OAR-2015-0189

[40] Entergy Arkansas Inc. (2015).Appendix A to *Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas* at p. 21. Docket ID No. EPA-R06-OAR-2015-0189

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improvement of Dry FGD.

2. Existing controls

Emissions of SO_2 from Entergy Independence units are currently controlled by the use of low sulfur coal. The new source performance standard for sulfur dioxide is 1.2 lb/MMBtu; however, a more stringent prevention of significant deterioration (PSD) emissions limitation of 0.93 lb/MMBtu is in effect for these units. Using low sulfur coal, Entergy Independence has been able to achieve monthly average emissions rates in the range of 0.39–0.63 lb SO_2/MMBtu.[41] The average monthly emissions rate between 2009 and 2015 was 0.54 lb SO_2/MMBtu at each unit. Thus, Entergy Independence has achieved lower emissions rates than required by permit through existing controls.

Entergy Independence Units 1 and 2 are currently permitted to emit 35,438.6 tons per year (tpy) of SO_2 (8,091.0 lb SO_2/hr) each or 70,877.2 tpy of SO_2 (16,182 lb SO_2/hr) combined.[42] Annual emissions for Entergy Independence Units 1 and 2 combined from 2008–2014 ranged from 26,448–32,974 tpy SO_2—less than half of total allowable emissions in their permit.[43] Annual emissions from Entergy Independence dropped to 14,994 tpy SO_2 in 2015.[44] Annual emissions from Entergy Independence increased to 22,569 SO_2 in 2016, but are lower than any annual emissions rate from 2008–2014.[45] Market trends for coal and natural gas have resulted in decreased dispatch of Entergy Independence and consequently reduced emissions of SO_2. According to data from the Energy Information Administration, the economic pressure on coal units due to low natural gas prices is expected to continue throughout the rest of the 2008–2018 planning period and beyond.[46] Figure 10 shows energy consumption trends from the electricity sector by fuel from 1980–2016 and projects trends out to 2040. As a result of current controls and decreased dispatch, installation of Dry FGD at Entergy Independence would remove less SO_2 than assumed in EPA's reasonable progress analysis contained in the AR RH FIP. SO_2 concentration also influences the performance of Dry FGD, with reduced removal efficiency at

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[41] Air Markets Program Data: Monthly Heat Input and SO_2 Data for Entergy Independence for 2009 – 2016 <https://ampd.epa.gov/ampd/>
[42] Entergy Arkansas, Inc. – Independence, Permit No. 0449-AOP-R10 AFIN: 32-00042
[43] 2009 Arkansas Department of Environmental Quality Emissions Inventory, 2010 Arkansas Department of Environmental Quality Emissions Inventory, 2011 National Emissions Inventory Version 2, 2012 Arkansas Department of Environmental Quality Emissions Inventory, 2013 Arkansas Department of Environmental Quality Emissions Inventory, 2014 National Emissions Inventory Version 1 <https://eis.epa.gov/eis-system-web>
[44] Air Markets Program Data: Air Markets Program Data: Annual SO_2 Data for Entergy Independence for 2015 <https://ampd.epa.gov/ampd/>
[45] Air Markets Program Data: Air Markets Program Data: Quarterly SO_2 Data for Entergy Independence for 2015 and 2016 <https://ampd.epa.gov/ampd/>
[46] *Annual Energy Outlook 2017.* U.S. Energy Information Administration

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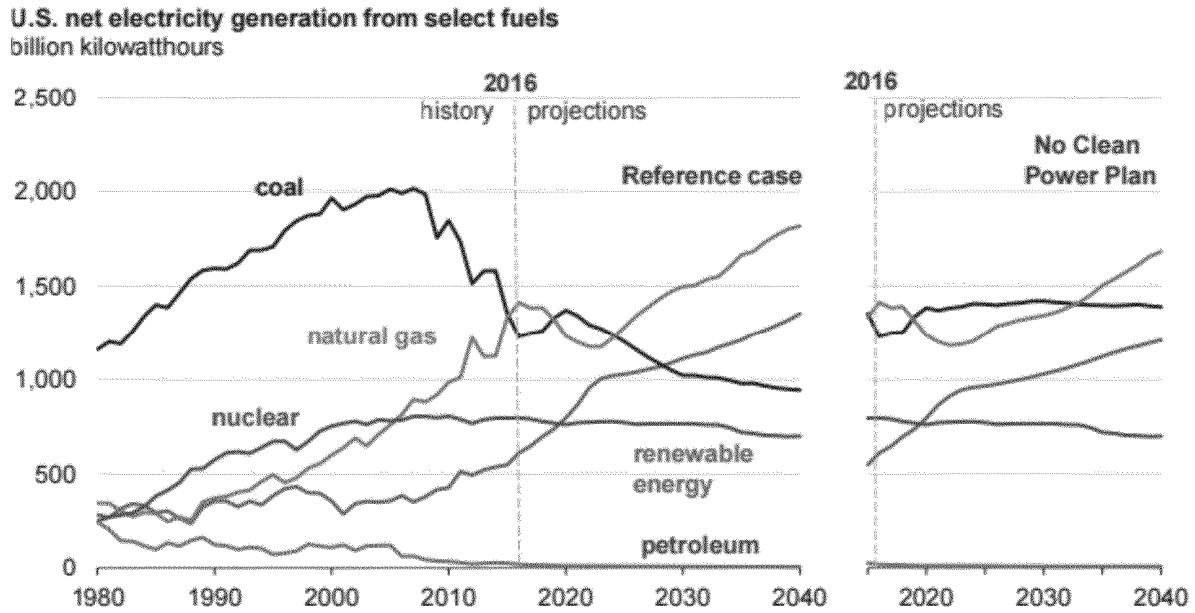
lower concentrations of SO_2.[47]

Figure 10 United States Electricity Sector Energy Consumption by Fuel[48]



3. Time Necessary for Compliance

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In the AR RH FIP, EPA required that Entergy Independence comply with an emissions rate based on the installation and operation of dry FGD on Units 1 and 2 by 2021. This compliance date was based on EPA's assumption that five years would be sufficient time for Entergy Independence to install and operate Dry FGD; however, this five-year compliance window falls outside of the first planning period (2008–2018) for which the FIP was promulgated. There is not sufficient time to install Dry FGD at Entergy Independence before the conclusion of the first planning period that EPA's AR RH FIP and this replacement SIP cover. Therefore, it is reasonable to rely upon only controls that can be implemented during the 2008–2018 planning period for determining RPGs. As such, Arkansas concludes that continued operation of existing controls in place for Entergy Independence are reasonable given the time remaining in this planning period.

4. Energy and Nonair Quality Environmental Impacts of Compliance

Dry FGD utilizes lime slurry to remove SO_2 from flue gas. In the process, particulate matter is

[47] Schnelle, K and Brown, C. (2002). *Air Pollution Control Technology Handbook*. Kreith, F., Ed. at 18.2.3 <http://dlia.ir/Scientific/e_book/Technology/Environmental_Tech_Sanitary_Engine/TD_878_894_Special_Types_of_Environment_/020751.pdf>

[48] U.S. Energy Information Administration. (2017). Annual Energy Outlook 2017 at70. <http://www.eia.gov/outlooks/aeo/pdf/0383(2017).pdf>

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generated that must be controlled through use of a baghouse or electrostatic precipitator. Once collected, the waste material is disposed of through landfilling. Costs associated with control of particulate matter and additional power requirements were factored into the cost estimates calculated by Entergy and EPA. Entergy has not indicated unusual circumstances that would create greater problems than experienced elsewhere that Dry FGD was utilized as BART.

5. Remaining Useful Life

In the AR RH FIP, EPA erred by not taking into consideration the remaining useful life of Entergy Independence Units 1 and 2. Instead, EPA used the estimated life of Dry FGD scrubbers (thirty years) for amortization rather than the remaining useful life of the Entergy Independence units. EPA asserts that the thirty-year equipment life for scrubbers is appropriate because no enforceable shut-down date has been set for Entergy Independence Units 1 and 2. This method of amortization is misleading given that EPA's typical modeling assumptions use a forty-year book life for coal-fired power plants and a fifteen-year schedule for financing environmental retrofits.[49] Entergy Independence Unit 1 was installed in 1983 and Unit 2 was installed in 1984. Units 1 and 2 will reach their fortieth year in 2023 and 2024, respectively; therefore, an assumption of a thirty-year amortization period starting in 2021—as was proposed in the AR RH FIP—does not reasonably take into account the remaining useful life of the units. Coal-fired power plants may continue to operate beyond the forty-year book life assumption; but, it is unlikely that these units would operate twenty-eight additional years beyond their book life.

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6. Degree of Improvement in Visibility

Although the degree of visibility improvement is not one of the four statutory factors for a reasonable progress analysis, the ultimate goal of any reasonable progress controls should be achieving visibility improvements. Imposition of controls that would not result in tangible visibility benefits during the planning period that a SIP (or FIP) addresses is not reasonable. In comments on the proposed AR RH FIP, Entergy points out that only a small fraction of the visibility improvement that EPA estimates would result from the installation and operation of all controls in the proposed FIP could be ascribed to Entergy Independence.[50] Entergy estimates that installation of Dry FGD at Independence would only result in a 0.08 dv improvement at Caney Creek and a 0.07 dv improvement at Upper Buffalo on the twenty percent worst days.[51] A value of one dv is considered perceptible. Furthermore, the cost per deciview based on those estimates would be approximately $1.33 billion per deciview improvement at Caney Creek and $1.53

[49] Chapter 8: Financial Assumptions. (2013). In *Documentation for Base Case v. 5.13*. (pp. 8-14 – 8-15). Retrieved November, 2016, from https://www.epa.gov/airmarkets/documentation-base-case-v513-financial-assumptions at 8-14 – 8-15.

[50] Entergy Arkansas Inc. (2015). *Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas*. Docket ID No. EPA-R06-OAR-2015-0189

[51] Entergy Arkansas Inc. (2015). *Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas*. Docket ID No. EPA-R06-OAR-2015-0189

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billion per deciview improvement at Upper Buffalo.[52]

E. Additional Controls Necessary for Reasonable Progress at Arkansas Class I Areas

Based on this analysis, ADEQ has determined that no additional controls for SO_2 or PM beyond BART are necessary for reasonable progress during the 2008–2018 planning period. The Arkansas NOx Regional Haze SIP submitted to EPA required compliance with the CSAPR trading program for ozone season NOx for all Arkansas EGUs participating in that program to address control of NOx for reasonable progress. The alternative to BART scenario for Domtar Ashdown Mill provides for greater progress than the unit-specific BART determinations for that facility.

Through an evaluation of emissions and distance from wilderness areas, ADEQ determined that only Entergy Independence need be considered in a four factor analysis; however, ADEQ's analysis demonstrates that installation of Dry FGD, as was finalized in the AR RH FIP, is neither reasonable nor necessary to achieve reasonable progress for the 2008–2018 planning period. Both Entergy's and EPA's cost-effectiveness estimates for Dry FGD at Entergy Independence exceed screening thresholds used for cost-effectiveness in other approved reasonable progress analyses.[53] As such, Arkansas has determined that the cost per ton of SO_2 reduced by installation and operation of Dry FGD is not reasonable for the 2008–2018 planning period. Entergy Independence's actual emissions are much lower than permitted and emissions from Entergy Independence are expected to continue to remain below permitted limitations due to economic dispatch throughout the remainder of the current regional haze planning period. It is not reasonable to require installation of costly controls during the 2008–2018 planning period based on the assumption that Entergy Independence will run at a greater capacity than is economically realistic. Furthermore, the time necessary for installing and operating Dry FGD at Entergy Independence would extend beyond the period covered by the AR RH FIP and this SIP. Most importantly the high cost to achieve visibility improvements that are greater than an order of magnitude lower than perceptible on the twenty percent worst days is not reasonable.

F. Reasonable Progress Goals for Arkansas Class I Areas

ADEQ is revising the RPGs established in the 2008 AR RH SIP for the twenty percent worst days at Caney Creek and Upper Buffalo Wilderness Areas to reflect control measures included in this SIP revision and the revision proposed in July 2017 that are required to be in effect by the end of the first planning period. In order to provide RPGs that account for emissions reductions from SIP controls, we have used a method similar to that used by EPA for the AR RH FIP. This

[52] Id.

[53] *Approval and Promulgation of Air Quality Implementation Plans; Common Wealth of Kentucky; Regional Haze State Implementation Plan: Proposed Rule* (2011). 76 FR 78194

EPA approved RPGs in Kentucky SIP based on CAIR, which had a \$2000/ton SO_2 cost-effectiveness screening threshold.

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method is based on a scaling of light extinction components in proportion to emissions changes anticipated from SIP controls for which compliance is required on or before December 31, 2018. ADEQ is not revising its goal of no degradation on the twenty percent best days included in the 2008 AR RH SIP.

Using the same formulas EPA used to develop its RPGs for the AR RH FIP, ADEQ scaled CENRAP's CAMx 2018 projection of light extinction components for SO_4 and NO_3 in proportion to the SIP revision's emissions reductions for SO_2 and NOx, respectively. ADEQ made updates to reflect the most recent three years of data for emissions and heat input for Arkansas EGUs and Domtar Ashdown Mill. The most recent three years of data (2014–2016) were used as opposed to EPA's method of using the five most recent years of data minus the minimum and maximum values (2009–2013) to ensure that recent changes in dispatch of Arkansas EGUs were captured.[54] The results of our analysis for the twenty percent worst days for 2018 for Caney Creek and Upper Buffalo are included in Table 11.[55]

Table 11 Reasonable Progress Goals for 2018 for Caney Creek and Upper Buffalo

Class I Area	2018 RPG 20% Worst Days (dv)
Caney Creek	22.47
Upper Buffalo	22.51

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Figure 11 and Figure 12 demonstrate that Arkansas is already achieving greater visibility improvements than the RPGs listed in Table 11.

Figure 11 Caney Creek Reasonable Progress Assessment – 20% Worst Days

[54] EIA projections show decreased consumption of coal by electric generating units that is expected to continue through 2040. Therefore, ADEQ anticipates that the coal EGU dispatch trends seen in the most recent three years is likely to continue through the first regional haze planning period and the next two planning periods. See Figure 10

[55] See RPG Calculation Data Sheet provided at https://www.adeq.state.ar.us/air/planning/sip/regional-haze.aspx.

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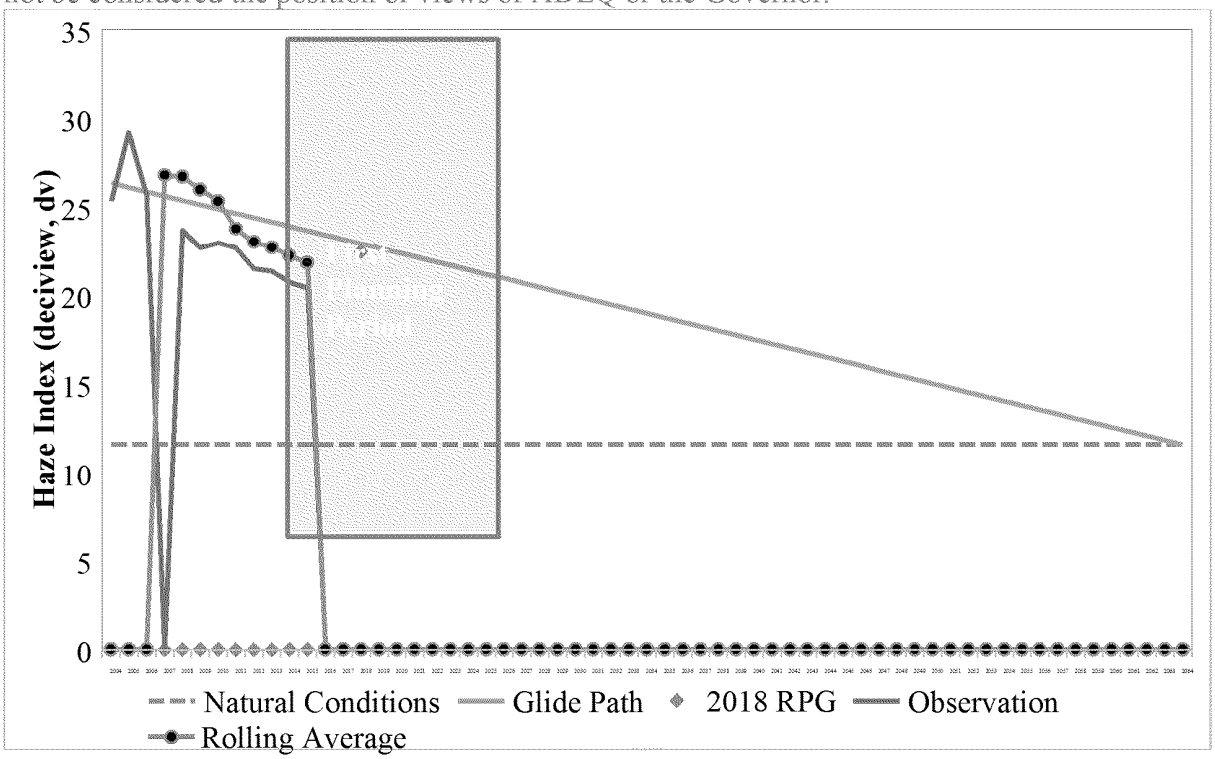

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Figure 12 Upper Buffalo Reasonable Progress Assessment – 20% Worst Days

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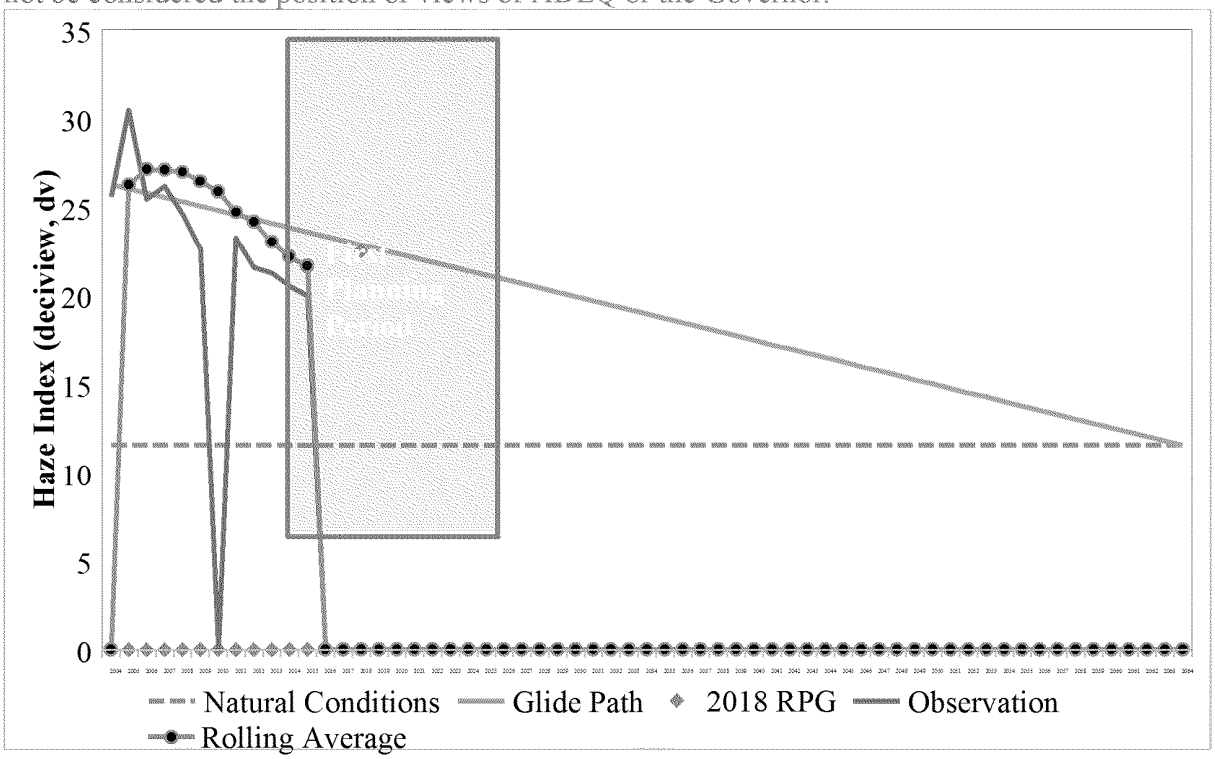

G. Interstate Visibility Transport

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Sources in Arkansas impact two Class I areas in Missouri: Hercules Glade Wilderness Area and Mingo Wilderness Area. CENRAP PSAT data indicates that Arkansas sources contributed approximately seven percent of light extinction at Hercules Glades Wilderness Area and four percent of light extinction at Mingo Wilderness Area. The impact of Arkansas sources are projected to increase between 2002 and 2018 to approximately nine percent of total light extinction at Hercules Glades Wilderness Area and five percent at Mingo Wilderness area based on the CENRAP PSAT data.

Figure 13 and Figure 14 demonstrate that Missouri is on track to achieve its visibility goals. In Missouri's 2009 Regional Haze SIP, Missouri established 2018 reasonable progress goals of 23.71 dv for Mingo Wilderness Area and 23.06 for Hercules Glades Wilderness Area. The most recent calculations for the twenty percent haziest days and twenty percent best days for Class I areas were performed for 2015.[56] For both Mingo Wilderness Area and Hercules Glades Wilderness Area, visibility impairment on the twenty percent haziest days in 2015 beat Missouri's 2018 RPGs for both Class I areas. The most recent five-year rolling average of

[56] http://vista.cira.colostate.edu/DataWarehouse/IMPROVE/Data/SummaryData/RHR_2015/SIA_group_means_7_16.csv

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observed visibility impairment on the twenty percent haziest days at Hercules Glades Wilderness Area beat Missouri's 2018 RPG for that Class I area and the most recent five year-rolling average of observed visibility impairment on the twenty percent haziest days at Mingo Wilderness Area is on track to beat Missouri's RPG for that Class I area. The visibility progress observed indicates that sources in Arkansas are not interfering with the achievement of Missouri's RPGs for Hercules Glades and Mingo Wilderness Areas. Therefore, no additional controls on sources within Arkansas are necessary to ensure that other states' visibility goals for their Class I areas are met. The control measures contained in the 2008 AR RH SIP, the NOx Regional Haze SIP revision, and this SIP revision satisfy the interstate transport visibility requirement of CAA 110(a)(2)(D)(i)(II) for the 2008 eight-hour ozone and 2012 annual $PM_{2.5}$ NAAQS.

Figure 13 Hercules Glades Reasonable Progress Assessment – 20% Worst Days

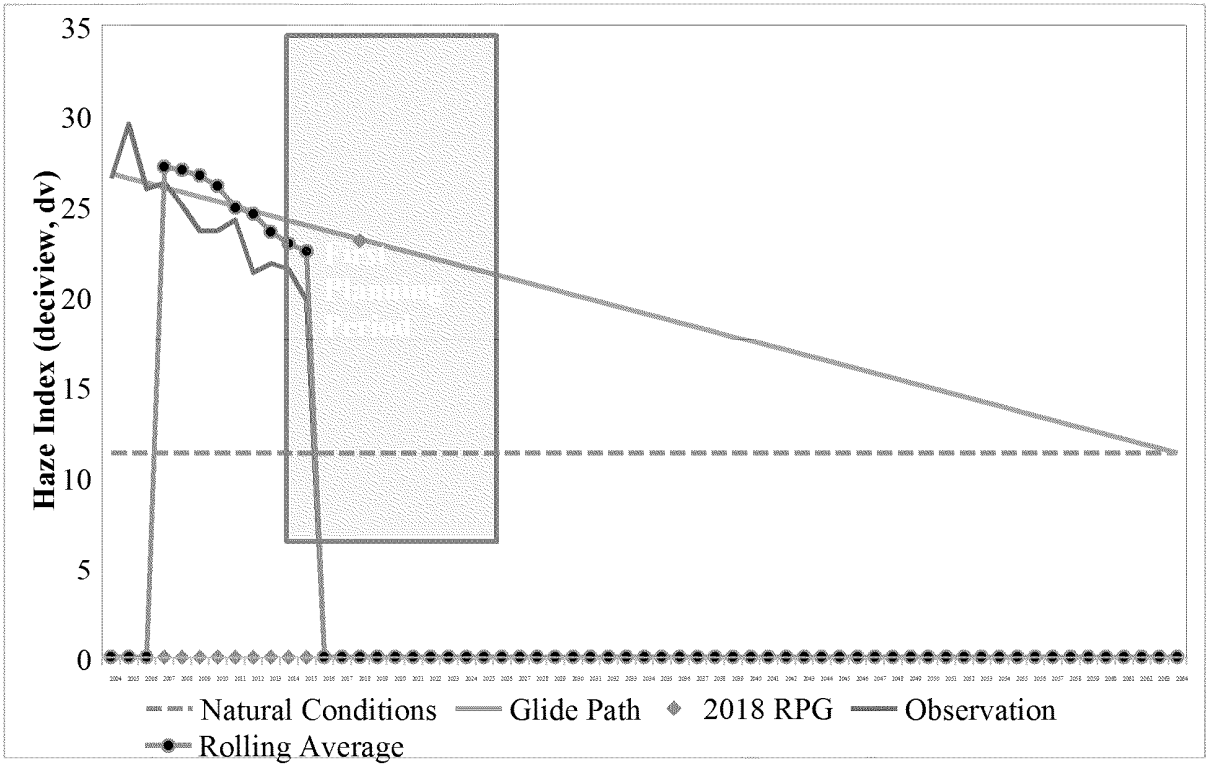

Figure 14 Mingo Reasonable Progress Assessment – 20% Worst Days

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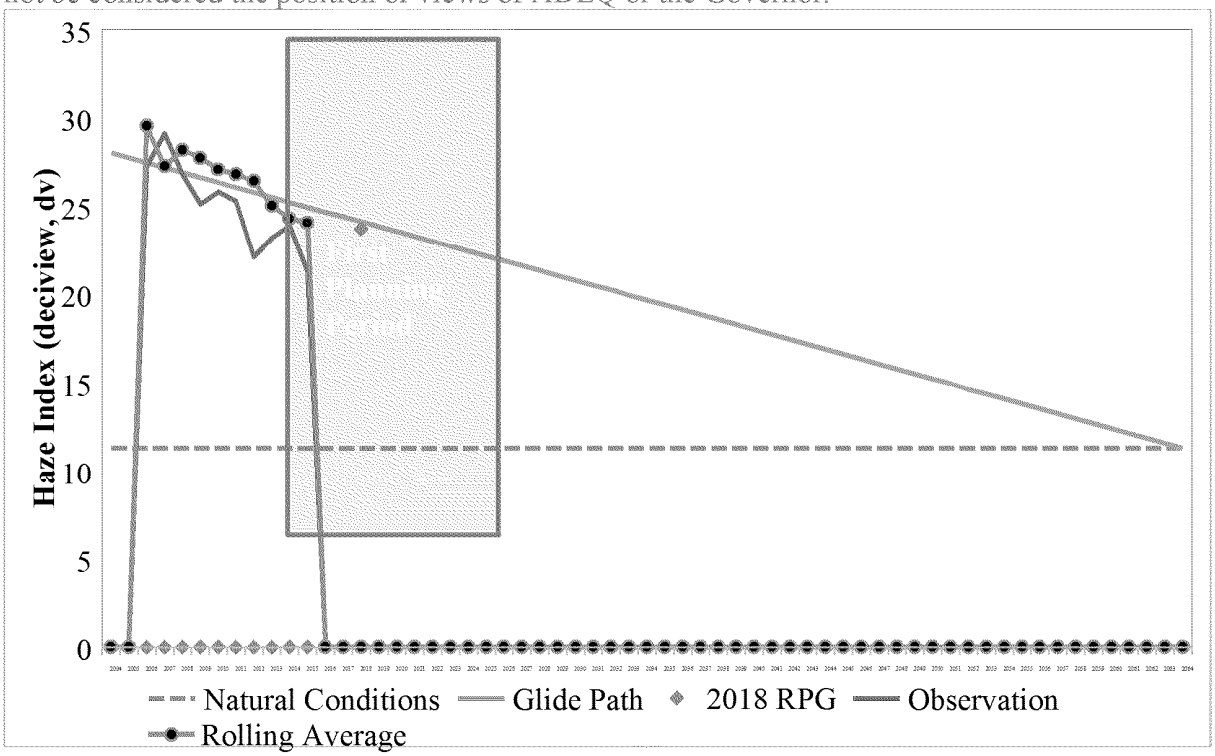

VI. Long-Term Strategy

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In 2012, EPA partially approved and partially disapproved Arkansas's long-term strategy included in the 2008 AR RH SIP. 40 CFR 51.308(d)(3)(v) requires the consideration of the following factors in developing a long-term strategy: (1) Emissions reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment; (2) measures to mitigate the impacts of construction activities; (3) emissions limitations and schedules for compliance to achieve the reasonable progress goal; (4) source retirement and replacement schedules; (5) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the state for these purposes (6) enforceability of emissions limitations and control measures; and (7) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the long-term strategy. Because EPA disapproved some of ADEQ's BART determinations and RPGs, EPA disapproved the emissions limitations and schedules of compliance element of the long-term strategy included in the 2008 AR RH SIP. EPA approved the other six elements of the long-term strategy.

Because the ongoing air pollution programs element of the Arkansas long-term strategy was previously approved, ADEQ is not proposing changes to that element in this SIP revision. Nevertheless, ADEQ notes that the landscape of ongoing air pollution programs has changed since EPA approved that element of the long-term strategy in the 2008 AR RH SIP. These

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changes include more stringent vehicle emission standards, renewable fuel standards, fuel efficiency standards, marine and aircraft standards, mercury and air toxics standards, various national emission standards for hazardous air pollution, and a replacement for the clean air interstate rule in the form of CSAPR. These additional air pollution programs are anticipated to achieve even greater emissions reductions that may result in further visibility improvement than the programs described in the 2008 AR RH SIP. A partial list of ongoing air pollution programs that have been implemented since the 2008 AR RH SIP is provided below:

- Tier 3 Vehicle Emissions and Fuel Standards Program (light duty, medium duty, and some heavy duty) (79 FR 23414, 2014)
- 2017 and Later Model Year CAFÉ Standards (77 FR 62624, 2012)
- Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017 (80 FR 77420, 2015)
- Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy Duty Engines and Vehicles (76 FR 57106)
- Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2 (81 FR 73478, 2016)
- Ocean-going vessels category 3 marine rule (2010), NOx standards for Aircraft (2012)
- Small Nonroad Engine and Marine Spark-Ignition Engines and Vessels Emission Standards Phase 3 (2008)
- New NAAQS standards: 2006 $PM_{2.5}$, 2008 Ozone, 2010 NO_2, 2010 SO_2, 2012 $PM_{2.5}$
- Mercury and Air Toxics Standards
- CSAPR and CSAPR update
- NESHAP for Primary Aluminum Reduction Plants (80 FR 62390, 2015)
- NESHAP for Secondary Aluminum Production (80 FR 56700, 2015)
- NESHAP for Phosphoric acid manufacturing and phosphate fertilizer production (80 FR 50386, 2015)
- NESHAP for Mineral Wool Production and Wool Fiberglass manufacturing (80 FR 45280, 2015)
- NESHAP for Ferroalloys Production (80 FR 37366, 2015)
- NESHAP for Off-site waste and recovery operations (80 FR 14248, 2015)
- NSPS update for New Residential Wood Heaters, New Residential Hydronic Heaters, and Forced-Air Furnaces (80 FR 13672, 2015)
- NSPS update for Kraft Pulp Mills (79 FR 18952, 2014)
- NESHAP for Group IV Polymers and Resins; Pesticide Active Ingredient Production; and Polyether Polyols production (79 FR 17340, 2014)
- NESHAP and NSPS for Portland cement Manufacturing Industry (78 FR 10006, 2013)
- NESHAP for Hard and Decorative Chromium Electroplating and Chroming Anodizing Tanks and NESHAP for Pickling-HCl Process Facilities and Hydrochloric Acid

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Regeneration Plants (77 FR 58220, 2012)

- NSPS and NESHAP for Oil and Natural Gas Sector (77 FR 4940, 2012)
- NSPS for Nitric Acid Plants (77 FR 48433, 2012)
- Greenhouse Gas Tailoring Rule Step 3 and Plantwide Applicability Limits (77 FR 41051, 2012)
- NESHAP for Coal- and Oil-Fired Electric Utility Steam Generating Units and NSPS for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small-Industrial-Commercial-Institutional Steam Generating Units (77 FR 9304, 2012)
- NESHAP for Secondary Lead Smelting (77 FR 556, 2012)
- NESHAP for Wood Furniture Manufacturing Operations revision (76 FR 72050, 2011)
- NESHAP for Primary Lead Processing (76 FR 70834, 2011)
- NESHAP for Marine Tank Vessel Loading Operations and NESHAP for Group I Polymers and Resins (76 FR 22566, 2011)
- NESHAP for Major Sources Industrial, Commercial, and Institutional Boiler and Process Heaters (76 FR 15608, 2011)
- Source Determination for Certain Emissions Units in the Oil and Natural Gas Sector (81 FR 35622, 2016)

In this SIP revision, ADEQ has addressed the disapproved BART determinations and reasonable progress determinations. BART determinations are summarized in Section IV of this SIP and additional technical supporting data are found in Appendices A–E. Emissions limitations and schedules of compliance are rendered enforceable by AOs. Therefore, ADEQ requests that EPA approve the emissions limitations and schedules for compliance and enforceability of emissions limitations and control measures included in this SIP and fully approve Arkansas's revised long-term strategy.

VII. Review, Consultations, and Comments

B. EPA Review with Parallel Processing

The State of Arkansas plans to submit this proposed SIP revision, along with a request for parallel processing and a draft notice of public hearing and opportunity for comment, to EPA. Arkansas also requested that EPA stay the NOx emissions limitations for EGUs contained in the AR RH FIP during EPA's review of this SIP revision and withdraw such limitations upon approval of this SIP revision. The request for parallel processing has been included in Tab A of this proposed SIP package.

C. Federal Land Manager Consultation

In accordance with the provisions of 40 C.F.R. § 51.308(i)(2), ADEQ will consult with the

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designated FLM staff personnel. This consultation will give FLMs the opportunity to discuss their assessment of the impact of the proposed SIP revisions on Arkansas Class I areas——Upper Buffalo Wilderness Area and Caney Creek Wilderness Area—and other Class I areas.

On [Date], ADEQ submitted letters to notify the federal land manager staff of this proposed SIP revision and to provide them with electronic access to the revision and related documents. Any comments received from the FLMs will be considered and posted to ADEQ's Regional Haze webpage: https://www.adeq.state.ar.us/air/planning/sip/regional-haze.aspx. The FLM contact list and notification letters are included in Tab E of this proposed SIP package. Comments from FLMs and responses will be included in the final SIP package

D. Consultation with States

For the 2008 AR RH SIP, ADEQ engaged in extensive interstate consultation with states participating in the CENRAP RPO. Because Missouri has two Class I areas impacted by Arkansas sources, ADEQ submitted a letter on [Date] to Missouri Department of Natural Resources (DNR) air pollution control program staff to notify them of this proposed SIP revision and to provide them with electronic access to the revision and related documents. Any comments received from Missouri DNR will be considered and posted to ADEQ's Regional Haze webpage. The notification letter is included in Tab E of this proposed SIP package. Comments from Missouri DNR and responses will be included in the final SIP package.

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E. Public Review

ADEQ will provide notice of a public hearing to receive public comments on this proposed SIP revision. The notice of the proposal and public hearing will be published in the Arkansas Democrat Gazette, which is a newspaper in circulation statewide, at least thirty days prior to the public hearing and will be posted on ADEQ's website concurrently with newspaper publication of the public notice. The notice will provide logistical information regarding the public hearing and the length of the public comment period. The public comment period for this SIP revision will be at least thirty days in accordance with notice requirements under 40 C.F.R. §51.102.

The notice contains information on the availability of the proposed SIP revision for public inspection at ADEQ information depositories, ADEQ headquarters, and ADEQ's Regional Haze webpage.

Both oral and written comments received by ADEQ during the public comment period will be posted on the ADEQ Regional Haze web page. Copies of written comments, a summary of ADEQ's response to comments, and records from the public hearing will be included in the final SIP package.

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VIII. Conclusion

With the NOx Regional Haze SIP submission and this SIP submission together, ADEQ has addressed all disapproved elements of the 2008 AR RH SIP. Arkansas requests that EPA withdraw the AR RH FIP and review and approve this SIP revision, the NOx Regional Haze SIP revision, and Arkansas's "State Implementation Plan Review for the Five-Year Regional Haze Progress Report" submitted in 2015 as expeditiously as possible.

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APPENDIX A

BART Five-Factor Analysis for Arkansas Electric Cooperative Corporation Bailey and McClellan Generating Stations

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PLACEHOLDER

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APPENDIX B

BART Five-Factor Analyses for Domtar Ashdown Mill

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APPENDIX C

BART Five-Factor Analysis for Entergy Arkansas, Inc. Lake Catherine Plant

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APPENDIX D

BART Five-Factor Analyses for Entergy Arkansas, Inc. White Bluff

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APPENDIX E

BART Five-Factor Analysis for Southwest Power Company Flint Creek

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APPENDIX F Administrative Order with Entergy Arkansas, Inc.

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I. Introduction

Arkansas' Class I areas, the Caney Creek Wilderness Area and the Upper Buffalo Wilderness Area, have seen marked improvement in visibility since the start of regional haze monitoring. Based on the Interagency Monitoring of Protected Visual Environment (IMPROVE) data, which reflects monitored visibility impairment in Class I areas, the haze index for the twenty percent worst days of visibility has been steadily improving as a result of reduced emissions within Arkansas and because of broader industrial and energy trends in other states. According to modeling performed by the Central Regional Air Planning Association (CENRAP)[1], all of Arkansas' elevated point sources (including all power plants and large industrial sources) account for only about 2.7% and 2.3% of total light extinction within Caney Creek and Upper Buffalo, respectively. The overwhelming visibility impact comes from non-Arkansas point sources and mobile sources. Because of the Mercury and Air Toxic Standards (MATS) rule[2], the continuing benefits of the Clean Air Interstate Rule (CAIR), the next phase of the Cross State Air Pollution Rule (CSAPR), and the National Ambient Air Quality Standards (NAAQS), along with continuing reductions in emissions from mobile sources, the visibility at Caney Creek and Upper Buffalo will continue to improve. Based on the visibility trends in both Class I areas, the imposition of the State Implementation Plan (SIP) controls, no further action will be necessary to ensure that Arkansas' Class I areas remain below the Uniform Rate of Progress (URP) until at least 2028 and likely even longer as a result of emissions controls that will be required by future regulatory programs and planned retirements of numerous electric generating units.

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A. Arkansas State Implementation Plan Revision

Arkansas has made significant improvements in air quality in recent years. Arkansas is now in attainment for all of the national ambient air quality standards and is well below both the state and the EPA's 2018 regional haze reasonable progress goals. Arkansas is taking steps to revise its regional haze state implementation plan (SIP) to return control of the regional haze program to the state.

Specifically, Arkansas has included in this state implementation plan (SIP) revisions to address disapproved portions of the Arkansas Regional Haze State Implementation Plan (AR RH SIP), submitted to the United States Environmental Protection Agency (EPA) in 2008. In 2012,

[1] CENRAP is a regional planning organization that includes nine states–Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Missouri, Arkansas, and Louisiana. Five such regional organizations are funded by EPA to address the interstate transport nature of the regional haze pollutants. The primary objective of these organizations is to evaluate technical information to better understand the impact of the affiliated states on national strategy and to develop regional strategies to reduce emissions of particulate matter and other pollutants leading to regional haze.

[2] In spite of the Supreme Court decision in Michigan v. EPA, 135 S.Ct. 2699 (2015), which held that EPA must evaluate costs in determining whether it is appropriate and necessary to regulate hazardous air pollutant emissions from electric generating units (EGUs), several EGUs already have installed controls to comply with MATS or have undertaken other steps to reduce their emissions. Even if the rule is stayed or vacated while EPA undertakes its cost analysis, ADEQ expects that the rule will go forward before the end of this planning period along with the associated emission reductions.

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EPA partially approved and partially disapproved the 2008 AR RH SIP.[3] Specifically, the following elements are being submitted for EPA approval:

- BART compliance dates;
- Best available retrofit technology (BART) eligible sources and subject-to-BART Sources;
- BART determinations:
  - Sulfur dioxide (SO_2), nitrogen oxides (NOx), and particulate matter (PM) BART determinations for Arkansas Electric Cooperative Corporation (AECC) Bailey Plant Unit 1;
  - SO_2, NOx, and PM BART determinations for AECC McClellan Plant Unit 1;
  - SO_2 and NOx BART determinations for Southwest Power Company (SWEPCO) Flint Creek Plant Boiler No. 1;
  - SO_2, NOx, and PM BART determinations for the fuel oil firing scenario and NOx BART determination for the natural gas firing scenario at Entergy Arkansas, Inc. (Entergy) Lake Catherine Plant Unit 4;
  - SO_2 and NOx BART determinations under both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Units 1 and 2;
  - BART determination for Entergy White Bluff Plant Auxiliary Boiler;
  - SO_2 and NOx BART determinations for Domtar Ashdown Mill Power Boiler No. 1; and
  - SO_2, NOx, and PM BART determinations for Domtar Ashdown Mill Power Boiler No. 2;
- Reasonable progress goals (RPGs); and
- Long-term strategy.

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The remaining provisions of the 2008 AR RH SIP were approved. Arkansas is not revising portions of the 2008 AR RH SIP that were approved.

B. Arkansas SIP Components Included in this Revision

The following Administrative Orders (AOs) are included in this SIP revision:

- LIS No. xx between Entergy and ADEQ
- LIS No. xx between SWEPCO and ADEQ
- LIS No. xx between AECC and ADEQ
- LIS No. xx between Domtar Ashdown Mill and ADEQ

[3] *Approval and Promulgation of Implementation Plans; Regional Haze State Implementation Plan; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze.* (77 FR 14604, March 12, 2012)

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Inclusion of permanently enforceable emissions limitations and compliance schedules in the included AOs is consistent with and allowable under federal programs.

Sampling, monitoring, and reporting requirements that are generally applicable to stationary sources, including sources for which emissions limitations are established in this SIP, are contained in SIP-approved Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation No. 19 Chapter 7. No revisions to requirements in Regulation No. 19 Chapter 7 were necessary for this SIP revision.

The Arkansas Department of Environmental Quality (ADEQ) asks that EPA withdraw SIP-approved provisions of APC&EC Regulation No. 19 Chapter 15 from the SIP. No changes are needed to EPA's determinations with respect to previously approved BART limitations contained in Regulation No. 19 because these limitations have been included in the respective AOs.

II. Background

In 1977, Congress added § 169 to the Clean Air Act (CAA), which set forth the following goal for restoring pristine conditions in national parks and wilderness areas:

> Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from man-made air pollution.

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In 1980, EPA issued regulations to address visibility degredationthat is "reasonably attributable" to a single source or small group of sources. These regulations primarily addressed "plume blight"—visual impairment of air quality that manifests itself as a coherent plume—rather than overall haze. In 1988, EPA, the states, and federal land managers (FLMs) began monitoring fine particulate matter concentrations and visibility in thirty Class I areas to better understand the species of particulates causing visibility impairment.

When the CAA was amended in 1990, Congress added § 169(B) which authorized research and regular assessments of progress toward restoring visibility in Class I areas and authorized the creation of visibility transport regions and commissions. Specifically, CAA § 169(B)(f) mandated the creation of the Grand Canyon Visibility Transport Commission (GCVTC) to make recommendations to EPA for regions affecting the visibility of the Grand Canyon National Park. EPA relied upon the recommendations of GCVTC and research reports to develop the 1999 "Regional Haze Regulations: Final Rule" (RHR).[4]

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The 1999 RHR sought to address the combined visibility effects of various pollution sources over a wide geographic region with the goal of achieving natural visibility conditions at designated Class I areas by 2064. This required all states, including those that did not have Class I areas to participate in planning, analysis, and emission control programs under the RHR. States with Class I areas were required to conduct certain analyses to establish goals for each Class I area in the state to 1) improve visibility on the haziest days and 2) ensure no degradation occurs on the clearest days. These goals and long-term strategies to achieve these goals were to be included in SIPs covering each ten-year period leading up to 2064. States were also required to submit progress reports in the form of SIP revisions every five years. The 1999 RHR also expanded the existing Class I visibility monitoring network to 108 Class I areas.

For the purposes of assisting with coordination and cooperation among states to address visibility issues, EPA designated five regional planning organizations (RPOs) to assist with coordination and cooperation among states in addressing visibility issues the states have in common. Arkansas was located in the CENRAP RPO. Figure 1 is a map depicting the five RPO regions designated by EPA.

Figure 1 Regional Planning Organizations

In SIPs covering the first ten-year period, states were also specifically required to evaluate controls for certain sources that were not in operation prior to 1962, were in existence in 1977, and had the potential to emit 250 tons per year or more of any air pollutant. These sources were referred to as "BART-eligible sources." States were required to make BART determinations for all BART-eligible sources or consider exempting some sources from BART requirements because they did not cause or

[4] 64 FR 35714

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contribute to visibility impairment in a Class I area. BART-eligible sources that were determined to cause or contribute to visibility impairment in a Class I area were subject to BART controls. In determining BART emissions limitations for each subject-to-BART source, States were required to take into account the existing control technology in place at the source, the cost of compliance, energy and nonair environmental impacts of compliance, remaining useful life of the source, and the degree of visibility improvement that was reasonably anticipated from use of each technology considered. States also had the flexibility to choose an alternative to BART, such as an emissions trading program, that would achieve greater reasonable progress in visibility protection than implementation of source-by-source BART controls. SIPs for the first ten-year planning period were due on December 17, 2007.

In 2005, EPA issued a revised BART rule pursuant to a partial remand of the 1999 RHR by the U.S. Court of Appeals of the DC District Court in 2002.[5] The Court had remanded the BART provisions of the 1999 RHR to EPA and denied industry's challenge to the RHR goals of natural visibility and no degradation. The revised BART rule included guidelines for states to use in determining which facilities must install controls and the type of controls the facilities must use.

In addition to revisions to BART, EPA has also issued rulemakings establishing the CAIR and its successor the CSAPR as approvable alternatives to source-by-source BART controls.[6] EPA has also amended regulatory requirements for state regional haze plans for the second planning period and beyond.[7]

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On September 9, 2008, Arkansas submitted a SIP for the 2008–2018 planning period to comply with regional haze regulations promulgated as of 2005 codified at 40 C.F.R. Part 51. In a 2012 action on the 2008 AR RH SIP, EPA partially approved and partially disapproved the SIP.[8] This partial approval/partial disapproval of the 2008 AR RH SIP triggered a requirement for EPA to either approve a SIP revision by Arkansas or promulgate a federal implementation plan (FIP) within twenty-four months of the final rule partially approving and partially disapproving the 2008 AR RH SIP.

In the 2012 partial approval/partial disapproval of the 2008 AR RH SIP, EPA approved the following elements of the 2008 AR RH SIP:

- Identification of Class I areas affected by sources in Arkansas;

[5] *American Corn Growers Assn. v. EPA*, 291 F.3d.1 (D.C. Cir. 2002)

[6] *Regional Haze Regulations; Revisions to Provisions Governing Alternative to Source-Specific Best Available Retrofit Technology (BART) Determinations* (71, FR 60612, October 13, 2006)
Regional Haze Regulations; Revisions to Provisions Governing Alternative to Source-Specific Best Available Retrofit Technology (BART) Determinations, Limited SIP Disapprovals, and Federal Implementation Plans (77 FR 33642, June 7, 2012).

[7] *Protection of Visibility: Amendments to Requirements for State Plans* (82 FR 3078, January 10, 2017)

[8] *Approval and Promulgation of Implementation Plans; Regional Haze State Implementation Plan; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze.* (77 FR 14604, March 12, 2012)

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- Determination of baseline and natural visibility conditions;
- Determination of a uniform rate of progress (URP);
- Select BART determinations:
  - PM determination on SWEPCO Flint Creek Plant Boiler No. 1;
  - SO_2 and PM determinations for the natural gas firing scenario for Entergy Lake Catherine Plant Unit 4;
  - PM determinations for both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Plant Units 1 and 2; and
  - PM determination for Domtar Ashdown Mill Power Boiler No. 1;
- Consultation with FLMs and other states regarding RPGs and long-term strategy;
- Coordination of regional haze and reasonably attributable visibility impairment (RAVI);
- Regional haze monitoring strategy and other SIP requirements under 40 C.F.R. 51.308(d)(4);
- A commitment to submit periodic regional haze SIP revisions; and
- A commitment to submit periodic progress reports that include a description of progress toward RPG and a determination of adequacy of the existing SIP.

EPA disapproved the following elements of the 2008 AR RH SIP:

- BART compliance dates;
- BART-eligible sources and subject-to-BART sources;
- Select BART determinations:
  - SO_2, NOx, and PM BART determinations for AECC Bailey Plant Unit 1;
  - SO_2, NOx, and PM BART determinations for AECC McClellan Plant Unit 1;
  - SO_2 and NOx BART determinations for SWEPCO Flint Creek Plant Boiler No. 1;
  - SO_2, NOx, and PM BART determinations for the fuel oil firing scenario and NOx BART determination for the natural gas firing scenario at Entergy Lake Catherine Plant Unit 4;
  - SO_2 and NOx BART determinations under both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Units 1 and 2;
  - BART determination for Entergy White Bluff Plant Auxiliary Boiler;
  - SO_2 and NOx BART determinations for Domtar Ashdown Mill Power Boiler No. 1; and
  - SO_2, NOx, and PM BART determinations for Domtar Ashdown Mill Power Boiler No. 2;
- RPGs; and
- Long-term strategy.

On September 27, 2016, EPA finalized a regional haze FIP for Arkansas (AR RH FIP).[9] This FIP

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established new BART requirements for those sources whose BART determinations in the 2008 AR RH FIP were disapproved. The FIP also required the installation of controls at Entergy Independence Units 1 and 2. Despite the previous disapproval of ADEQ's determination in the 2008 AR RH SIP that Georgia Pacific Crossett Mill Boiler 6A and 9A did not cause or contribute to visibility impairment in a Class I area, EPA reversed its decision and concurred with ADEQ that Georgia Pacific Crossett Mill Boiler 6A and 9A are not subject to BART.

On November 22, 2016, the State of Arkansas filed a Petition for Reconsideration and Administrative Stay of the AR RH FIP. In the petition, the State of Arkansas requested that EPA reconsider the AR RH FIP based on new information not raised during the comment period that was of central relevance to the outcome of the FIP. Arkansas asserted that EPA should reconsider controls on Entergy Independence in light of recent data from the IMPROVE monitoring network that shows that Arkansas has already achieved the amount of progress required for the 2008–2018 planning period without having implemented the controls required in the FIP. Arkansas requested that EPA reconsider NOx emissions limitations placed on BART-eligible facilities in light of the recent rulemaking that increased the stringency of the CSAPR. Arkansas also requested reconsideration of the use of low-sulfur coal as BART for SO_2 at Entergy White Bluff during the 2008–2018 planning period. Lastly, Arkansas requested an immediate administrative stay pending completion of EPA's reconsideration of the AR RH FIP.

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On February 3, 2017, the State of Arkansas filed a Petition for Review of the AR RH FIP with the United States Court of Appeals for the Eighth Circuit. On March 8, 2017, the Court held the case in abeyance for ninety days. On April 14, 2017, EPA issued a letter notifying Arkansas that the Agency was convening the reconsideration process for the following:

- Compliance dates for NOx emissions limitations for Flint Creek Unit 1, White Bluff Units 1 and 2, and Independence Units 1 and 2;
- Low-load NOx limitations applicable to White Bluff Units 1 and 2 and Independence Units 1 and 2 during periods of operation at less than fifty percent of the unit's maximum heat input rating;
- SO_2 emissions limitations for White Bluff Units 1 and 2; and
- Compliance dates for SO_2 emissions limitations for Independence Units 1 and 2.

On April 25, 2017, EPA published in the Federal Register a partial stay of the effectiveness of the AR RH FIP (82 FR 18994). Specifically, EPA stayed from April 25,

[9] *Promulgation of Air Quality Implementation Plans; State of Arkansas; Regional Haze and Interstate Visibility Transport Federal Implementation Plan; Final Rule* (81 FR 66332, September 27, 2016)

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2017 until July 24, 2017 (ninety days) the compliance dates for the NOx emissions limitations at AECC Flint Creek Unit 1, White Bluff Units 1 and 2, and Independence Units 1 and 2, as well as the compliance dates for the SO_2 emissions limitations for White Bluff units 1 and 2 and Independence Units 1 and 2. This action did not alter or extend the ultimate compliance dates for these units nor did it stay requirements for other units subject to the FIP.

On July 8, 2017, ADEQ proposed revisions to the State's Regional Haze SIP specifically to address NOx from electric generating units (NOx Regional Haze SIP). The NOx Regional Haze SIP revision sought to replace source-specific NOx BART determinations included in the 2008 AR RH SIP, as well as the NOx limitations promulgated under the AR RH FIP, with reliance on the CSAPR trading program. The NOx Regional Haze SIP revision proposal demonstrates that Arkansas meets all of the current requirements under 40 C.F.R. § 51.308(e)(4) for an alternative to NOx BART. ADEQ submitted the proposed NOx Regional Haze SIP to EPA Region 6 on July 12, 2017 and requested parallel processing. EPA proposed approval of the NOx Regional Haze SIP on September 11, 2017.[10]

On July 13, 2017, EPA proposed revisions to the AR RH FIP that would extend the compliance dates for the NOx emissions limitations at AECC Flint Creek Unit 1, White Bluff Units 1 and 2, and Independence Units 1 and 2.[11] In the proposal, EPA stated that the Petition for Reconsideration submitted by the State of Arkansas on November 22, 2016, as well as the petitions submitted by the owners of the five units, raised certain arguments regarding the feasibility of eighteen-month NOx compliance dates for the five units that have merit and warrant proposal of a revision to the AR RH FIP with respect to those compliance dates. Therefore, EPA proposed extension of the NOx compliance dates by twenty-one months.

On July 31, 2017, the Eighth Circuit Court of Appeals granted a motion by the parties to hold the case in which the EPA's FIP is at issue in abeyance until September 26, 2017. On October 2, 2017, the court subsequently issued an order that continued the abeyance until October 31, 2017, as requested by the parties' joint status report.

III. Revisions to BART-Eligible and Subject-to-BART Sources

EPA disapproved the list of BART-Eligible and subject-to-BART sources included in the 2008 AR RH SIP. The 2008 AR RH SIP inadvertently omitted Georgia Pacific Crossett Mill Boiler 6A and 9A from the list of BART-eligible sources in Table 9.1 on page 45; however, Georgia Pacific Crossett Mill 6A and 9A were included in the list of BART-eligible sources adopted into

[10] 82 FR 42627
[11] 82 FR 32284

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APC&EC Regulation No. 19 and submitted with the 2008 AR RH SIP.

Table 1 below is a correction to the list of BART-eligible units in Arkansas in the SIP.

Table 1 Facilities with BART-Eligible Units in the State of Arkansas

BART Source Category Number and Name	Facility Name	Arkansas Facility Identification Number	Unit ID	Unit Description
1. Fossil fuel-fired Electric Plants > 250 million British thermal units (MMbtu)/hour – Electric Generating Units (EGUs)	AECC Carl E. Bailey	74-00024	SN-01	Boiler
	AECC McClellan	52-00055	SN-01	Boiler
	Entergy Lake Catherine Plant	30-00011	SN-03	Unit 4 Boiler
	Entergy Ritchie	54-00017	SN-02	Unit 2
	Entergy White Bluff	35-00110	SN-01	Unit 1 Boiler
			SN-02	Unit 2 Boiler
			SN-05	Auxiliary Boiler
	SWEPCO Flint Creek Power Plant	04-00107	SN-01	Boiler
3. Kraft Pulp Mills	Domtar Industries, Inc. Ashdown Mill	41-00002	SN-03	#1 Power Boiler
			SN-05	#2 Power Boiler
	Delta Natural Kraft and Mid America Packaging, LLC.	35-00017	SN-02	Recovery Boiler
	Evergreen Packaging Inc., Pine Bluff Mill	35-00016	SN-04	#4 Recovery Boiler
	Georgia-Pacific Corporation Crossett Paper Operations	02-00013	SN-19	6A Boiler
			SN-22	9A Boiler

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	Green Bay Packaging, Inc. Arkansas Kraft Division	15-00001	SN-05A	Recovery Boiler
	Potlatch Forest Products Corporation – Cypress Bend Mill	21-00036	SN-04	Power Boiler
11. Petroleum Refineries	Lion Oil Company	70-00016	SN-809	#7 Catalyst Regenerator
15. Sulfur Recovery Plant	Albemarle Corporation South Plant	14-00028	SR-01	Tail Gas Incinerator
19. Sintering Plants	Big River Industries	18-00082	SN-01	Kiln A
21. Chemical Processing Plants	Albemarle Corporation South Plant	14-00028	BH-01 BH-02	Boiler #1 Boiler #2
	FutureFuel Chemical Co.	32-00036	6M01-01	3 Coal Boilers
	El Dorado Chemical Company	70-00040	SN-08 SN-09 SN-10	West Nitric Acid Plant East Nitric Acid Plant Nitric Acid Concentrator

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Although EPA initially disapproved ADEQ's determination in the 2008 AR RH SIP that Georgia Pacific Crossett Mill Boiler 6A and 9A did not cause or contribute to visibility impairment in a Class I area and were not subject to BART, EPA reversed its decision in the 2016 AR RH FIP and concurred with ADEQ that Georgia Pacific Crossett Mill Boiler 6A and 9A are not subject to BART. Therefore, no revisions are necessary to the list of subject-to-BART sources in Arkansas included in the 2008 AR RH SIP.

Table 2 lists the subject-to-BART sources in Arkansas.

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Table 2 Facilities with Subject-to-BART Units in the State of Arkansas

BART Source Category Number and Name	Facility Name	Arkansas Facility Identification Number	Unit ID	Unit Description
1. Fossil fuel-fired Electric Plants > 250 million British thermal units (MMbtu)/hour – Electric Generating Units (EGUs)	AECC Carl E. Bailey	74-00024	SN-01	Boiler
	AECC McClellan	52-00055	SN-01	Boiler
	Entergy Lake Catherine Plant	30-00011	SN-03	Unit 4 Boiler
	Entergy White Bluff	35-00110	SN-01	Unit 1 Boiler
			SN-02	Unit 2 Boiler
			SN-05	Auxiliary Boiler
	SWEPCO Flint Creek Power Plant	04-00107	SN-01	Boiler
3. Kraft Pulp Mills	Domtar Industries, Inc. Ashdown Mill	41-00002	SN-03	#1 Power Boiler
			SN-05	#2 Power Boiler

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IV. Revisions to BART Determinations

Among the provisions disapproved in EPA's 2012 action on the 2008 AR RH SIP, were several BART determinations. Specifically, EPA disapproved the:

- SO_2, NOx, and PM BART determinations for AECC Bailey Plant Unit 1;
- SO_2, NOx, and PM BART determinations for AECC McClellan Plant Unit 1;
- SO_2 and NOx BART determinations for SWEPCO Flint Creek Plant Boiler No. 1;

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- SO_2, NOx, and PM BART determinations for the fuel oil firing scenario and NOx BART determination for the natural gas firing scenario at Entergy Lake Catherine Plant Unit 4;
- SO_2 and NOx BART determinations under both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Units 1 and 2;
- BART determination for Entergy White Bluff Plant Auxiliary Boiler;
- SO_2 and NOx BART determinations for Domtar Ashdown Mill Power Boiler No. 1; and
- SO_2, NOx, and PM BART determinations for Domtar Ashdown Mill Power Boiler No. 2.

EPA did approve the following BART determinations:

- PM determination on SWEPCO Flint Creek Plant Boiler No. 1;
- SO_2 and PM determinations for the natural gas firing scenario for Entergy Lake Catherine Plant Unit 4;
- PM determinations for both bituminous and sub-bituminous coal firing scenarios for Entergy White Bluff Plant Units 1 and 2; and
- PM determination for Domtar Ashdown Mill Power Boiler No. 1.

In this SIP revision, ADEQ is addressing all disapproved emissions limitations and compliance schedules. All emissions limitations, including those previously approved SIP provisions in Regulation No. 19 Chapter 15, will be rendered enforceable through AOs with each subject-to-BART source. ADEQ requests that EPA withdraw previously SIP-approved BART determinations contained in APC&EC Regulation No. 19 Chapter 15 and approve these AOs into the SIP.

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The statutory five factors established in U.S.C. § 7491(g)(2) were analyzed for each subject-to-BART unit. These analyses and the emissions limitations determined thereupon are summarized in Sections IV.A–F of this SIP. The analyses are provided in Appendices A–E. Pursuant to Ark. Code Ann. § 8-4-317, ADEQ also considered the factors set forth in Ark. Code Ann. § 8-4-312 for emissions limitations included in this SIP revision to satisfy BART requirements. The emissions limitations included in this SIP are based upon generally accepted scientific knowledge and engineering practices. The need for each measure in attaining or maintaining the national ambient air quality standards is not applicable to the regional haze program. Table 3 describes how each factor set forth in Ark. Code Ann. § 8-4-312 was considered.

Table 3 Consideration of Ark. Code Ann. § 8-4-312 for BART Limitations

Ark. Code Ann. § 8-4-312 Factors	Consideration of the Factors
(1) The quantity and characteristics of air contaminants and the duration of their presence in the atmosphere that may cause air pollution in a particular area of the state;	These characteristics were considered in modeling conducted for each source's BART analysis.

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(2) Existing physical conditions and topography;	Modeling in support of the emissions limitations established in this SIP utilizes these factors as inputs.
(3) Prevailing wind directions and velocities;	Modeling in support of the emissions limitations established in this SIP utilizes these factors as inputs.
(4) Temperatures and temperature-inversion periods, humidity, and other atmospheric conditions;	Modeling in support of the emissions limitations established in this SIP utilizes these factors as inputs.
(5) Possible chemical reactions between air contaminants or between such air contaminants and air gases, moisture, or sunlight;	Modeling in support of the emissions limitations established in this SIP utilizes these factors as inputs.
(6) The predominant character of development of the area of the state such as residential, highly developed industrial, commercial, or other characteristics	The predominant character of development of the area of the state impacted by this SIP includes Class I areas—specifically Upper Buffalo and Caney Creek Wilderness Areas. The Class I areas are protected and remain deliberately undeveloped. Furthermore enhanced visibility in these areas will benefit the primary driver of development around Class I areas: tourism.
(7) Availability of air-cleaning devices;	Availability of air cleaning devices was considered as part of each BART analysis.
(8) Economic feasibility of air-cleaning devices	Economic feasibility of air cleaning devices was considered as part of each BART analysis.
(9) Effect on normal human health of particular air contaminants	This factor is not applicable to the regional haze program, which targets visibility improvements.
(10) Effect on efficiency of industrial operation resulting from use of air-cleaning devices;	Effect on efficiency of air cleaning devices was considered as part of each BART analysis.
(11) The extent of danger to property in the	This factor is not applicable to the regional

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area reasonably to be expected from any particular air contaminant;	haze program, which targets visibility improvements.
(12) Interference with reasonable enjoyment of life by persons in the area and conduct of established enterprises that can reasonably be expected from air contaminants;	Visibility improvements are expected to occur at Arkansas Class I areas in the State as a result of the emissions limitations included in this SIP. Visitors to Caney Creek and Upper Buffalo Wilderness Areas are expected to enjoy these improvements. Persons that conduct tourism enterprises may also benefit as a result of the BART controls required in this SIP. Costs of control may be passed on to customers of the sources for which ADEQ is establishing emissions limitations; however, these costs are anticipated to be lower in this SIP than in the AR RH FIP that this SIP seeks to replace.
(13) The volume of air contaminants emitted from a particular class of air contamination sources;	The volume of air contaminants emitted from subject-to-BART sources for which controls are included in this SIP are factored into the BART analysis.
(14) The economic and industrial development of the state and the social and economic value of the air contamination sources;	Costs of control may be passed on to customers of the sources for which ADEQ is establishing emissions limitations. This may have a negative impact on economic and industrial development in the State. However, these costs are anticipated to be lower in this SIP than in the AR RH FIP that this SIP seeks to replace.
(15) The maintenance of public enjoyment of the state's natural resources; and	Visibility improvements are expected to occur at Arkansas Class I areas in the State as a result of the emissions limitations included in this SIP. Visitors to Caney Creek and Upper Buffalo Wilderness Areas are expected to enjoy these improvements. Persons that conduct tourism enterprises may also benefit as a result of the BART

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	controls required in this SIP.
(16) Other factors that the department or the commission may find applicable.	Other factors considered by the Department in setting BART controls for subject-to-BART sources are contained in the Sections IV.A–F and Appendices A–E of this SIP.

B. Arkansas Electric Cooperative Corporation Carl E. Bailey Generating Station

AECC produced a BART analysis (dated March 2014, Version 4) for the Carl E. Bailey Generating Station. EPA used this analysis in the development of the AR RH FIP and ADEQ has made its BART determination included in this SIP based on the analysis provided by AECC. This analysis is provided in Appendix A of this SIP and summarized below.

AECC Bailey Plant Unit 1 is a 122 megawatt wall-fired boiler installed in 1966. Unit 1 has a maximum heat input of 1,350 million British thermal units per hour (MMBtu/hr). AECC Bailey Plant Unit 1 burns pipeline quality natural gas as the primary fuel and No. 6 fuel oil as a secondary fuel. AECC Bailey Plant Unit 1 meets the BART-eligibility criteria. Also, ADEQ determined, based on results of previous air dispersion modeling, that the AECC Bailey Plant Unit 1 contributes greater than 0.5 dv to visibility impairment in at least one Class I area. Although, more recent modeling conducted by Trinity Consultants (Trinity) shows impacts for AECC Bailey Unit 1 that are less than 0.5 dv, AECC conducted a complete BART analysis and identified the AECC Bailey Plant Unit 1 source as the sole AECC Bailey source subject to BART. Consequently, the five BART statutory factors were considered for AECC Bailey Unit 1.

1. Summary of BART Analysis for SO_2

The available control options for AECC Bailey Plant Unit 1 when burning fuel oil are flue gas desulfurization (FGD) systems and fuel switching. No control technologies were evaluated for natural gas burning scenarios due to the intrinsically low sulfur content of natural gas. FGD systems were considered technically infeasible. Fuel switching was the only technically feasible control option.

Fuel oil stored at AECC Bailey since 2006 had an average sulfur content of 1.81% by weight, therefore one percent sulfur No. 6 fuel oil, 0.5% sulfur No. 6 fuel oil, and diesel were considered. Fuel switching to one percent sulfur fuel oil at AECC Bailey Plant Unit 1 would result in up to a forty-five percent control efficiency for SO_2. Switching to 0.5% fuel oil would result in a seventy-two percent control efficiency and switching to 0.05% sulfur diesel would result in a ninety-seven percent control efficiency.

a. Existing Controls in Use at the Source

AECC Bailey does not have existing SO_2 control technology.

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b. Cost of Compliance

The fuel-switching options evaluated do not require capital investments in equipment; therefore, annual costs are based upon operation and maintenance costs associated with the different fuels. The cost-effectiveness of switching to one percent sulfur No. 6 fuel oil is $1,198/ton of SO_2 reduced. The cost-effectiveness of switching to 0.5% sulfur No. 6 fuel oil is $2,559/ton. The cost-effectiveness of switching to diesel is $5,382/ton, which is out of the range typically identified as cost-effective. Both 0.5% sulfur No. 6 fuel oil and one percent sulfur No. 6 fuel oil were within the range typically considered cost-effective.

c. Energy and Nonair Quality Environmental Impacts

AECC concluded that there are no energy or nonair quality impacts associated with fuel switching.

d. Remaining Useful Life

The remaining useful life of Bailey Unit 1 does not impact the annualized costs of evaluated control technologies since it is assumed that fuel switching will not require any significant capital costs.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated technologies are included in Table 5-13 at page 5-12 of AECC's BART analysis. Fuel switching to one percent sulfur No. 6 fuel oil would result in a 41.52% reduction in visibility impairment from AECC Bailey at Caney Creek Wilderness Area, a 44.25% reduction at Upper Buffalo Wilderness Area, a 44.02% reduction at Hercules Glades Wilderness Area, and a 45.65% reduction at Mingo Wilderness Area. Fuel switching to 0.5% sulfur No. 6 fuel oil would result in a 56.97% reduction in visibility impairment from AECC Bailey at Caney Creek Wilderness Area, a 63.51% reduction at Upper Buffalo Wilderness Area, a 63.32% reduction at Hercules Glades Wilderness Area, and a 55.15% reduction at Mingo Wilderness Area.

f. BART Requirements for SO_2

Based on cost/ton of SO_2 emissions reduced and visibility improvement among low sulfur fuels, AECC determined that SO_2 BART for AECC Bailey Plant Unit 1 is using fuel oil and natural gas with 0.5% sulfur or less. ADEQ concurs with AECC's BART determination for SO_2 at Bailey Plant Unit 1.

AO LIS No. xx includes enforceable limitations and compliance dates consistent with ADEQ's BART determination.

2. Summary of BART Analysis for PM

Available PM retrofit control technologies include: dry electrostatic precipitator (Dry ESP), wet electrostatic precipitator (Wet ESP), fabric filter, wet scrubber, a cyclone, and fuel switching. Dry ESP and fabric filters were considered technically infeasible.

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A Wet ESP, with an estimated PM control efficiency of up to ninety percent, is a technically feasible option for PM control.

The use of a wet scrubber, with an estimated PM removal efficiency of around fifty-five percent, is a technically feasible option.

A cyclone is a technically feasible option. When clean oil is combusted, a high percentage of small particles are emitted and cyclones are not effective at controlling the smaller particles that are the primary source of visibility impairment, although when including the larger particles an eighty-five percent reduction in PM can be expected.

Fuel switching to lower sulfur content fuel is a technically feasible option. Reductions in filterable PM for No. 6 fuel oil are directly related to the sulfur content of the fuel and greater than a ninety-nine percent reduction of PM is expected solely from a fuel switch to natural gas.

a. Existing Controls in Use at the Source

AECC Bailey does not have existing PM control technology.

b. Cost of Compliance

The cost of compliance differs among the control technologies evaluated. Add-on controls such as Wet ESP, wet scrubber, and cyclone systems involve capital costs for new equipment that were annualized over a fifteen year period for the analysis. Fuel-switching options have associated operation and maintenance costs, but no capital costs. The cost-effectiveness values of all evaluated options exceed $22,000/ton of PM removed, which is higher than the range typically considered cost-effective.

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c. Energy and Nonair Quality Environmental Impacts

AECC concluded that there are no energy or nonair quality impacts associated with fuel switching; however, there are impacts associated with wet ESPs and wet scrubbers. These impacts were factored into the cost of compliance.

d. Remaining Useful Live

AECC anticipated that the remaining useful life of the AECC Bailey Plant Unit 1 is at least as long as the capital cost recovery period of fifteen years.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated add-on technologies are included in Table 7-8 at page 7-9 of AECC's BART analysis and improvements that would be anticipated from fuel switching are included in Table 5-13 at page 5-12. Although no control options were considered cost-effective for PM, AECC determined that switching to 0.5% sulfur No. 6 fuel oil was cost-effective for SO_2. Visibility improvements anticipated from fuel switching to a lower sulfur content fuel oil are discussed in section IV.A.1.e. above.

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f. BART Requirements for PM

AECC proposed that no fuel changes or add-on controls constitute PM BART for AECC Bailey Unit 1. In addition, the BART determination for SO_2 of fuel switching to 0.5 % sulfur No. 6 fuel oil will result in PM reductions. ADEQ concurs with this AECC's BART determination for PM at Bailey Plant Unit 1.

C. Arkansas Electric Cooperative Corporation John L. McClellan Generating Station

AECC produced a BART analysis (dated March 2014, Version 4) for the John L. McClellan Generating Station. EPA used this analysis in the development of the AR RH FIP and ADEQ has made its BART determination included in this SIP based on the analysis provided by AECC. This analysis is provided in Appendix A of this SIP and summarized below.

AECC McClellan Plant Unit 1 is a 122 megawatt wall-fired boiler installed in 1971. AECC McClellan Plant Unit 1 has a maximum heat input of 1,436 MMBtu/hr. AECC McClellan Plant Unit 1 burns pipeline quality natural gas as the primary fuel and No. 6 fuel oil as a secondary fuel. AECC McClellan Plant Unit 1 meets the BART-eligibility criteria. Also, ADEQ determined, based on results of previous air dispersion modeling, that the AECC McClellan Plant Unit 1 contributes greater than 0.5 dv to visibility impairment in at least one Class I area. Therefore, AECC conducted a complete BART analysis and identified the AECC McClellan Plant Unit 1 source as the sole AECC McClellan source subject to BART. Consequently, the five BART statutory factors were considered for AECC McClellan Unit 1.

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1. Summary of BART Analysis for SO_2

The available control options for AECC McClellan Unit 1 when burning fuel oil are FGD systems and fuel switching. No control technologies were evaluated for natural gas burning scenarios due to the intrinsically low sulfur content of natural gas. FGD systems were considered technically infeasible. Fuel switching was the only technically feasible control option.

Fuel oil stored at AECC McClellan since 2009 had an average sulfur content of 1.38 percent by weight, therefore one percent sulfur No. 6 fuel oil, 0.5% sulfur No. 6 fuel oil, and diesel were considered. Fuel switching to one percent sulfur fuel oil at AECC McClellan Plant Unit 1 would result in up to a twenty-eight percent control efficiency for SO_2. Switching to 0.5% fuel oil would result in a sixty-four percent control efficiency and switching to 0.05% sulfur diesel would result in a ninety-six percent control efficiency.

a. Existing Controls in Use at the Source

AECC McClellan does not have existing SO_2 control technology.

b. Cost of Compliance

The fuel-switching options evaluated do not require capital investments in equipment; therefore, annual costs are based upon operation and maintenance costs associated with the different fuels. The cost-effectiveness of switching to one percent sulfur No. 6 fuel oil is $2,457/ton of SO_2 reduced. The cost-effectiveness of switching to 0.5% sulfur No. 6 fuel oil is $4,553/ton. The cost-

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effectiveness of switching to diesel is $10,698/ton, which is out of the range typically identified as cost-effective. Both 0.5% sulfur No. 6 fuel oil and one percent sulfur No. 6 fuel oil were within the range typically considered cost-effective.

c. Energy and Nonair Quality Environmental Impacts

AECC concluded that there are no energy or nonair quality impacts associated with fuel switching.

d. Remaining Useful Life

The remaining useful life of McClellan 1 does not impact the annualized costs of evaluated control technologies since it is assumed that fuel switching will not require capital investments in new equipment.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated technologies are included in Table 5-13 at page 5-12 of AECC's BART analysis. Fuel switching to one percent sulfur No. 6 fuel oil would result in a 13.67% reduction in visibility impairment from AECC McClellan at Caney Creek Wilderness Area, a 13.16% reduction at Upper Buffalo Wilderness Area, a 12.55% reduction at Hercules Glades Wilderness Area, and a 15.35% reduction at Mingo Wilderness Area. Fuel switching to 0.5% sulfur No. 6 fuel oil would result in a 48.23% reduction in visibility impairment from AECC McClellan at Caney Creek Wilderness Area, a 45.11% reduction at Upper Buffalo Wilderness Area, a 50.22% reduction at Hercules Glades Wilderness Area, and a 40.35% reduction at Mingo Wilderness Area.

f. BART Requirements for SO_2

Based on cost/ton of SO_2 emissions reduced and visibility improvement among low sulfur fuels, AECC determined that SO_2 BART for AECC McClellan Plant Unit 1 is using fuel oil and natural gas with 0.5% sulfur or less. ADEQ concurs with AECC's BART determination for SO_2 at McClellan Plant Unit 1.

AO LIS No. xx includes enforceable limitations and compliance dates consistent with ADEQ's BART determination.

2. Summary of BART Analysis for PM

Available PM retrofit control technologies include: Dry ESP, Wet ESP, fabric filters, wet scrubber, a Cyclone, and fuel switching. Dry ESP and fabric filters were considered technically infeasible.

A Wet ESP, with an estimated PM control efficiency of up to ninety percent, is a technically feasible option for PM control.

The use of a wet scrubber, with an estimated PM removal efficiency of around fifty-five percent, is a technically feasible option.

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A cyclone is a technically feasible option. When clean oil is combusted, a high percentage of small particles are emitted and cyclones are not effective at controlling the smaller particles that are the primary source of visibility impairment, although when including the larger particles an eighty-five percent reduction in PM can be expected.

Fuel switching to lower sulfur content fuel is a technically feasible option. Reductions in filterable PM for No. 6 fuel oil are directly related to the sulfur content of the fuel and greater than a ninety-nine percent reduction of PM is expected solely from a fuel switch to natural gas.

a. Existing Controls in Use at the Source

AECC McClellan does not have existing PM control technology.

b. Cost of Compliance

The cost of compliance differs among the control technologies evaluated. Add-on controls such as Wet ESP, wet scrubber, and cyclone systems involve capital costs for new equipment that were annualized over a fifteen year period for the analysis. Fuel-switching options have associated operation and maintenance costs, but no capital costs. The cost-effectiveness of all evaluated options exceeds $14,000/ton of PM removed, which is higher than the range typically considered cost-effective.

c. Energy and Nonair Quality Environmental Impacts

AECC concluded that there are no energy or nonair quality impacts associated with fuel switching; however, there are impacts associated with wet ESPs and wet scrubbers. These impacts were factored into the cost of compliance.

d. Remaining Useful Live

AECC anticipated that the remaining useful life of the AECC McClellan Plant Unit 1 is at least as long as the capital cost recovery period of fifteen years.

e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated add-on technologies are included in Table 7-9 at page 7-10 of AECC BART analysis and improvements that would be anticipated from fuel switching are included in Table 5-14 at page 5-13. Although no control options were considered cost-effective for PM, AECC determined that switching to 0.5% sulfur No. 6 fuel oil was cost-effective for SO_2. Visibility improvements anticipated from fuel switching to a lower sulfur content fuel oil are discussed in section IV.A.1.e. above.

f. BART Requirements for PM

AECC proposed that no fuel changes or add-on controls constitute PM BART for AECC McClellan Unit 1. In addition, the BART determination for SO_2 of fuel switching to 0.5 % sulfur No. 6 fuel oil will result in PM reductions. ADEQ concurs with this AECC's BART determination for PM at McClellan Plant Unit 1.

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D. Domtar Industries, Inc. Ashdown Mill

Domtar produced a revised BART analysis (dated May 2014) for Domtar Ashdown Mill that updated emissions information from previous BART analyses (dated October 2006 and March 2007). These BART analyses were used by EPA in the AR RH FIP and ADEQ has made its BART determination included in this SIP based on these analyses. On xx xx, 2017 Domtar provided additional information to ADEQ regarding an alternative to BART that would achieve greater visibility improvements than the BART controls included in the AR RH FIP. The 2007 and 2014 BART analyses, as well as the alternative to BART analysis, are provided in Appendix B of this SIP and summarized below.

Domtar Ashdown Mill has two power boilers subject to BART: Power Boiler No. 1 and Power Boiler No. 2. Power Boiler No. 1 was installed in 1967–68 and has a design heat input rate of 580 MMBtu/hr. Power Boiler No. 1 is capable of burning a variety of fuels including bark, wood waste, tire-derived fuel, municipal yard waste, pelletized paper fuel, fuel oil, reprocessed fuel oil and natural gas; however, Power Boiler No. 1 is currently restricted by permit to burning natural gas. Power Boiler No. 2 was installed in 1975 and has a design heat input rate of 820 MMBtu/hr. Power Boiler No. 2 is capable of burning a variety of fuels including bark, pulverized bituminous coal, tire-derived fuel, pelletized paper fuel, municipal yard waste, natural gas, and petroleum coke. Domtar Ashdown Mill Power Boilers No. 1 and No. 2 meet the BART-eligibility criteria. Dispersion modeling of emissions from Domtar Ashdown Mill included in the 2008 AR RH SIP shows that the mill contributes greater than 0.5 dv to visibility impairment in at least Class I area. Therefore, Domtar Ashdown Mill Power Boilers No. 1 and No. 2 are subject-to-BART and the five BART statutory factors were considered for each boiler.

1. Summary of BART Analyses for SO_2

a. Power Boiler No. 1

In 2007, Domtar installed a Wet ESP on Power Boiler No. 1 to achieve the maximum achievable control technology standards required under 40 C.F.R. part 63 subpart DDDDD—"National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial Commercial and Institutional Boilers and Process Heaters." Installation of the Wet ESP on Power Boiler No. 1 resulted in reductions in PM and SO_2 emissions from Power Boiler No. 1 from the original 2001–2003 baseline used in modeling for the 2008 AR RH SIP. Therefore, Domtar remodeled emission impacts from Power Boiler No. 1 based on a 2009–2011 baseline. Based on the revised modeling, visibility impacts due to SO_2 emissions from Power Boiler No. 1 are already very low (<0.335 dv) and any emissions reductions associated installation and operation of SO_2 controls would be negligible. In the AR RH FIP, EPA concluded that the cost of controls for SO_2 for Power Boiler No. 1 could not be justified due to the negligible visibility impacts of Power Boiler No. 1 with the existing control technology; therefore, EPA established that the SO_2 BART limitation for Power Boiler No. 1 when burning bark, wood waste, tire-derived fuel, municipal

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yard waste, pelletized paper fuel, fuel oil, or reprocessed fuel oil is 504 lb/day on a rolling 30-boiler-operating day averaging period based on operation of existing controls. In the AR RH FIP, EPA also finalized an alternative to demonstrating compliance with their SO_2 BART determination for Power Boiler No. 1. In lieu of reporting and recordkeeping requirements associated with meeting the SO_2 BART emissions limitation for Power Boiler No. 1, the AR RH FIP allowed Domtar to demonstrate compliance by revising its air permit to reflect that Power Boiler No. 1 is allowed to burn only pipeline quality natural gas. On October 18, 2016, a permit modification was issued for Domtar with a specific condition requiring Domtar to combust only pipeline quality natural gas at Power Boiler No. 1.[12]

ADEQ concurs with EPA on the SO_2 BART determination for Power Boiler No. 1 that no additional controls are necessary. In light of recent changes to Domtar's air permit, ADEQ has determined SO_2 BART for Power Boiler No. 1 is satisfied by Domtar's fuel switch to natural gas.

b. Power Boiler No. 2

The available SO_2 retrofit control technology options for Domtar Power Boiler No. 2 include upgrades to existing venturi scrubbers and a new add-on spray scrubbers that would be operated downstream of the existing scrubbers. Both control options were considered technologically feasible.

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Domtar was unable to quantify the marginal additional control that could be achieved through upgrades to the existing venturi scrubbers, which are already capable of ninety percent control efficiency for SO_2; however, average control efficiency based on 2011–2013 data is closer to sixty-nine percent according to EPA in the AR RH FIP. An add-on spray scrubber would result in ninety percent control of SO_2 remaining downstream of the existing venturi scrubbers.

i. Existing Controls in Use at the Source

Domtar Ashdown Mill Power Boiler No. 2 is equipped with two venturi wet scrubbers.

ii. Cost of Compliance

Domtar estimated that, based on their annual-average baseline emission rate of 2,078 tpy, the cost-effectiveness of an add-on spray scrubber would be $5,300/ton without consideration of additional construction at the facility that would be necessary to accommodate the add-on spray scrubber. This falls outside of the range that is typically considered cost-effective. In the AR RH FIP, EPA also included an additional BART option not considered by Domtar: optimization of the existing venturi scrubbers by using additional scrubbing reagent to achieve closer to the ninety percent control efficiency rating of the scrubbers. The control efficiency of using additional scrubbing reagent is $1,411/ton SO_2.

[12] 287-AOP-R18

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iii. Energy and Nonair Quality Environmental Impacts

No energy or nonair quality environmental impacts associated with the evaluated controls were identified in Domtar's analysis or EPA's analysis.

iv. Remaining Useful Life

The remaining useful life for Domtar Power Boiler No. 2 is anticipated to be at least as long as the thirty-year life of the add-on spray scrubbers evaluated.

v. Degree of Visibility Improvement as a Result of Controls

Installation and operation of an add-on spray scrubber for Power Boiler No. 2 would have a 0.146 dv or less impact at any given Class I areas. In the AR RH FIP, EPA concluded that the limited visibility improvement that would be achieved by installation and operation of an add-on spray scrubber does not justify their high cost-effectiveness and ADEQ concurs. Optimization of the existing venturi scrubbers by using additional scrubbing reagent would result in a 0.139 dv impact or less at any given Class I area.

vi. BART Requirements for SO_2

Given the low cost-effectiveness value associated with the modeled visibility improvement, EPA determined that additional scrubbing reagent is BART for Power Boiler No. 2. ADEQ concurs with this determination and the emissions limitation for SO_2 BART at Power Boiler No. 2 of 91.5 lb SO_2/hr on a 30 boiler-operating day averaging period.

2. Summary of BART Analysis for NOx

The available NOx retrofit control technology options for Domtar Ashdown Mill Power Boilers No. 1 and No. 2 include: selective non-catalytic reduction (SNCR), selective catalytic reduction (SCR), low NOx burners (LNB) and ultra-low NOx burners (ULNB), over-fire air (OFA), reburning/Methane de-NOx (MdN), flue gas recirculation (FGR), and fuel blending/boiler operational modifications/tuning/optimization.

a. Power Boiler No. 1

FGR, LNB, ULNB, OFA, MdN, and SCR were considered to be technically infeasible for use at Power Boiler No. 1. Domtar's NOx BART analysis for Power Boiler No. 1 focused on SNCR.

SNCR is a post-combustion NOx control technology that uses urea or ammonia to reduce NOx to nitrogen and water. For boilers with steady flue gas flow patterns and temperature distribution, SNCR typically achieves about a fifty percent NOx reduction; however, SNCR on boilers that operate with changing loads are unlikely to achieve greater than a thirty percent NOx reduction according to the National Council for Air and Stream Improvement. Therefore, Domtar provided NOx emission reduction and cost-effectiveness estimates for three control efficiency scenarios at

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Domtar Ashdown Power Boiler No. 1: 20%, 32.5%, and 45%.

i. Existing Controls in Use at the Source

Fuel blending/boiler operational modifications/tuning/optimization is already in use at Power Boiler No. 1.

ii. Cost of Compliance

Based on actual annual average emissions at Power Boiler No. 1, Domtar estimated that cost-effectiveness for the different SNCR scenarios would range from $7,640–$12,700/ton of NOx.

iii. Energy and Nonair Quality Environmental Impacts

No energy or nonair quality environmental impacts associated with SNCR were identified in Domtar's analysis.

iv. Remaining Useful Life

The remaining useful life for Domtar Power Boiler No. 1 is anticipated to be at least as long as the thirty-year life of the SNCR system evaluated.

v. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from the various SNCR control efficiencies are included in Table 6-3 at page 6-3 of Domtar's 2014 BART analysis. Because Power Boiler No. 1 does not contribute to visibility impairment greater than 0.5 dv on any single day at any of Arkansas's or Missouri's Class I areas, the modeled visibility improvements anticipated as a result of installation of evaluated NOx control technologies on Power Boiler No. 1 are minimal (< 0.017 Δdv).

vi. BART Requirements for NOx

Based on these cost-effectiveness estimates, ADEQ has determined SNCR is not BART for Power Boiler No. 1. EPA similarly determined that SNCR is not BART for Power Boiler No. 1 and that compliance with an emissions rate of 207.4 lb/hr (Power Boiler No. 1's baseline emissions rate) was sufficient to meet BART requirements for NOx at Power Boiler No. 1. ADEQ concurs with EPA on the determination that NOx BART for Power Boiler No. 1 is an emissions limitation of 207.4 lb NOx/hr limitation on a rolling 30-boiler-operating-day average for Power Boiler No. 1.

b. Power Boiler No. 2

For Power Boiler No. 2, FGR, OFA, MdN, ULNB, and SCR were considered to be technically infeasible. Domtar's 2014 BART analysis focused on LNB and SNCR. LNB is a combustion technology that uses an advanced burner design to reduce NOx formation and can achieve a

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control efficiency of up to twenty-five percent. For SNCR, two control-efficiency scenarios were evaluated: 27.5% and 35%.

i. Existing Controls in Use at the Source

Domtar did not identify any existing NOx controls on Power Boiler No. 2.

ii. Cost of Compliance

Cost-effectiveness for SNCR at Power Boiler No. 2 ranged from $1,909–$1,998/ton of NOx and cost-effectiveness for LNB was $1,951. Although the thirty-five percent control efficiency scenario for SNCR was the most cost-effective option, the technical feasibility of achieving that level of control at Power Boiler No. 2 is uncertain to due to the variability of steam demand and furnace temperature.

iii. Energy and Nonair Quality Environmental Impacts

No energy or nonair quality environmental impacts associated with SNCR were identified in Domtar's analysis.

iv. Remaining Useful Life

The remaining useful life for Domtar Power Boiler No. 2 is anticipated to be at least as long as the thirty-year life of the SNCR and LNB systems evaluated.

v. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from the various SNCR control efficiencies are included in Table 6-3 at page 6-3 of Domtar's 2014 BART analysis. SNCR at 27.5% control efficiency would be anticipated to improve visibility by 0.166 dv at Caney Creek Wilderness Area. LNB at thirty percent control efficiency would be anticipated to improve visibility by 0.181 dv at Caney Creek Wilderness Area. SNCR at thirty-five percent control efficiency would be anticipated to improve visibility by 0.212 dv.

vi. BART Requirements for NOx

Domtar proposed a NOx BART emissions limitation of 345 lb/hr based on a six percent decrease in NOx emissions considered achievable for Power Boiler No. 2 using SNCR or LNB. Domtar was uncertain whether the evaluated control efficiencies for LNB and SNCR were achievable based on unit-specific considerations for Power Boiler No. 2. EPA included this emissions limitation in the AR RH FIP and ADEQ concurs with this determination.

3. BART Requirements for PM

Power Boilers No. 1 and 2 are required to comply with maximum achievable control technology

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standards required under 40 C.F.R. part 63 subpart DDDDD—"National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial Commercial and Institutional Boilers and Process Heaters." Consistent with EPA's determination in the AR RH FIP, ADEQ concludes that it is unlikely that emission controls more stringent than MACT standards could be identified within reasonable cost-effectiveness parameters for BART. Therefore, ADEQ has determined that compliance with 40 C.F.R. part 63 subpart DDDDD is PM BART for Power Boilers No. 1 and No. 2.

4. Alternative to BART Requirements

On Month Day,2017, Domtar provided to ADEQ an additional option for consideration as an alternative to BART based on changing boiler operations as part of their planned transition from paper production to fluff pulp production. This alternative would result in greater visibility improvement than the emissions limitations included in the AR RH FIP and Paragraphs IV.C.1., 2., and 3. of this SIP revision. This option was modeled using emission rates for Power Boiler No. 1 based on combustion of natural gas and the following emissions limitations for Power Boiler No. 2: 435 lb/hour SO_2, 293 lb/hr NOx, and 81.6 lb/hr PM.

The RHR requires the following three elements for any alternative to BART:

(1) A demonstration that the emissions trading program or other alternative measure will achieve greater reasonable progress than would have resulted from the installation and operation of BART at all sources subject to BART in the State and covered by the alternative program.[13]
(2) A requirement that all necessary emissions reductions take place during the period of the first long-term strategy for regional haze.[14]
(3) A demonstration that the emissions reductions resulting from the alternative measure will be surplus to those reductions resulting from measures adopted to meet requirements of the CAA as of the baseline date of the SIP.[15]

In the xx technical support document included in Appendix B of this SIP, Domtar demonstrates that the proposed alternative would result in a visibility improvement of 0.349 dv at Caney Creek, the Class I area most impacted by Domtar, which is greater than the visibility improvement anticipated from all BART controls at Domtar (0.320 deciviews). [Insert language about other three wilderness areas.] The emissions reductions proposed are based on changes in operational scenarios for Domtar and are surplus to reductions required to meet other Clean Air Act requirements as of the 2000–2004 baseline of 2008 AR RH SIP, as revised by Arkansas. Therefore, compliance with the alternative to BART proposed by Domtar meets RHR requirements if compliance with the alternative to BART takes place during the period of the

[13] 40 CFR 51.308(e)(2)(i)
[14] 40 CFR 51.308(e)(2)(iii)
[15] 40 CFR 51.308(e)(2)(iv)

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first long-term strategy for regional haze (on or before December 31, 2018.)

Because the modeled visibility improvement of this option demonstrates better visibility improvement than continued operation of both Power Boiler No. 1 and No. 2 with the BART limitations included in this SIP, ADEQ has determined that as an acceptable alternative to the BART limitations described in Paragraphs IV.C.1., 2., and 3. of this SIP revision, Domtar may comply with the following emissions limitations listed in Table 4. AO LIS No. xx includes enforceable limitations and compliance dates consistent with this alternative to BART determination.

Table 4 Alternative to BART Emissions Limitations

Subject-to-BART Unit	SO_2	NOx	PM
Power Boiler No. 1	Satisfied by combusting only natural gas	Satisfied by combusting only natural gas	Satisfied by compliance with 40 C.F.R. part 63 subpart DDDDD
Power Boiler No. 2	435 lb/hr	293 lb/hr	Satisfied by compliance with 40 C.F.R. part 63 subpart DDDDD

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E. Entergy Arkansas, Inc. Lake Catherine Plant

Entergy provided a BART analysis (dated June 2013) for burning of natural gas at the Entergy Lake Catherine Generating Station. EPA used this analysis in the construction of the AR RH FIP and ADEQ has made its BART determination included in this SIP based on the analysis provided by Entergy. This analysis is provided in Appendix C of this SIP and summarized below.

Entergy Lake Catherine Plant Unit 4 is a 558 megawatt tangentially-fired boiler installed in 1970. Entergy Lake Catherine Plant Unit 4 has a maximum heat input of 5,850 MMBtu/hr. Entergy Lake Catherine Plant Unit 4 burns pipeline quality natural gas and is capable of burning No. 6 fuel oil as a secondary fuel, although Entergy has committed to not burning fuel oil at this unit. Therefore, emissions from fuel oil were not considered in the BART analysis and the Entergy Lake Catherine Plant Unit 4 must not burn fuel oil until BART determinations are promulgated for this unit for SO_2, NO_X, and PM for the fuel oil firing scenario through EPA action upon and approval of revised BART determinations submitted by the State as a SIP revision. Entergy Lake Catherine Plant Unit 4 meets the BART-eligibility criteria. Also, ADEQ determined, based on results of previous air dispersion modeling, that the Entergy Lake Catherine Plant Unit 4 contributes an existing visibility impairment of greater than 0.5 dv in at least one Class I area. Therefore, Entergy conducted a complete BART analysis and identified the Entergy Lake Catherine Plant Unit 4 source as the sole Entergy Lake Catherine unit subject

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to BART. Consequently, the five BART statutory factors were considered for Entergy Lake Catherine Plant Unit 4.

1. BART Requirements for SO_2

A BART determination for SO_2 based on the use of natural gas was included in the 2008 AR RH SIP and approved in EPA's March 12, 2012, final rule (77 FR 14604). The determination resulted in no SO_2 controls needed during natural gas combustion. Because Entergy has committed to not burning fuel oil, no changes are needed to EPA's determinations with respect to the previously approved SO_2 BART limitations included in Regulation No. 19 because this limitation has been rendered enforceable through an AO included with this SIP revision.

2. BART Requirements for PM

A BART determination for PM at Lake Catherine Plant Unit 4 based on the use of natural gas was included in the 2008 AR RH SIP and approved in EPA's March 12, 2012, final rule (77 FR 14604). The determination resulted in no PM controls needed during natural gas combustion. Because Entergy has committed to not burning fuel oil, no changes are needed to EPA's determinations with respect to the previously approved PM BART limitation included in Regulation No. 19 because the limitation has been rendered enforceable through an AO included with this SIP revision.

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F. Entergy Arkansas, Inc. White Bluff

At the request of ADEQ, Entergy provided an updated BART five-factor analysis for SO_2 for White Bluff (dated August 18, 2017) to supplement previous BART analyses (dated February 2013, October 2013, August 2015, and August 2016) submitted to EPA for their consideration in development of the AR RH FIP. This updated analysis provides new information in light of an updated remaining useful life for White Bluff and evaluates three new control scenarios. Entergy also provided to ADEQ supplemental information on April 5, 2017 detailing cost-effectiveness for dry FGD with various remaining useful life assumptions. ADEQ makes its BART determination included in this SIP based on the updated BART five-factor analysis for SO_2 and previous BART analyses and supplemental information provided by Entergy, and analyses from other stakeholders of interest. These analyses are incorporated by reference and provided in Appendix D of this SIP.

Entergy White Bluff Units 1 and 2 are identical tangentially-fired 850 megawatt boilers, which were installed in 1974, and they have a maximum heat input capacity of 8,950 MMBtu/hr each. These units are currently equipped with electrostatic precipitators (ESPs) to control PM emissions. Entergy White Bluff Units 1 and 2 burn sub-bituminous coal as a primary fuel and burn No. 2 fuel oil or biofuel as a start-up fuel. Entergy White Bluff also has a rarely used 183

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MMBtu/hr auxiliary boiler that burns only No. 2 fuel oil or biodiesel. Entergy White Bluff Units 1 and 2 and the auxiliary boiler meet the BART eligibility criteria. Because modeling demonstrates that the auxiliary boiler's greatest impact on visibility at any Class 1 area is only 0.01 dv, EPA determined that existing emissions limitations for the auxiliary boiler in Entergy's permit satisfy BART for SO_2, NOx, and PM. ADEQ concurs with this determination. Entergy White Bluff Units 1 and 2 contribute greater than 0.5 dv to at least one Class I area. Consequently, the five BART statutory factors were considered for Entergy White Bluff Units 1 and 2.

1. Summary of BART Analyses for SO_2

The available SO_2 retrofit control technology options for White Bluff Units 1 and 2 include: fuel switching to lower sulfur coal, dry sorbent injection (DSI), spray dryer absorber (SDA), circulating dry scrubber (CDS), and Wet FGD. All evaluated options were considered technically feasible.

Fuel switching to coal with a sulfur content of 0.6 lb/MMBtu would result in an 8.75% reduction in SO_2 emissions from baseline levels.

DSI, which is the injection of sorbent into the exhaust gas stream, has a control efficiency that can range from forty to ninety percent based on sorbent particle size, residence time, temperature, and particulate collection equipment. Entergy evaluated two particulate collection methods for DSI at Entergy White Bluff. The first collection method would require retrofits to the currently installed ESP and would achieve a fifty percent SO_2 removal efficiency. The second "enhanced" collection method would require the installation of a baghouse and would achieve an eighty percent SO_2 removal efficiency. Both evaluated DSI technologies would require landfilling of DSI waste

SDA and CDS, both semi-dry scrubbing (Dry FGD) systems, have control efficiencies ranging from sixty to ninety-five percent. Both systems utilize a fine mist of lime slurry sprayed into an absorption tower to absorb SO_2. The resulting calcium sulfite and calcium sulfate are then collected with a fabric filter.

Wet FGD, scrubbing the exhaust gas stream with a lime or limestone slurry, is capable of achieving eighty to ninety-five percent control of SO_2 emissions. This option was eliminated in previous analyses and in the AR RH FIP due to the small incremental difference in visibility improvement between Wet FGD and Dry FGD relative to the marginal cost difference.

a. Existing Controls in Use at the Source

The current permitted emissions rate for Units 1 and 2 at Entergy White Bluff is 1.2 lb SO_2/MMBtu based on the new source performance standard for fossil-fuel fired steam generators. Entergy White Bluff is currently using lower sulfur content coal to minimize costs of compliance with the Acid Rain Program. Using low sulfur coal, Entergy White Bluff has been able to achieve monthly average emissions rates below 0.69 SO_2/MMBtu.[16] The average monthly

[16] Calculated using 2014–2016 monthly SO_2 emissions and heat rate (MMBtu) obtained from the Air Markets

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emissions rate between 2014 and 2016 was 0.55 lb SO_2/MMBTU for Unit 1 and 0.58 lb SO_2/MMbtu for Unit 2. Consequently, Entergy White Bluff has already lowered its visibility impact on potentially impacted federal Class I areas during this planning period beyond what would be expected due to emissions at its permitted emissions rate.

b. Cost of Compliance

The cost of compliance differs among the control technologies evaluated. For some technologies, remaining useful life is a significant factor in determining annual cost. The cost of fuel switching to low sulfur coal is not dependent on the remaining useful life of White Bluff Units 1 and 2 or equipment because no capital investments in equipment are required. Switching to low sulfur coal entails an increased annual cost of operation based on purchase contract terms for the specific sulfur content of the coal. Entergy estimates an increase in operation and maintenance costs based on a $0.50 per ton cost premium to guarantee that the sulfur content of coals is less than 0.6 lb/MMBtu. Thus, the cost-effectiveness for low sulfur coal is approximately $1,150 per ton of SO_2 reduced. The other evaluated control technologies require capital investments in new equipment or retrofit of existing equipment. These capital investments are amortized over the remaining useful life of White Bluff Units 1 and 2 to determine the annual cost-effectiveness of SO_2 emissions reductions. The remaining useful life assumptions are discussed in section IV(E)(1)(d) below. In Entergy's August 18, 2017 revised BART analysis, Entergy redacted certain information held to be a trade secret, including capital costs, remaining useful life, and average cost-effectiveness for DSI, Enhanced DSI, and Dry FGD. They did provide baseline and controlled emission rates, annual cost-effectiveness for low sulfur coal, and incremental cost-effectiveness values of control technologies versus low sulfur coal without redaction. Using these data provided without redaction by Entergy, ADEQ was able to calculate the average cost-effectiveness of each technology. The average cost-effectiveness of DSI is approximately 7,144 per ton and the average cost-effectiveness of "enhanced" DSI is approximately 7,346 per ton. Average cost-effectiveness of Dry FGD systems is approximately7,101 per ton. Cost-effectiveness of Wet FGD was not calculated in the updated five factor analysis because EPA already determined in the AR RH FIP that Wet FGD is not BART because Wet FGD is more expensive than Dry FGD technologies with a 0.028 dv or less incremental impact at Class I areas. The incremental cost of Wet FGD would be even greater considering the updated remaining useful life for Entergy White Bluff Units 1 and 2.

The cost-effectiveness estimates for all control options evaluated, with the exception of low sulfur coal, are greater than what is typically considered cost-effective. Based on these cost-effectiveness estimates, ADEQ concludes that DSI, Dry FGD, and Wet FGD are not BART.

c. Energy and Nonair Quality Environmental Impacts

Entergy indicated that there were energy and adverse nonair quality environmental impacts associated with add-on controls under consideration, such as DSI and Dry FGD. These impacts were factored into costs of compliance.

d. Remaining Useful Life

In the August 18, 2017 updated BART analysis for White Bluff, Entergy amortized costs based

Program Database https://ampd.epa.gov/ampd/

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on their proposal regarding coal-fired operations.[17][18] The August 18, 2017 analysis redacted Entergy's proposed date; however, the cost-effectiveness for Dry FGD included in the August 18, 2017 analysis corresponds to Dry FGD cost-effectiveness estimates provided in Entergy's April 21, 2017 letter based on a seven-year to eight-year remaining useful life scenario.[19] In comments on the AR RH FIP, Entergy also proposed dates as part of a "multi-unit plan to improve visibility and to better manage generation assets for reliability and costs."[20] In those comments, Entergy proposed to "take an enforceable limit" regarding their proposal regarding coal-fired operations.[21]

. Under the guidelines for BART determinations, the remaining useful life calculation should begin on "the date that controls will be put in place" (compliance date) and ending on "the date the facility permanently stops operations."[22] Based on the controls evaluated, the compliance date for controls would be as expeditiously as practicable, but in no event later than five years after approval of the SIP. The guidelines further specify that the permanent operations cessation date should be "assured by a federally- or State-enforceable restriction preventing further operation."[23] Therefore, ADEQ agrees that Entergy's cost-effectiveness calculations are reasonable based on a remaining useful life of seven years and Entergy's proposal to take an enforceable limit regarding coal-fired operations date. [24]Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated technologies are included in Tables 4-6 and 4-7 of Entergy's August 18, 2017 analysis at pages 4-7 and 4-8. Based on remaining useful life, DSI, Dry FGD, and Wet FGD were eliminated as BART for SO_2. The remaining evaluated option, switching to low sulfur coal, would result in a 0.129 dv improvement at Caney Creek Wilderness Area and a 0.143 dv improvement at Upper Buffalo Wilderness Area.

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f. BART Requirements for SO_2

Based on their analysis, Entergy proposed that BART to control SO_2 emissions from Entergy White Bluff Units 1 and 2 was low sulfur coal with a required emissions rate of 0.6 lb/MMBtu calculated as a 30-day rolling average over each boiler operating day. ADEQ concurs with this determination.

AO LIS No. xx includes enforceable limitations and compliance dates consistent with ADEQ's

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[19] In the April 21, 2017 letter included in Appendix D, Entergy estimates that "for a seven- to eight-year [remaining useful life], the cost-effectiveness range in dollars per ton of SO_2 emissions reduced is approximately $6,500–$7,200 based on the full costs and $5,000-$5,500 based on partial costs."

[20] Entergy Arkansas Inc. Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas, at 5 (Aug. 7, 2015) (Docket ID No. EPA-R06-OAR-2015-0189-0153) (hereinafter "EAI Comments").

[21] Id.

[22] 70 FR 39104

[23] Id.

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determination.

2. BART Requirements for PM

A BART determination for PM for Entergy White Bluff Units 1 and 2 was included in the 2008 AR RH SIP and approved in EPA's March 12, 2012, final rule (77 FR 14604). No changes are needed to EPA's determinations with respect to previously approved PM BART limitations (0.10 lb/MMBtu) included in Regulation No. 19 because these limitations have been rendered enforceable through an AO included with this SIP revision.

G. Southwest Electric Power Company Flint Creek Power Plant

SWEPCO, a subsidiary of AEP, provided a BART analysis (dated September 2013, Version 4) for the Flint Creek Power Plant. EPA used this analysis in the development of the AR RH FIP and ADEQ has made its BART determination included in this SIP based on the analysis provided by SWEPCO. This analysis is provided in Appendix E of this SIP and summarized below.

SWEPCO Flint Creek Plant Boiler No. 1 is a 558 megawatt dry bottom wall-fired boiler that commenced operation in 1978. SWEPCO Flint Creek Plant Boiler No. 1 has a maximum heat input of 6,324 MMBtu/hr. SWEPCO Flint Creek Plant Boiler No. 1 is equipped with Dry FGD with a Pulse Jet Fabric Filter (PJFF) and Activated Carbon Injection (ACI). SWEPCO Flint Creek Plant Boiler No. 1 burns low sulfur western coal as a primary fuel, but can also combust fuel oil and tire-derived fuels. Fuel oil firing is only allowed during unit startup and shutdown, during startup and shutdown of pulverizer mills, for flame stabilization when coal is frozen, for No. 2 fuel oil tank maintenance, to prevent boiler tube failure in extreme cold weather when the unit is offline for maintenance, and during malfunction. SWEPCO Flint Creek Plant Boiler No. 1 meets the BART-eligibility criteria. Also, based on results of air dispersion modeling, the SWEPCO Flint Creek Plant Boiler No. 1 contributes greater than 0.5 dv to visibility impairment in at least one Class I area. Consequently, the five BART statutory factors were considered for SWEPCO Flint Creek Plant Boiler No. 1.

1. Summary of BART Analysis for SO_2

The available SO_2 retrofit control technology options include DSI, Dry FGD, and Wet FGD. DSI, a form of FGD, has a control efficiency of forty to sixty percent and was considered technically feasible in SWEPCO's BART analysis for the SWEPCO Flint Creek Plant Boiler No. 1. A Dry FGD was also deemed a technically feasible option and has a control efficiency of sixty to ninety-five. Novel integrated deacidification (NID), a form of Dry FGD, was predicted to have an achievable ninety-two percent control efficiency on the SWEPCO Flint Creek Plant Boiler No. 1. Wet FGD was also considered a technically feasible option and has an eighty to ninety-five percent control efficiency.

a. Existing Controls in Use at the Source

At the time SWEPCO performed a BART analysis, no SO_2 controls were in place at Flint Creek

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Plant Boiler No. 1. Since that time, SWEPCO has installed an NID system to comply with SO_2 BART requirements included in the AR RH FIP. Cost-effectiveness and visibility improvement data included in SWEPCO's BART analysis are based on the 2001–2003 baseline, not current SO_2 controls in place at Flint Creek Plant Boiler No. 1.

b. Cost of Compliance

SWEPCO determined the cost effectiveness of a Wet FGD at an SO_2 rate of 0.04 lb/MMBtu (ninety-five percent control of baseline emissions) is $4,919 per ton of SO_2 removed, while cost effectiveness of a NID system at an SO_2 rate of 0.06 lb/MMBtu (ninety-two percent control of baseline emissions) is $3,845 per ton of SO_2 removed. Because technologies with higher control efficiencies were within the range considered cost-effective, the costs of DSI were not evaluated.

c. Energy and Nonair Quality Environmental Impacts

SWEPCO concluded that although Wet FGD was expected to achieve a slightly higher level of SO_2 control compared to NID technology, a negative energy or nonair quality impact associated with Wet FGD was the generation of large volumes of wastewater and solid waste/sludge that must be treated. Also, Wet FGD systems have increased power requirements and increased reagent usage over Dry FGD, as well as the potential for increased particulate and sulfuric acid mist releases.

d. Remaining Useful Life

The remaining useful life of SWEPCO Flint Creek Plant Boiler No. 1 does not impact the annualized capital costs because the useful life of the unit is anticipated to be at least as long as the capital cost recovery period.

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e. Degree of Visibility Improvement as a Result of Controls

Visibility improvements that would be anticipated from evaluated control technologies are included in Table 5-7 on page 5-9 of SWEPCO's 2013 BART analysis. Operation of NID at SWEPCO Flint Creek Plant Boiler No. 1 will result in up to a 0.647 dv improvement to the existing visibility impairment and Wet FGD does not add additional visibility improvement over Dry FGD because Wet FGD results in other visibility impairing emissions.

f. BART Requirements for SO_2

SWEPCO proposed that BART to control SO_2 emissions from SWEPCO Flint Creek Plant Boiler No. 1 was NID technology with an expected emissions rate of 0.06 lb/MMBtu calculated as a 30-day rolling average over each boiler operating day. ADEQ concurs with this determination.

AO LIS No. xx includes enforceable limitations and compliance dates consistent with ADEQ's BART determination.

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2. BART Requirements for PM

A BART determination for PM based on the existing ESP controls was included in the 2008 AR RH SIP and approved in EPA's March 12, 2012, final rule (77 FR 14604). This determination also approved the existing PM emissions rate of 0.10 lb/MMBtu. ADEQ proposes that no changes are needed to EPA's determination with respect to the previously approved PM BART limit included in Regulation No. 19 because this limitation has been rendered enforceable through an AO LIS No. XX included with this SIP revision.

V. Reasonable Progress Analysis for Arkansas Class I Areas

The 1999 RHR requires states to establish RPGs for each Class I area within the state. These goals must ensure reasonable progress consistent with the URP necessary to achieve natural visibility conditions by 2064 on the twenty percent worst days and no degradation on the twenty percent best days. The URP is also referred to as the "glidepath." In establishing RPGs, the RHR requires states to consider four factors: (1) cost of compliance, (2) the time necessary for compliance, (3) the energy and nonair quality environmental impacts of compliance, and (4) the remaining useful life of potentially affected sources. If a state determines that additional progress beyond what is necessary to achieve the URP is reasonable, the RHR rule states that "the State should adopt that amount of progress as its goal for the first-long-term strategy." The RHR also requires states to provide a demonstration as part of the SIP if the State determines that the URP needed to reach natural conditions is not reasonable. In its 2007 reasonable progress guidance, EPA states that the "glidepath is not a presumptive limit and states may establish an RPG that provides for greater, lesser, or equivalent visibility improvement as that described by the glidepath."[25] The guidance also instructs the states in the following manner:

> In deciding what amount of emissions reduction is appropriate in setting the RPG, you should take into account the fact that the long-term goal of no manmade impairment encompasses several planning periods. It is reasonable for you to defer reductions to later planning periods in order to maintain a consistent glidepath toward the long-term goal.[26]

In the 2008 AR RH SIP, ADEQ established a URP for Caney Creek and Upper Buffalo Wilderness Areas based on the progress needed to reach natural conditions by 2064 in each area. The 2008 AR RH SIP established RPGs based on a combination of mandated controls, including BART requirements, and demonstrated that these measures would provide for a rate of progress that improves visibility conditions on the worst days at a rate that surpasses the URP and would prevent degradation on the best days. ADEQ reasoned that no four factor analysis was required because the State determined that no additional controls were necessary to ensure reasonable

[25] Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program
[26] *Id.*

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progress toward natural visibility by 2064 beyond those controls required for sources subject to BART requirements. Therefore, the 2008 AR RH SIP did not include a four factor analysis.

In 2012, EPA issued a partial approval and a partial disapproval of the 2008 AR RH SIP. In this action, EPA approved the URP, but disapproved the RPGs. In justifying its disapproval of Arkansas's RPGs, EPA asserted that the URP does not establish a "safe harbor" for the State in setting its RPGs and that Arkansas should have performed a four factor analysis and determined whether additional progress would be reasonable.[27] This submittal addresses EPA's disapproval of the reasonable progress analysis included in the 2008 AR RH SIP by considering key pollutants that contribute to visibility impairment in Arkansas Class I areas and using the four factors to assess whether controls on sources that are not subject to BART are reasonable.

B. Identification of Key Pollutants and Source Categories That Contribute to Visibility Impairment in Arkansas Class I Areas

Included with the 2008 AR RH SIP, ADEQ provided emissions and air quality modeling performed by Central Regional Air Planning Association (CENRAP) in support of SIP development in the central states region.[28] As part of this modeling, the Particulate Source Apportionment Technology Tool (PSAT), included with CAMx Version 4.4, was used to provide source apportionment by geographic regions and major source categories for pollutants that contribute to visibility impairment at each of the Class I areas in the central states region.[29] The PSAT results demonstrate that sulfate (SO_4) from point sources is the principle driver of light extinction at both Arkansas Class I areas on the twenty percent worst days.

1. Regional Particulate Source Apportionment for Caney Creek and Upper Buffalo Wilderness Areas

Table 5 shows the modeled relative contributions to light extinction for each source category at Caney Creek and Upper Buffalo Wilderness Areas on the twenty-percent worst days in 2002. Point sources, responsible for approximately sixty percent of total light extinction at each Arkansas Class I area, are the primary contributor to light extinction on the twenty percent worst days. Area sources are the next largest contributor to light extinction at Arkansas Class I areas; however, area sources only contribute thirteen percent and sixteen percent of total light extinction at Caney Creek and Upper Buffalo Wilderness Areas, respectively. The other source categories each contribute between two percent and six percent of total light extinction at Arkansas Class I areas.

[27] Approval and Promulgation of Implementation Plans; Arkansas Regional Haze State Implementation Plan; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze: Proposed Rule (76 FR 64195)

[28] The central states region includes Texas, Oklahoma, Louisiana, Arkansas, Kansas, Missouri, Nebraska, Iowa, Minnesota; and tribal governments included in these states.

[29] August 27, 2007 CENRAP PSAT tool: W20% Projected Bext;

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Table 5 Modeled Light Extinction for the 20% Worst Days at Caney Creek and Upper Buffalo Wilderness Areas in 2002 (Mm^{-1})

	Point	Natural	On-Road	Non-Road	Area
Caney Creek	81.04	2.45	7.26	7.31	17.81
Upper Buffalo	77.8	2.39	6.62	7.72	20.46

Figure 2 and Figure 3 show the modeled relative contributions to light extinction for each species and source category at Caney Creek and Upper Buffalo Wilderness Areas on the twenty percent worst days in 2002. According to the 2002 PSAT results, SO_4 contributed approximately sixty-five percent and sixty-three percent of modeled light extinction at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2002. The point source category contributed eighty-six percent and eighty-seven percent of light extinction due to SO_4 at Caney Creek and Upper Buffalo, respectively, on the twenty percent worst days. The other source categories contribute much smaller proportions of light extinction due to SO_4. In fact, point sources of SO_4 contributed fifty-five to fifty-six percent of total light extinction at Arkansas Class I areas. By contrast, nitrate (NO_3) contributed approximately ten percent, primary organic aerosols (POA) contributed approximately eight percent, elemental carbon (EC) contributed approximately four percent, and soil contributed approximately one percent of modeled light extinction at both wilderness areas in 2002 on the twenty percent worst days. Crustal material (CM) contributed approximately three percent and five percent of modeled light extinction at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days. Relative contributions from on-road and point sources each represent approximately a third of light extinction attributed to NO_3. Area sources were the primary driver of light extinction attributed to POA, soil, and CM. Light extinction attributed to EC is primarily driven by non-road and area sources.

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Figure 2 Modeled Light Extinction for the 20% Worst Days at Caney Creek Wilderness Area in 2002

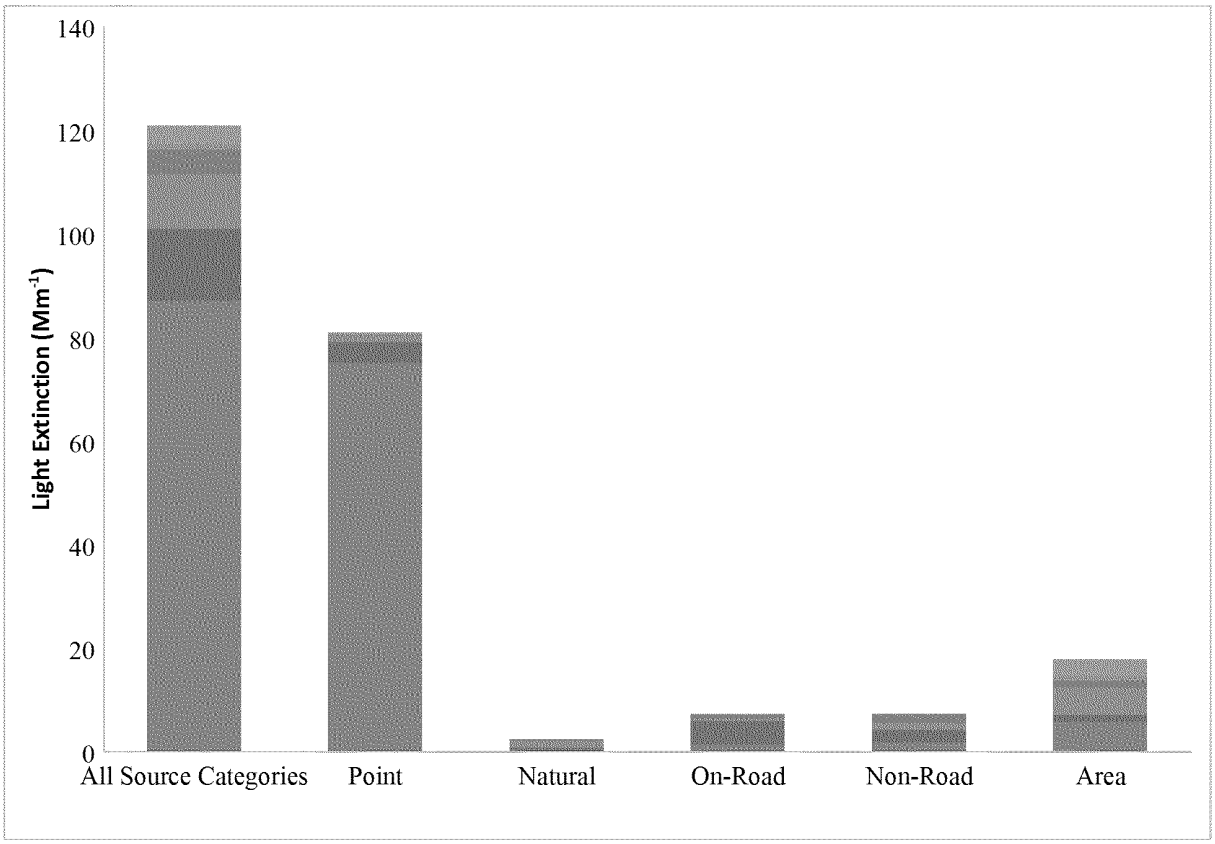

Figure 3 Modeled Light Extinction for the 20% Worst Days at Upper Buffalo Wilderness Area in 2002

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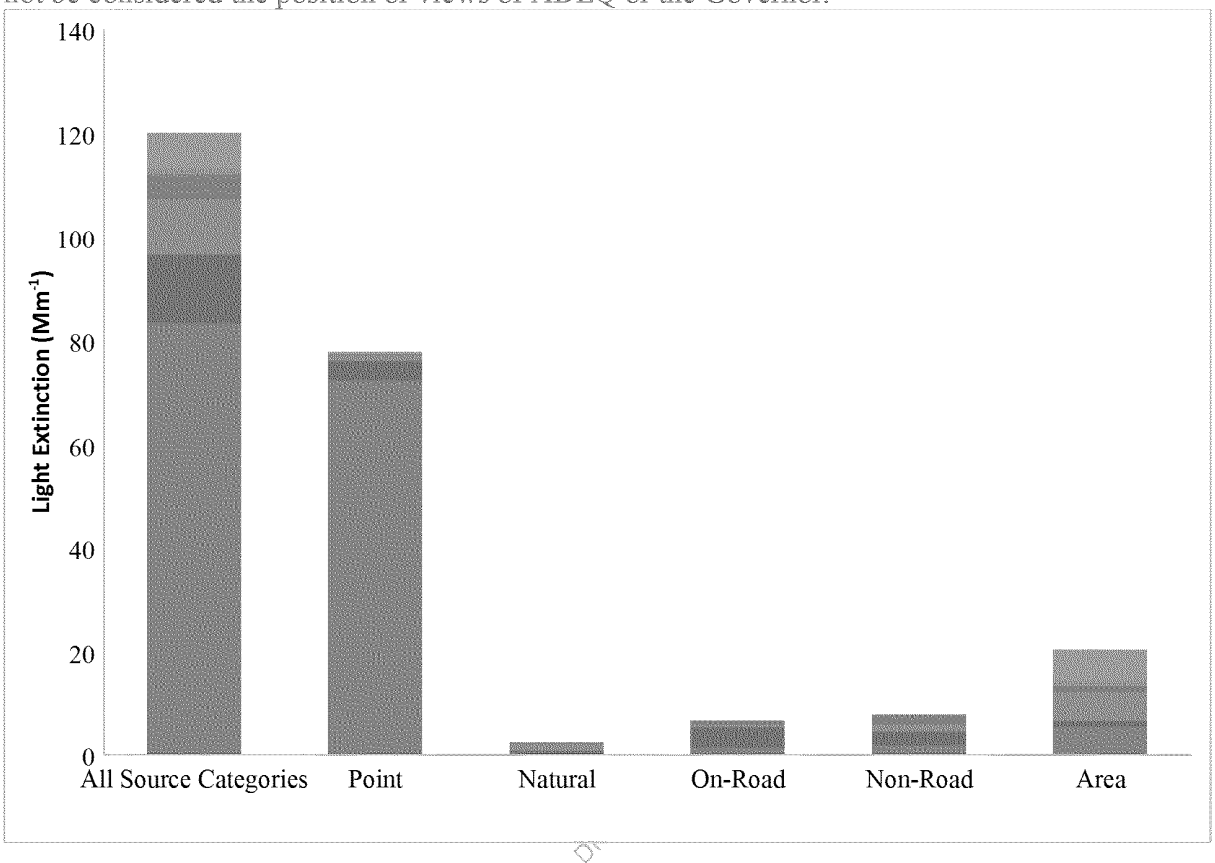

Table 6 shows the modeled relative contributions to light extinction for each source category at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2018. Point sources are projected to remain the primary contributor to light extinction at Arkansas Class I areas. Point sources are projected to contribute approximately fifty-three percent of total light extinction at Caney Creek and fifty percent of total light extinction at Upper Buffalo on the twenty percent worst days in 2018. Area sources are also projected to continue to be the second largest contributor to light extinction with contributions of twenty percent of total light extinction at Caney Creek and twenty-three percent of total light extinction at Upper Buffalo on the twenty percent worst days in 2018. Natural, on-road, and non-road sources are projected to continue to contribute a very small portion of total light extinction at Arkansas Class I areas on the twenty percent worst days in 2018.

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Table 6 Modeled Light Extinction for the 20% Worst Days at Caney Creek and Upper Buffalo Wilderness Areas in 2018 (Mm^{-1})

	Point	Natural	On-Road	Non-Road	Area
Caney Creek	45.27	2.12	1.44	3.76	16.96
Upper Buffalo	43.02	2.24	1.57	4.25	19.71

Figure 4 and Figure 5 show the modeled relative contributions to light extinction for each species and source category at Caney Creek and Upper Buffalo Wilderness Areas on the twenty percent worst days in 2018. According to the regional PSAT data, light extinction attributed to SO_4 is projected to decrease on the twenty percent worst days by forty-four percent at Caney Creek and by forty-five percent at Upper Buffalo between 2002 and 2018; however, SO_4 is projected to continue to be the primary driver of total light extinction. The 2018 projections show that point sources will continue to be the primary source of light extinction due to SO_4. Point sources of SO_4 are projected to contribute forty-three to forty-six percent of total light extinction on the twenty percent worst days in 2018 in Arkansas Class I areas. The other species are also projected to see reductions in their contribution to total light extinction; however, their relative contributions to total light extinction during 2018 remain much smaller than that of SO_4. Light extinction on the twenty percent worst days attributed to NO_3 from on-road sources is projected to decrease more rapidly than light extinction attributed to NO_3 from point sources; however, point sources of NO_3 will only contribute three to four percent of total light extinction at Arkansas Class I areas on the twenty percent worst days based on 2018 projections.

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Figure 4 Modeled Light Extinction for the 20% Worst Days at Caney Creek Wilderness Area in 2018 (Mm^{-1})

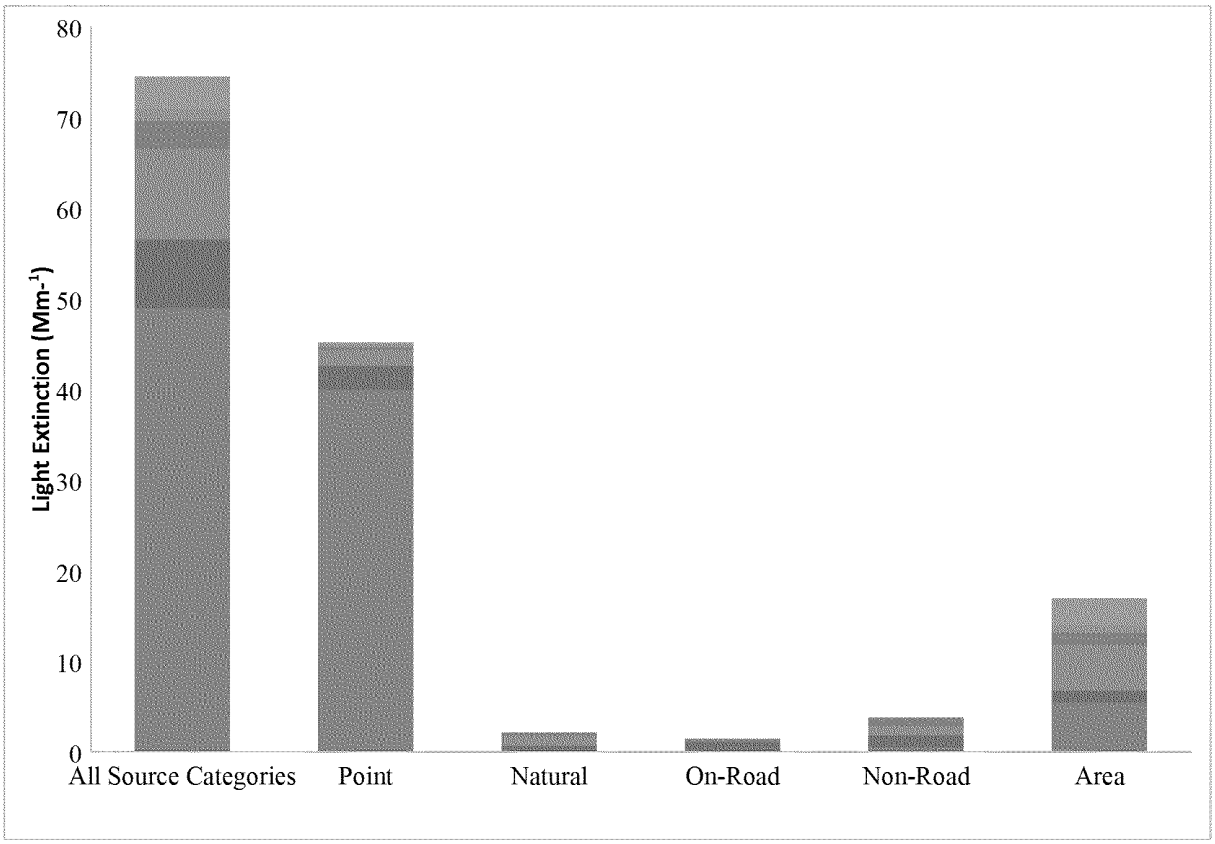

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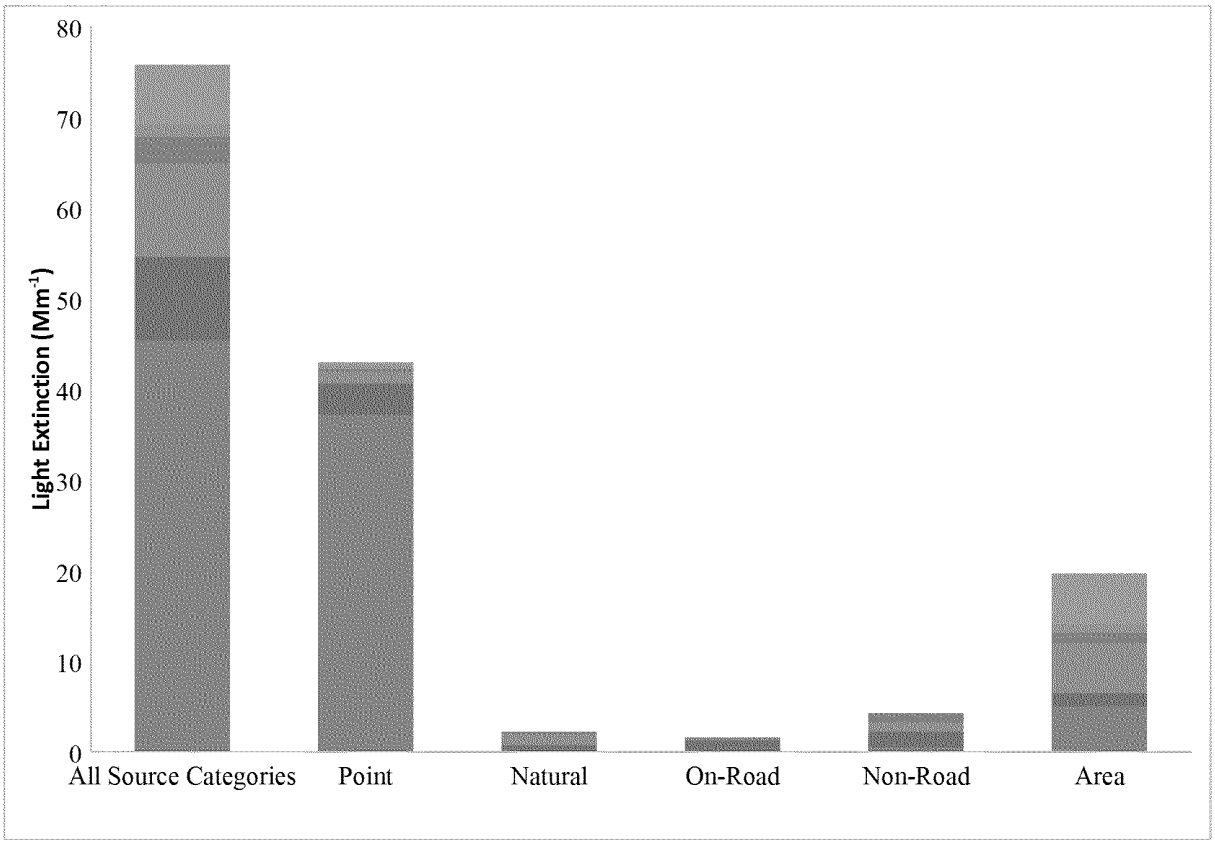
Figure 5 Modeled Light Extinction for the 20% Worst Days at Upper Buffalo Wilderness Area in 2018 (Mm^{-1})



2. Arkansas Particulate Source Apportionment for Caney Creek and Upper Buffalo Wilderness Areas

The relative contribution of sources within Arkansas to total light extinction on the twenty percent worst days at both Arkansas Class I areas is small. Species attributed to Arkansas sources contributed approximately ten percent of total light extinction on the twenty percent worst days in Arkansas Class I areas according to 2002 data and are projected to contribute between thirteen and fourteen percent of total light extinction on the twenty percent worst days in Arkansas Class I areas in 2018. Total light extinction is projected to decrease by thirty-five percent on the twenty percent worst days at Arkansas Class I areas between 2002 and 2018. Light extinction on the twenty percent worst days attributed to species from Arkansas sources is projected to decrease by seventeen percent at Caney Creek and to decrease by eleven percent at Upper Buffalo between 2002 and 2018.

Table 7 shows the relative contributions of sources within Arkansas to light extinction for each source category at Caney Creek and Upper Buffalo Wilderness Areas on the twenty percent

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worst days in 2002. Area sources had a larger impact on light extinction than did point sources when only sources within Arkansas were considered. On the twenty percent worst days in 2002, area sources contributed approximately thirty-seven percent of light extinction attributed to Arkansas sources (four percent of total light extinction) at Caney Creek and fifty percent of light extinction attributed to Arkansas sources (five percent of total light extinction) at Upper Buffalo. Point sources contributed approximately twenty-eight percent of light extinction attributed to Arkansas sources (three percent of total light extinction) at Caney Creek and twenty-four percent of light extinction attributed to Arkansas sources (two percent of total light extinction) at Upper Buffalo on the twenty percent worst days. The other sources in Arkansas contributed between seven and fourteen percent each to light extinction attributed to Arkansas sources (approximately one percent each to total light extinction) at Arkansas Class I areas on the twenty percent worst days in 2002.

Table 7 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Caney Creek and Upper Buffalo Wilderness Areas in 2002 (Mm^{-1})

	Point	Natural	On-Road	Non-Road	Area
Caney Creek	3.85	1.1	1.88	1.72	5.03
Upper Buffalo	3.25	0.94	1.29	1.26	6.72

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Figure 6 and Figure 7 show the relative contributions of sources within Arkansas to light extinction for each source category and species at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2002. SO_4 from Arkansas sources contributed approximately three percent of total modeled l extinction at Caney Creek and Upper Buffalo Wilderness Areas in 2002 on the twenty percent worst days. The point source category contributed approximately two thirds of the light extinction attributed to SO_4 from Arkansas sources at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2002. POA from Arkansas sources contributed approximately three percent and two percent of total light extinction on the twenty percent worst days at Caney Creek and Upper Buffalo Wilderness Areas, respectively. Area sources were the primary driver of light extinction due to POA. NO_3 from Arkansas sources contributed approximately two percent and one percent to light extinction at Caney Creek and Upper Buffalo Wilderness Areas on the twenty percent worst days, respectively. On-road sources accounted for approximately fifty percent of the light extinction at Arkansas Class I areas attributed to Arkansas NO_3 sources. EC from Arkansas sources contributed approximately one percent and soil from Arkansas sources contributed approximately 0.2% to total light extinction at both Arkansas Class I areas on the twenty percent worst days. Attribution to light extinction from Arkansas sources of EC was split primarily among on-road, non-road, and area sources. Light extinction from Arkansas sources of soil was primarily attributed to area sources. CM from Arkansas sources, primarily area sources, contributed approximately one and two percent of total light extinction and Caney Creek and

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Upper Buffalo Wilderness Areas, respectively.

Figure 6 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Caney Creek Wilderness Area in 2002 (Mm^{-1})

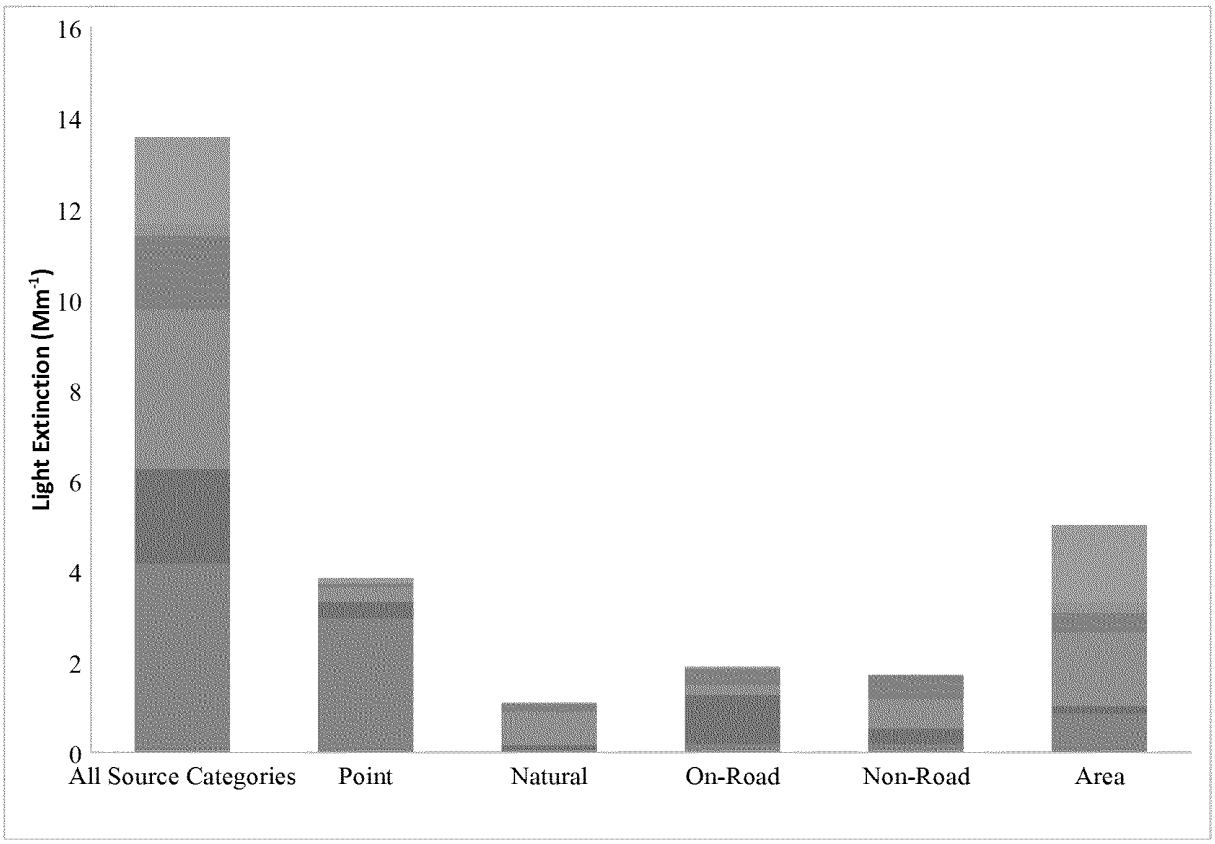

Figure 7 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Upper Buffalo Wilderness Area in 2002 (Mm^{-1})

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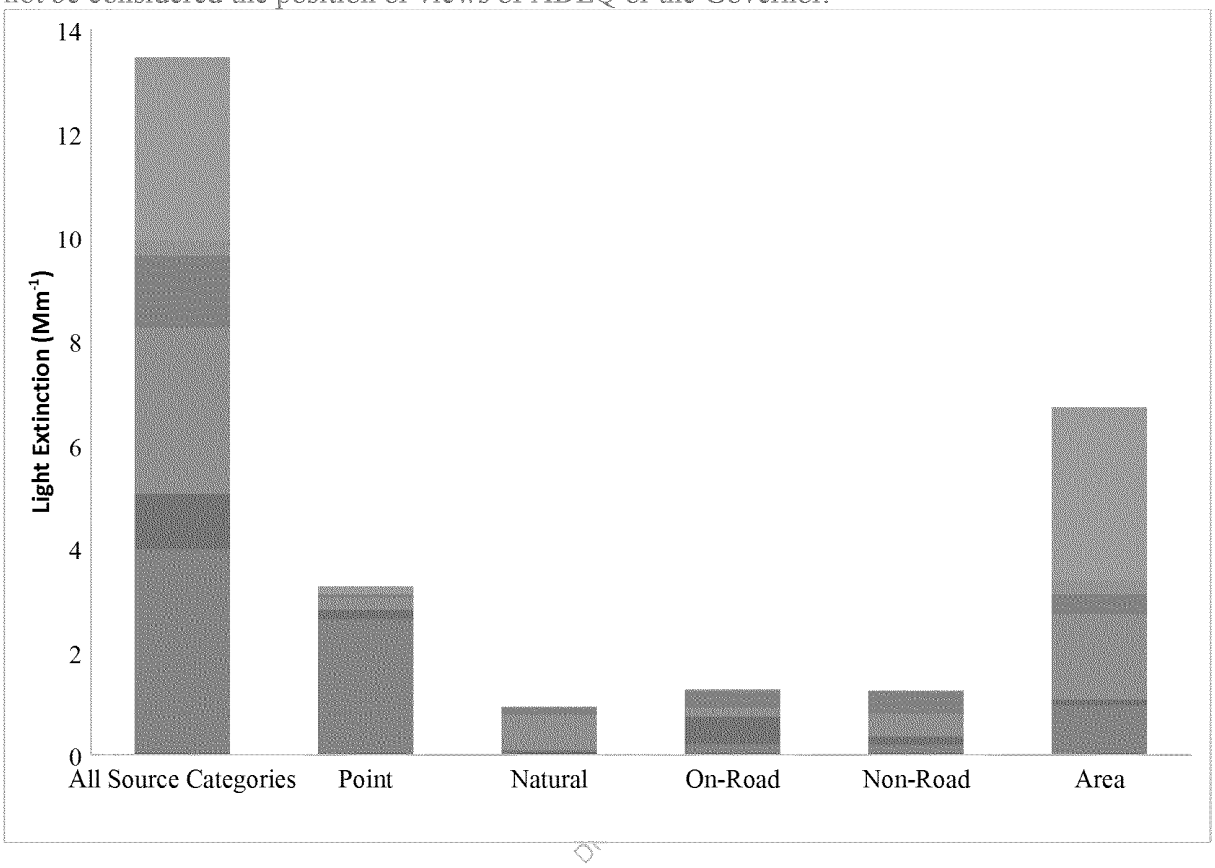

Table 8 shows the relative contributions of sources within Arkansas to light extinction for each source category at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2018. Area sources are projected to continue to have a larger impact on light extinction than do point sources when only sources located in Arkansas are considered. Area sources are projected to contribute approximately forty-three percent of light extinction attributed to Arkansas sources (six percent of total light extinction) at Caney Creek and fifty-four percent of light extinction attributed to Arkansas sources (eight percent of total light extinction) at Upper Buffalo. Point sources are projected to contribute approximately thirty-six percent of light extinction attributed to Arkansas sources (five percent of total light extinction) at Caney Creek and thirty percent of light extinction attributed to Arkansas sources (four percent of total light extinction) at Upper Buffalo. The other sources in Arkansas are projected to contribute between two percent and nine percent each to light extinction from Arkansas sources (0.3–1.2% of total light extinction) at Arkansas Class I areas on the twenty percent worst days in 2018.

Table 8 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at

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Caney Creek and Upper Buffalo Wilderness Areas in 2018 (Mm^{-1})

	Point	Natural	On-Road	Non-Road	Area
Caney Creek	4.05	1.04	0.35	0.95	4.85
Upper Buffalo	3.63	0.91	0.3	0.66	6.52

Figure 8 and Figure 9 show the relative contributions of sources within Arkansas to light extinction for each species and source category at Caney Creek and Upper Buffalo Wilderness Areas, respectively, on the twenty percent worst days in 2018. According to the PSAT data for Arkansas sources, light extinction attributed to Arkansas NO_3 sources is projected to decrease by sixty-two percent at Caney Creek and by forty-one percent at Upper Buffalo. This projected decrease is largely due to a decrease in light extinction attributed to NO_3 from Arkansas on-road sources. Overall light extinction attributed to Arkansas sources of SO_4 are projected to decrease at Arkansas Class I areas; however, light extinction attributed to point sources of SO_4 located in Arkansas is projected to increase by four percent at Caney Creek and five percent at Upper Buffalo on the twenty percent worst days. Nevertheless, the contribution to total light extinction of SO_4 from Arkansas point sources remains relatively small—three percent of total light extinction at each Arkansas Class I area. Light extinction due to Arkansas sources of POA, EC, and CM are also projected to decrease. Light extinction due to Arkansas sources of soil is projected to increase; but, soil will remain the smallest Arkansas contributor to light extinction at both Arkansas Class I areas.

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Figure 8 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Caney Creek Wilderness Area in 2018

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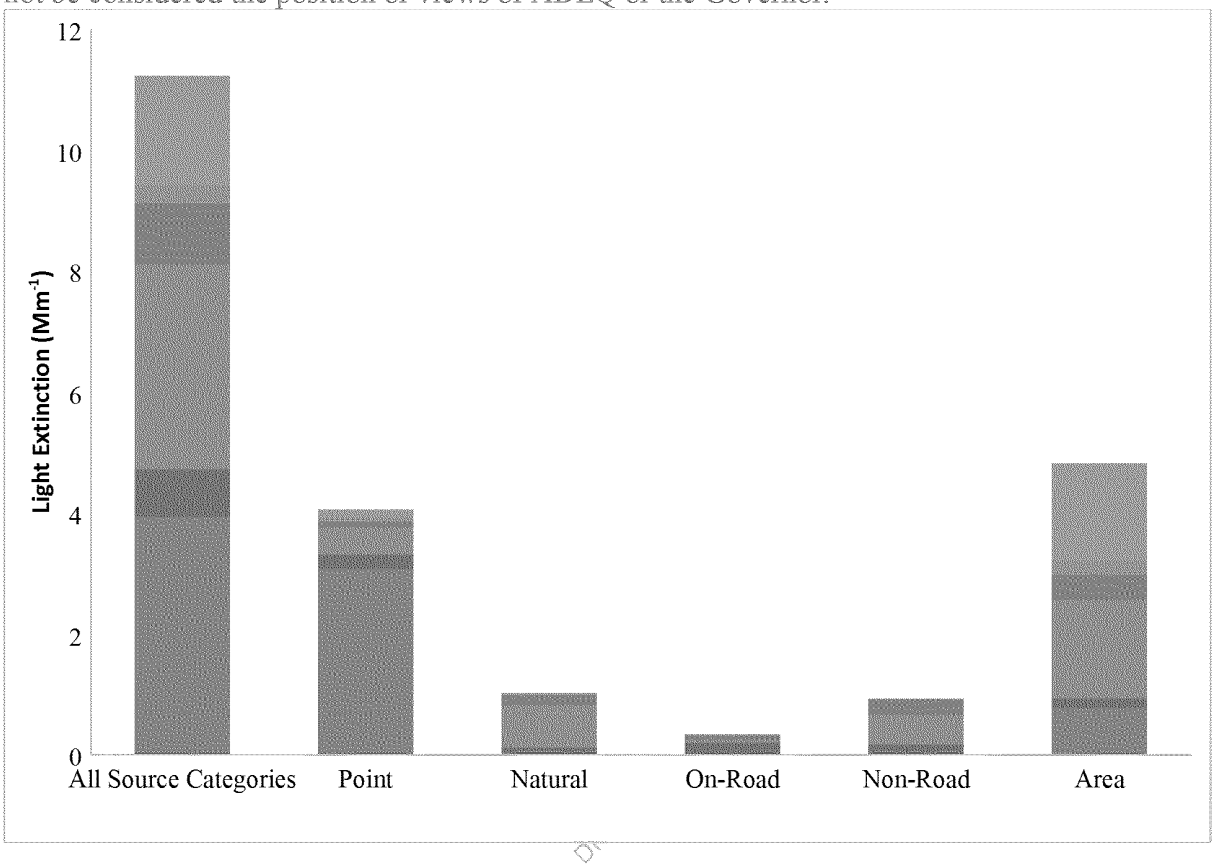

Figure 9 Modeled Light Extinction due to Arkansas Sources for the 20% Worst Days at Upper Buffalo Wilderness Area in 2018

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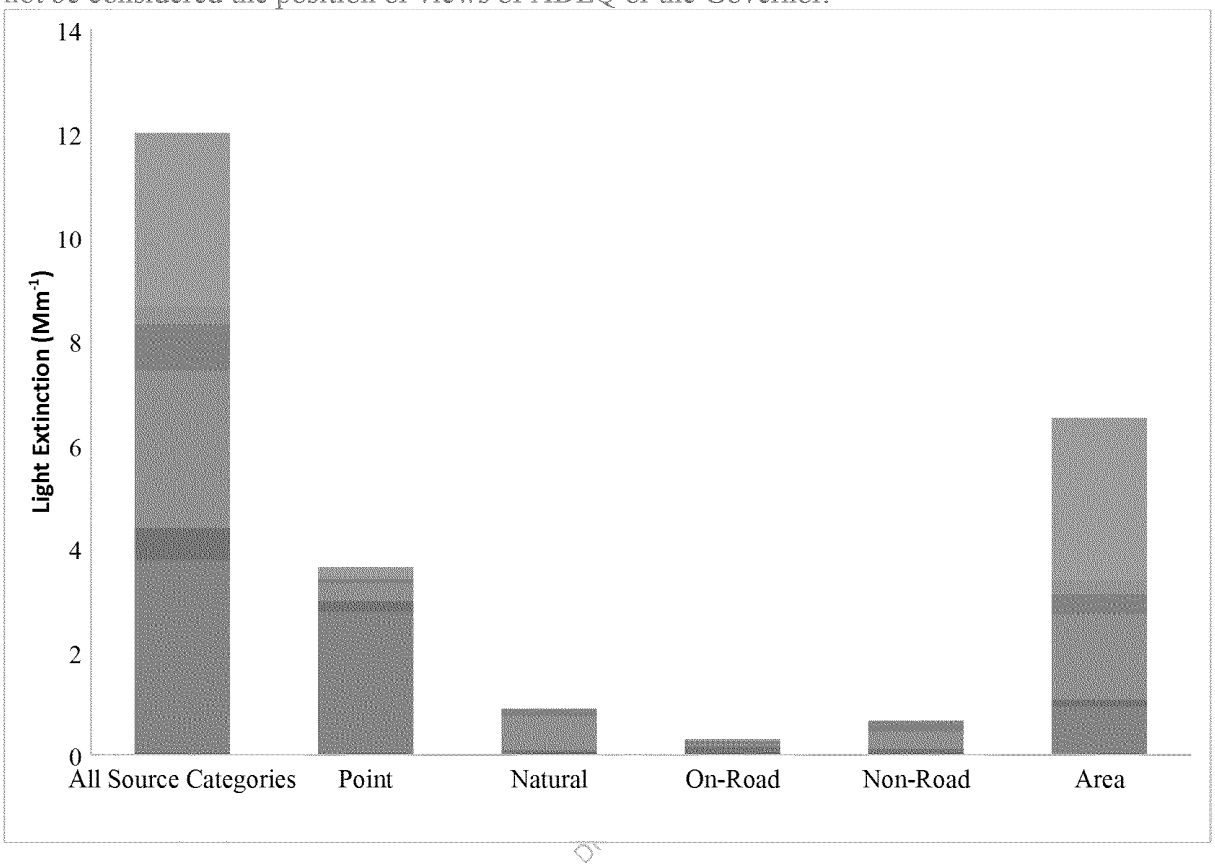

3. Summary of Key Pollutant and Source Category Findings

The region-wide PSAT data indicate that the relative contribution of SO_4 to light extinction at Arkansas Class I areas is much higher than for other pollutants on the twenty percent worst days. The majority of light extinction due to SO_4 can be attributed to point sources. The PSAT results for Arkansas sources illustrate that the relative contribution to light extinction of the various species from Arkansas sources is not as weighted toward SO_4 as the regional data set showed. Approximately a quarter of light extinction at Arkansas Class I areas resulting from sources located in Arkansas can be attributed to point sources of SO_4. Light extinction from all species associated with the point source category is smaller than for area sources when only sources located in Arkansas are considered. POA and CM are the primary species associated with area source contributions to light extinction.

After examining both region-wide PSAT data and data for Arkansas sources, ADEQ has identified SO_4 as the key species contributing to light extinction at Caney Creek and Upper Buffalo Wilderness Areas. Area sources do contribute a larger proportion of total light extinction when only sources located in Arkansas are considered; however, the cost-effectiveness for control of POA and CM species from many individual small sources is difficult to quantify. Only a small proportion of total light extinction is due to NO_3 from Arkansas sources and this

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proportion has historically been driven by onroad sources. NO_3 from Arkansas point sources contributed less than half a percent of total light extinction on the twenty percent worst days at Caney Creek and Upper Buffalo based on 2002 PSAT data and is projected to contribute even less in 2018. Attribution of light extinction to soil and EC for Caney Creek and Upper Buffalo remain in both regional and Arkansas data sets.

The primary driver of SO_4 formation is emissions of SO_2 from point sources both region-wide and in Arkansas. As such, in this SIP ADEQ evaluates sources emitting at least 250 tons per year (tpy) of SO_2. These sources will be evaluated to determine whether their emissions and proximity to Arkansas Class I areas warrant further analysis using the four statutory factors.

C. Identification of Potential Reasonable Progress Sources for the First Planning Period

As a starting point to identifying which sources to evaluate for controls in ADEQ's reasonable progress analysis, ADEQ compiled a list of all sources that emitted at least 250 tpy of sulfur dioxide as reported to the EPA Emission Inventory System (EIS) in any given year between 2002 and 2015.[30] For those sources that participate in the Acid Rain Program, ADEQ obtained 2015 sulfur dioxide emissions from the Air Markets Program Data tool.[31] ADEQ then narrowed the list of sources to eleven sources that emitted at least 250 tons per year averaged over most recent three-year period for which data is available. These sources are listed in Table 9 below.

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Table 9 Sulfur Dioxide Emissions from Sources Emitting Greater Than 250 Tons per Year

Facility	Most Recent Three-Year Period	Average Sulfur Dioxide Emissions (Tons Per Year)
Entergy White Bluff*	2014–2016	24,346
Entergy Independence	2014–2016	22,531
Flint Creek Power Plant (SWEPCO)*	2014–2016	5,350
Plum Point Energy Station Unit 1	2014–2016	2,759
FutureFuel Chemical Company	2013–2015	2,837
Domtar A.W. LLC, Ashdown Mill*	2013–2015	1,553
Evergreen Packaging-Pine Bluff	2013–2015	986
Albemarle Corporation-South Plant	2013–2015	1,382
SWEPCO- John W. Turk Jr. Power Plant	2014–2016	908
Ash Grove Cement Company/Foreman Cement Plant	2013–2015	369
Nucor-Yamato Steel Company	2013–2015	301

[30] Emissions Inventory data was obtained from the Emission Inventory System (EIS) Gateway from the following datasets 2002 National Emissions Inventory, 2005 National Emissions Inventory, 2008 National Emissions Inventory V3, 2009 Arkansas Department of Environmental Quality, 2010 Arkansas Department of Environmental Quality, 2011 National Emissions Inventory V2, 2012 Arkansas Department of Environmental Quality, 2013 Arkansas Department of Environmental Quality, 2014 National Emissions Inventory V1, and 2015 Arkansas Department of Environmental Quality.

[31] https://ampd.epa.gov/ampd/

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*Facilities are subject to BART requirements which satisfy the four factor analysis requirement for reasonable progress for these sources.

Entergy White Bluff, Flint Creek, and Domtar are all subject to BART limitations as part of this SIP. Since the BART analyses conducted to establish these control requirements are based on an assessment of many of the same factors that must be addressed in establishing the reasonable progress goals, these control requirements satisfy the reasonable progress goal-related requirements for review of these sources during this planning period. No additional emissions controls are necessary for these sources. For the other sources listed in Table 9, ADEQ calculated the total average actual emissions rate (Q) in tons of SO_2 per year over the most recent three-year period and determined the distance (D) in kilometers of each source to its closest Class I area. A Q divided by D value of ten was used as a threshold for further evaluation of reasonable progress controls. This value was selected based on guidance contained in the BART guidelines and is consistent with the approach used in other EPA rulemakings.[32] Table 10 lists the Q/D values for these sources.

Table 10 Q/D Values for Large SO_2 Point Sources[33]

Facility	Upper Buffalo	Caney Creek
Entergy Independence	**126**	**81**
Plum Point Energy Station Unit 1	9	7
FutureFuel Chemical Company	**17**	**10**
Evergreen Packaging-Pine Bluff	4	5
Albemarle Corporation-South Plant	5	9
SWEPCO- John W. Turk Jr. Power Plant	4	**11**
Ash Grove Cement Company/Foreman Cement Plant	1	5
Nucor-Yamato Steel Company	1	1

Three sources identified in Table 10 had a maximum Q/D value greater than or equal to ten: Entergy Independence, FutureFuel Chemical Company, and John W. Turk Jr. Power Plant. Entergy Independence is the second largest point source of SO_2 in Arkansas with average 2014–2016 emissions of 22,531 tpy. By contrast, FutureFuel Chemical Company averaged 2,837 tpy (2013–2015) and John W. Turk Jr. Power Plant averaged 908 tpy (2014–2016). SO_2 emissions from FutureFuel Chemical Company and John W. Turk Jr. Power Plant are approximately an order of magnitude lower than emissions from Entergy Independence. FutureFuel Chemical Company was a BART-eligible source and modeling performed in the

[32] 40 CFR part 51, app. Y, § III; Promulgation of Air Quality Implementation Plans; Arizona; Regional Haze and Interstate Visibility Transport Federal Implementation Plan; Proposed Rule (February 18, 2014)
[33] Class I Areas_Q Over D Calculations.xls

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development of the 2008 AR RH SIP demonstrated that FutureFuel Chemical Company had less than a 0.5 dv impact on Class I areas. John W. Turk Jr. Power Plant began operation in 2012 and has implemented best available control technology, which is more stringent than BART. As such, ADEQ determined that it was appropriate to defer consideration of these sources under reasonable progress to future regional haze planning periods. Deferring consideration of these two facilities is consistent with EPA's determination in the final AR RH FIP. ADEQ will focus its evaluation of the four reasonable progress factors on Entergy Independence because it is the second highest emitter of SO_2 in Arkansas, has high Q/D values, and is not subject to BART.

D. Consideration of Reasonable Progress Factors for Entergy Independence

In determining reasonable progress, Clean Air Act section 169(A)(g)(1) requires states to examine the cost of compliance, the time necessary for compliance, energy and nonair impacts, and remaining useful life. This section details our analysis of the factors on potential control strategies for SO_2 at Entergy Independence.

1. Cost of Compliance

The Entergy Independence Power Plant is a coal-fired electric generating station with two identical 900 megawatt boilers. These boilers burn Wyoming Powder River Basin sub-bituminous coal as their primary fuel and No. 2 fuel oil or bio-diesel as start-up fuel. The layout and boiler units used at this facility are similar to those used at Entergy White Bluff; however, units at Independence were installed in 1983, nine years after installation of units at Entergy White Bluff, and are not subject to BART. Because Entergy White Bluff and Entergy Independence are sister facilities, costs for different control technologies examined in the BART analysis for Entergy White Bluff should provide reasonably accurate cost estimates for Entergy Independence. This method of assessing cost of compliance for Entergy Independence is supported by documentation provided in the docket for the AR RH FIP.[34]

In the AR RH FIP, EPA evaluated Wet FGD and Dry FGD for Entergy Independence using similar cost assumptions as were used for their BART analysis for Entergy White Bluff. EPA eliminated Wet FGD during its analysis due to the minimal increase in estimated visibility improvement achieved at a much higher cost than Dry FGD. Therefore, ADEQ determined that it is reasonable to eliminate from consideration Wet FGD.

Entergy comments on the AR RH FIP and a report by engineering firm Sargent and Lundy, LLC ("S & L") demonstrate errors in EPA's cost estimates and emissions reduction calculation methodology that overestimate the cost-effectiveness of installation of Dry FGD at Entergy White Bluff.[35] In the AR RH FIP, EPA similarly overestimates cost-effectiveness of Dry FGD at Entergy Independence in its reasonable progress analysis for SO_2 controls. The analysis

[34] EIA Consolidated Data_WB and Ind_Y2012.xlsx

[35] *Review of EPA's Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan* (2015).

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contained herein evaluates the cost-effectiveness of Dry FGD at Entergy Independence as opposed to continued use of low sulfur coal for the remainder of the 2008–2018 Regional Haze planning period.

By using similar assumptions to those used in the Entergy White Bluff BART analysis for the AR RH FIP, EPA underestimates the cost of Dry FGD and overestimates the amount of SO_2 emissions reductions at Entergy Independence that can be achieved. S & L's report estimates that actual cost-effectiveness for Dry FGD at Entergy White Bluff would be $5,462 – $6,445 more expensive per ton of SO_2 reduced than EPA estimated in the AR RH FIP.[36] Given the similar layout and age of Entergy Independence to Entergy White Bluff, the margin by which EPA overestimated the cost-effectiveness of installation of Dry FGD at Entergy Independence is likely within a similar range.

In EPA's reasonable progress determination for Entergy Independence in the AR RH FIP, EPA underestimates certain costs and makes unreasonable assumptions with respect to the amortization period for Dry FGD. EPA applied the same total annualized cost of installing and operating Dry FGD developed for Entergy White Bluff to the Entergy Independence units.[37] According to S&L's report, EPA made several errors in developing Entergy White Bluff's total annualized cost which resulted in an underestimation of the total cost of Dry FGD at Entergy White Bluff by approximately $200 million.[38] Furthermore, EPA assumes an unreasonable amortization period for the cost of Dry FGD at Entergy Independence. EPA's amortization period is based on the equipment life of the Dry FGD scrubbers, but does not take into account the remaining useful life of Entergy Independence Units 1 and 2. As described further in the remaining useful life factor section of this four-factor analysis, the amortization period used in EPA's FIP extends twenty-eight years beyond the book life of Entergy Independence Units 1 and 2. Although coal-fired electric generating units may operate longer than the typical book life for such units, it is not reasonable to anticipate that they will be operating twenty-eight years longer. Taken together, EPA's cost and amortization period assumptions artificially improve the cost-effectiveness of installation of Dry FGD at Entergy Independence.

In the AR RH FIP, EPA also erred in its determination of baseline emissions and the amount of SO_2 that would be reduced from installation of Dry FGD at Entergy Independence resulting in artificially lower cost-effectiveness values. EPA calculated the baseline by taking the average annual SO_2 emissions for 2009–2013 and excluded the minimum and maximum years.[39] EPA

Prepared by Sargent & Lundy for Entergy Arkansas, Inc., Docket No. EPA-R06-OAR-2015-0189.

[36] *Review of EPA's Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan* (2015). Prepared by Sargent & Lundy for Entergy Arkansas, Inc., Docket No. EPA-R06-OAR-2015-0189.

[37] EPA (2015). *Technical Support Document for the SDA Control Cost Analysis for the Entergy White Bluff and Independence Facilities Arkansas Regional Haze Federal Implementation Plan (SO_2 Cost TSD).* Docket No. EPA-R06-OAR-2015-0189.

[38] *Review of EPA's Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan* (2015). Prepared by Sargent & Lundy for Entergy Arkansas, Inc., Docket No. EPA-R06-OAR-2015-0189.

[39] *Promulgation of Air Quality Implementation Plans; State of Arkansas; Regional Haze and Interstate Visibility*

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also assumed a controlled emissions rate of 0.06 lb/MMBTU based on a vendor guarantee that does not reflect controlled emissions rates achieved on a long-term basis or impacts from variation in operating parameters according to the S & L report.[40] S & L provides a list of permit limitations based on projects using similar technology to the Dry FGD mandated for Entergy Independence in the AR RH FIP. The median SO_2 permit limitation was 0.10 lb/MMBtu.[41] By assuming a lower controlled emissions rate than is achievable, EPA artificially inflated the amount of SO_2 emissions that it estimates would be reduced. Overestimation of the amount of SO_2 that can be reduced makes a control technology appear more cost-effective. Furthermore, Entergy Independence has seen a decrease in dispatch due to market conditions for coal and natural gas that is expected to continue during this planning period. This decrease in dispatch has resulted in a reduction in annual SO_2 emissions. As a result, installation and use of Dry FGD will not result in the level of emissions reductions assumed by EPA in their cost-effectiveness calculations.

The combination of underestimation in cost of installation and operation of Dry FGD and the overestimation of SO_2 emissions reductions likely to be achieved from operation of Dry FGD at Entergy Independence Units 1 and 2 results in unrealistic cost-effectiveness values used to justify that the requirement to meet an emissions rate based on Dry FGD in the AR RH FIP. In comments on the AR RH FIP, Entergy asserts that the cost-effectiveness of Dry FGD, assuming that the costs at Entergy Independence match the cost of installation and operation at Entergy White Bluff, would be $4,234/ton of SO_2 removed at Entergy Independence Unit 1 and $3,909 per ton of SO_2 removed at Entergy Independence Unit 2.[42] Based on Entergy's assessment, EPA artificially lowered the cost-effectiveness by $1,757 at Entergy Independence Unit 1 and by $1,623 at Unit 2. Given the likelihood of a continued decrease in dispatch at Entergy Independence that was not factored into EPA's calculations for the AR RH FIP and Entergy's calculations in their comments on the AR RH FIP, it is likely that Dry FGD will be even less cost-effective at Entergy Independence than EPA's or Entergy's estimates.

Furthermore, ADEQ finds that dry FGD not cost effective when considering the cost-per-deciview of visibility improvement. The cost-per-deciview is orders of magnitude greater than the cost per ton of pollutant removed. S & L estimates that cost-per-deciview is approximately $1.33 billion per deciview improvement at Caney Creek and $1.53 billion per deciview improvement at Upper Buffalo.[43] ADEQ finds that Dry FGD is not cost effective when independently considering either the cost-per-ton of pollutant removed or the cost-per-deciview

Transport Federal Implementation Plan; Final Rule (2016). 81 FR 66332.

[40] *Review of EPA-s Cost Analysis for Arkansas Regional Haze Proposed Federal Implementation Plan* (2015). Prepared by Sargent & Lundy for Entergy Arkansas, Inc.

[41] Id.

[42] Entergy Arkansas Inc. (2015). *Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas*. Docket ID No. EPA-R06-OAR-2015-0189

[43] Entergy Arkansas Inc. (2015).Appendix A to *Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas* at p. 21. Docket ID No. EPA-R06-OAR-2015-0189

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improvement of Dry FGD.

2. Existing controls

Emissions of SO_2 from Entergy Independence units are currently controlled by the use of low sulfur coal. The new source performance standard for sulfur dioxide is 1.2 lb/MMBtu; however, a more stringent prevention of significant deterioration (PSD) emissions limitation of 0.93 lb/MMBtu is in effect for these units. Using low sulfur coal, Entergy Independence has been able to achieve monthly average emissions rates in the range of 0.39–0.63 lb SO_2/MMBtu.[44] The average monthly emissions rate between 2009 and 2015 was 0.54 lb SO_2/MMBtu at each unit. Thus, Entergy Independence has achieved lower emissions rates than required by permit through existing controls.

Entergy Independence Units 1 and 2 are currently permitted to emit 35,438.6 tons per year (tpy) of SO_2 (8,091.0 lb SO_2/hr) each or 70,877.2 tpy of SO_2 (16,182 lb SO_2/hr) combined.[45] Annual emissions for Entergy Independence Units 1 and 2 combined from 2008–2014 ranged from 26,448–32,974 tpy SO_2—less than half of total allowable emissions in their permit.[46] Annual emissions from Entergy Independence dropped to 14,994 tpy SO_2 in 2015.[47] Annual emissions from Entergy Independence increased to 22,569 SO_2 in 2016, but are lower than any annual emissions rate from 2008–2014.[48] Market trends for coal and natural gas have resulted in decreased dispatch of Entergy Independence and consequently reduced emissions of SO_2. According to data from the Energy Information Administration, the economic pressure on coal units due to low natural gas prices is expected to continue throughout the rest of the 2008–2018 planning period and beyond.[49] Figure 10 shows energy consumption trends from the electricity sector by fuel from 1980–2016 and projects trends out to 2040. As a result of current controls and decreased dispatch, installation of Dry FGD at Entergy Independence would remove less SO_2 than assumed in EPA's reasonable progress analysis contained in the AR RH FIP. SO_2 concentration also influences the performance of Dry FGD, with reduced removal efficiency at

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[44] Air Markets Program Data: Monthly Heat Input and SO_2 Data for Entergy Independence for 2009 – 2016 <https://ampd.epa.gov/ampd/>
[45] Entergy Arkansas, Inc. – Independence, Permit No. 0449-AOP-R10 AFIN: 32-00042
[46] 2009 Arkansas Department of Environmental Quality Emissions Inventory, 2010 Arkansas Department of Environmental Quality Emissions Inventory, 2011 National Emissions Inventory Version 2, 2012 Arkansas Department of Environmental Quality Emissions Inventory, 2013 Arkansas Department of Environmental Quality Emissions Inventory, 2014 National Emissions Inventory Version 1 <https://eis.epa.gov/eis-system-web>
[47] Air Markets Program Data: Air Markets Program Data: Annual SO_2 Data for Entergy Independence for 2015 <https://ampd.epa.gov/ampd/>
[48] Air Markets Program Data: Air Markets Program Data: Quarterly SO_2 Data for Entergy Independence for 2015 and 2016 <https://ampd.epa.gov/ampd/>
[49] *Annual Energy Outlook 2017.* U.S. Energy Information Administration

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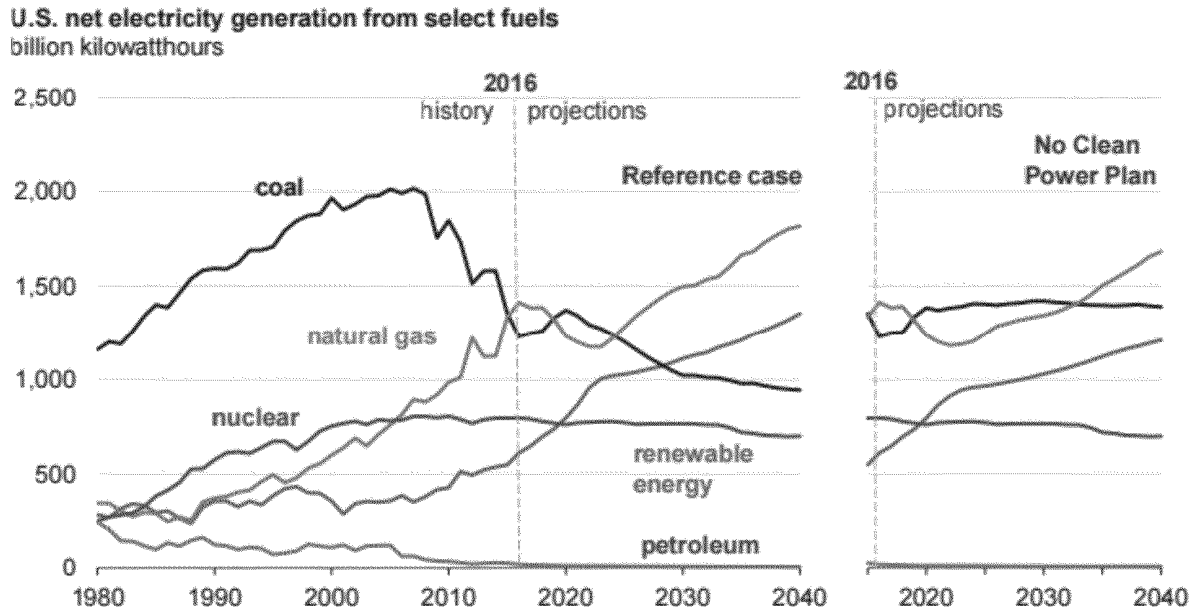
lower concentrations of SO_2.[50]

Figure 10 United States Electricity Sector Energy Consumption by Fuel[51]



3. Time Necessary for Compliance

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In the AR RH FIP, EPA required that Entergy Independence comply with an emissions rate based on the installation and operation of dry FGD on Units 1 and 2 by 2021. This compliance date was based on EPA's assumption that five years would be sufficient time for Entergy Independence to install and operate Dry FGD; however, this five-year compliance window falls outside of the first planning period (2008–2018) for which the FIP was promulgated. There is not sufficient time to install Dry FGD at Entergy Independence before the conclusion of the first planning period that EPA's AR RH FIP and this replacement SIP cover. Therefore, it is reasonable to rely upon only controls that can be implemented during the 2008–2018 planning period for determining RPGs. As such, Arkansas concludes that continued operation of existing controls in place for Entergy Independence are reasonable given the time remaining in this planning period.

4. Energy and Nonair Quality Environmental Impacts of Compliance

Dry FGD utilizes lime slurry to remove SO_2 from flue gas. In the process, particulate matter is

[50] Schnelle, K and Brown, C. (2002). *Air Pollution Control Technology Handbook*. Kreith, F., Ed. at 18.2.3 <http://dlia.ir/Scientific/e_book/Technology/Environmental_Tech_Sanitary_Engine/TD_878_894_Special_Types_of_Environment_/020751.pdf>

[51] U.S. Energy Information Administration. (2017). Annual Energy Outlook 2017 at70. <http://www.eia.gov/outlooks/aeo/pdf/0383(2017).pdf>

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generated that must be controlled through use of a baghouse or electrostatic precipitator. Once collected, the waste material is disposed of through landfilling. Costs associated with control of particulate matter and additional power requirements were factored into the cost estimates calculated by Entergy and EPA. Entergy has not indicated unusual circumstances that would create greater problems than experienced elsewhere that Dry FGD was utilized as BART.

5. Remaining Useful Life

In the AR RH FIP, EPA erred by not taking into consideration the remaining useful life of Entergy Independence Units 1 and 2. Instead, EPA used the estimated life of Dry FGD scrubbers (thirty years) for amortization rather than the remaining useful life of the Entergy Independence units. EPA asserts that the thirty-year equipment life for scrubbers is appropriate because no enforceable shut-down date has been set for Entergy Independence Units 1 and 2. This method of amortization is misleading given that EPA's typical modeling assumptions use a forty-year book life for coal-fired power plants and a fifteen-year schedule for financing environmental retrofits.[52] Entergy Independence Unit 1 was installed in 1983 and Unit 2 was installed in 1984. Units 1 and 2 will reach their fortieth year in 2023 and 2024, respectively; therefore, an assumption of a thirty-year amortization period starting in 2021—as was proposed in the AR RH FIP—does not reasonably take into account the remaining useful life of the units. Coal-fired power plants may continue to operate beyond the forty-year book life assumption; but, it is unlikely that these units would operate twenty-eight additional years beyond their book life.

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6. Degree of Improvement in Visibility

Although the degree of visibility improvement is not one of the four statutory factors for a reasonable progress analysis, the ultimate goal of any reasonable progress controls should be achieving visibility improvements. Imposition of controls that would not result in tangible visibility benefits during the planning period that a SIP (or FIP) addresses is not reasonable. In comments on the proposed AR RH FIP, Entergy points out that only a small fraction of the visibility improvement that EPA estimates would result from the installation and operation of all controls in the proposed FIP could be ascribed to Entergy Independence.[53] Entergy estimates that installation of Dry FGD at Independence would only result in a 0.08 dv improvement at Caney Creek and a 0.07 dv improvement at Upper Buffalo on the twenty percent worst days.[54] A value of one dv is considered perceptible. Furthermore, the cost per deciview based on those estimates would be approximately $1.33 billion per deciview improvement at Caney Creek and $1.53

[52] Chapter 8: Financial Assumptions. (2013). In *Documentation for Base Case v. 5.13*. (pp. 8-14 – 8-15). Retrieved November, 2016, from https://www.epa.gov/airmarkets/documentation-base-case-v513-financial-assumptions at 8-14 – 8-15.

[53] Entergy Arkansas Inc. (2015). *Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas*. Docket ID No. EPA-R06-OAR-2015-0189

[54] Entergy Arkansas Inc. (2015). *Comments on the Proposed Regional Haze and Interstate Visibility Transport Federal Implementation Plan for Arkansas*. Docket ID No. EPA-R06-OAR-2015-0189

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billion per deciview improvement at Upper Buffalo.[55]

E. Additional Controls Necessary for Reasonable Progress at Arkansas Class I Areas

Based on this analysis, ADEQ has determined that no additional controls for SO_2 or PM beyond BART are necessary for reasonable progress during the 2008–2018 planning period. The Arkansas NOx Regional Haze SIP submitted to EPA required compliance with the CSAPR trading program for ozone season NOx for all Arkansas EGUs participating in that program to address control of NOx for reasonable progress. The alternative to BART scenario for Domtar Ashdown Mill provides for greater progress than the unit-specific BART determinations for that facility.

Through an evaluation of emissions and distance from wilderness areas, ADEQ determined that only Entergy Independence need be considered in a four factor analysis; however, ADEQ's analysis demonstrates that installation of Dry FGD, as was finalized in the AR RH FIP, is neither reasonable nor necessary to achieve reasonable progress for the 2008–2018 planning period. Both Entergy's and EPA's cost-effectiveness estimates for Dry FGD at Entergy Independence exceed screening thresholds used for cost-effectiveness in other approved reasonable progress analyses.[56] As such, Arkansas has determined that the cost per ton of SO_2 reduced by installation and operation of Dry FGD is not reasonable for the 2008–2018 planning period. Entergy Independence's actual emissions are much lower than permitted and emissions from Entergy Independence are expected to continue to remain below permitted limitations due to economic dispatch throughout the remainder of the current regional haze planning period. It is not reasonable to require installation of costly controls during the 2008–2018 planning period based on the assumption that Entergy Independence will run at a greater capacity than is economically realistic. Furthermore, the time necessary for installing and operating Dry FGD at Entergy Independence would extend beyond the period covered by the AR RH FIP and this SIP. Most importantly the high cost to achieve visibility improvements that are greater than an order of magnitude lower than perceptible on the twenty percent worst days is not reasonable.

F. Reasonable Progress Goals for Arkansas Class I Areas

ADEQ is revising the RPGs established in the 2008 AR RH SIP for the twenty percent worst days at Caney Creek and Upper Buffalo Wilderness Areas to reflect control measures included in this SIP revision and the revision proposed in July 2017 that are required to be in effect by the end of the first planning period. In order to provide RPGs that account for emissions reductions from SIP controls, we have used a method similar to that used by EPA for the AR RH FIP. This

[55] Id.

[56] *Approval and Promulgation of Air Quality Implementation Plans; Common Wealth of Kentucky; Regional Haze State Implementation Plan: Proposed Rule* (2011). 76 FR 78194

EPA approved RPGs in Kentucky SIP based on CAIR, which had a \$2000/ton SO_2 cost-effectiveness screening threshold.

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method is based on a scaling of light extinction components in proportion to emissions changes anticipated from SIP controls for which compliance is required on or before December 31, 2018. ADEQ is not revising its goal of no degradation on the twenty percent best days included in the 2008 AR RH SIP.

Using the same formulas EPA used to develop its RPGs for the AR RH FIP, ADEQ scaled CENRAP's CAMx 2018 projection of light extinction components for SO_4 and NO_3 in proportion to the SIP revision's emissions reductions for SO_2 and NOx, respectively. ADEQ made updates to reflect the most recent three years of data for emissions and heat input for Arkansas EGUs and Domtar Ashdown Mill. The most recent three years of data (2014–2016) were used as opposed to EPA's method of using the five most recent years of data minus the minimum and maximum values (2009–2013) to ensure that recent changes in dispatch of Arkansas EGUs were captured.[57] The results of our analysis for the twenty percent worst days for 2018 for Caney Creek and Upper Buffalo are included in Table 11.[58]

Table 11 Reasonable Progress Goals for 2018 for Caney Creek and Upper Buffalo

Class I Area	2018 RPG 20% Worst Days (dv)
Caney Creek	22.47
Upper Buffalo	22.51

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Figure 11 and Figure 12 demonstrate that Arkansas is already achieving greater visibility improvements than the RPGs listed in Table 11.

Figure 11 Caney Creek Reasonable Progress Assessment – 20% Worst Days

[57] EIA projections show decreased consumption of coal by electric generating units that is expected to continue through 2040. Therefore, ADEQ anticipates that the coal EGU dispatch trends seen in the most recent three years is likely to continue through the first regional haze planning period and the next two planning periods. See Figure 10

[58] See RPG Calculation Data Sheet provided at https://www.adeq.state.ar.us/air/planning/sip/regional-haze.aspx.

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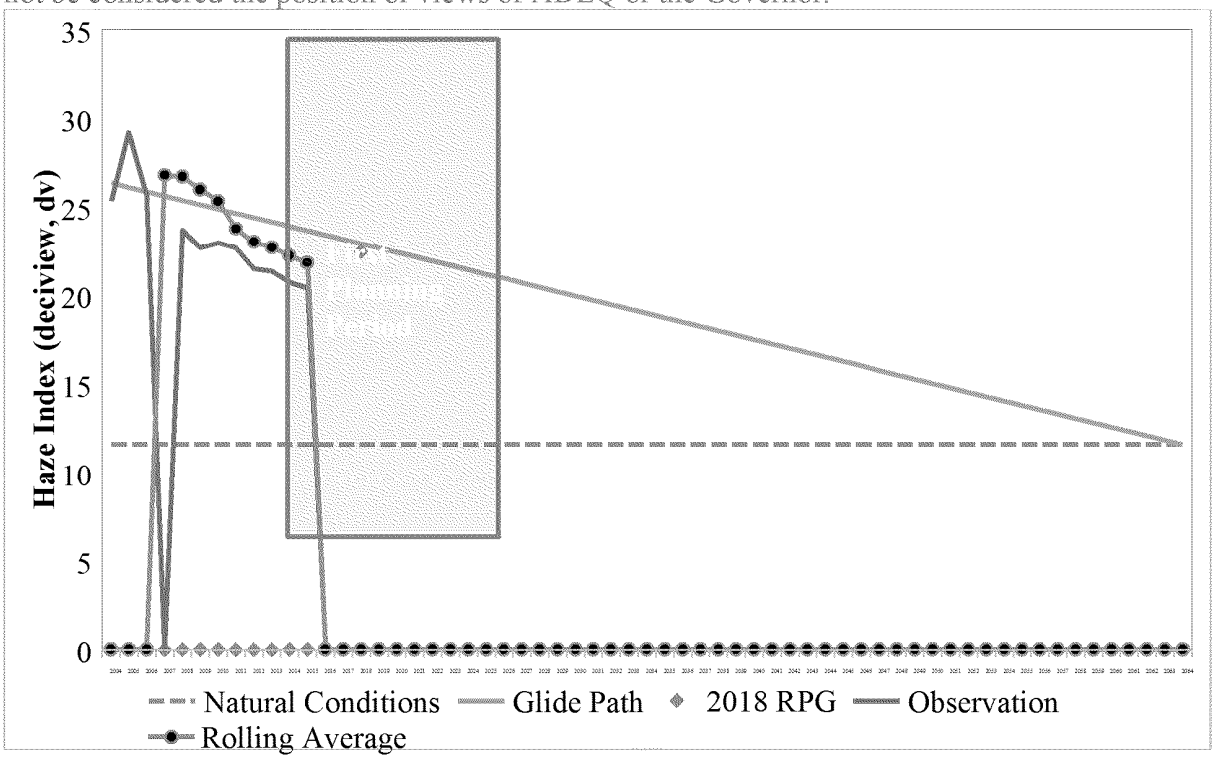

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Figure 12 Upper Buffalo Reasonable Progress Assessment – 20% Worst Days

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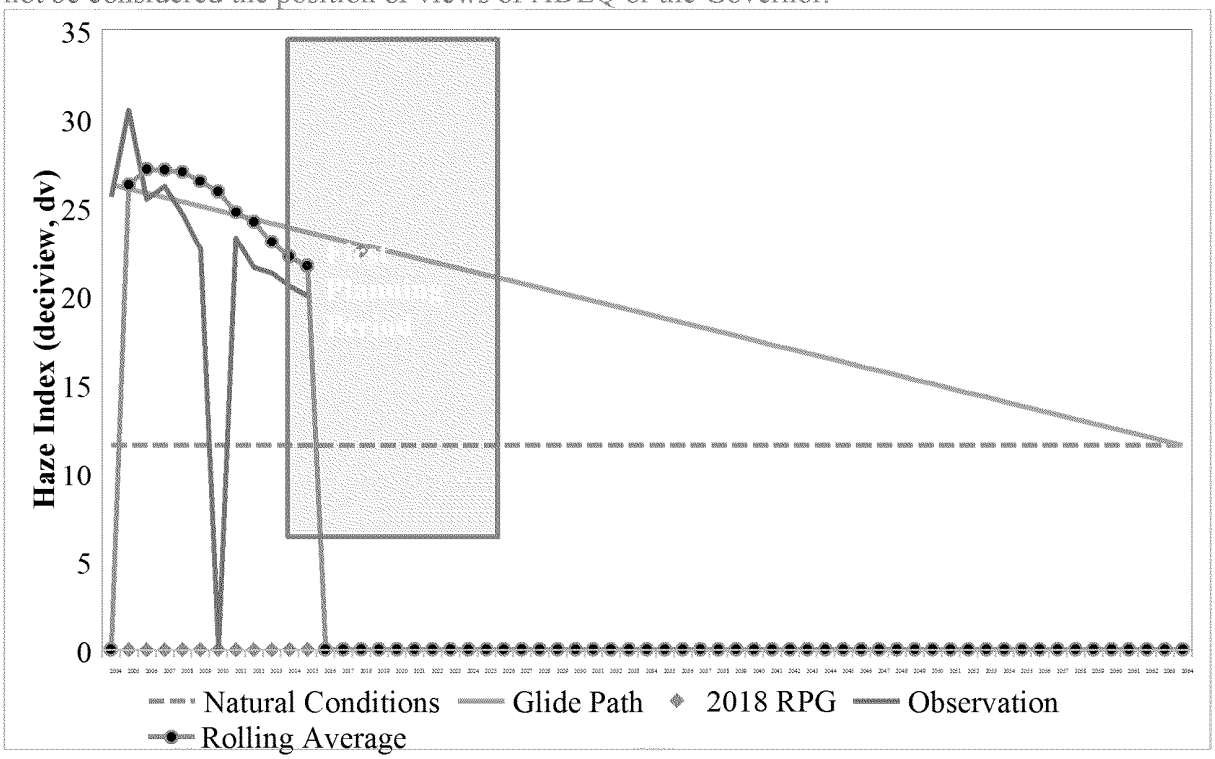

G. Interstate Visibility Transport

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Sources in Arkansas impact two Class I areas in Missouri: Hercules Glade Wilderness Area and Mingo Wilderness Area. CENRAP PSAT data indicates that Arkansas sources contributed approximately seven percent of light extinction at Hercules Glades Wilderness Area and four percent of light extinction at Mingo Wilderness Area. The impact of Arkansas sources are projected to increase between 2002 and 2018 to approximately nine percent of total light extinction at Hercules Glades Wilderness Area and five percent at Mingo Wilderness area based on the CENRAP PSAT data.

Figure 13 and Figure 14 demonstrate that Missouri is on track to achieve its visibility goals. In Missouri's 2009 Regional Haze SIP, Missouri established 2018 reasonable progress goals of 23.71 dv for Mingo Wilderness Area and 23.06 for Hercules Glades Wilderness Area. The most recent calculations for the twenty percent haziest days and twenty percent best days for Class I areas were performed for 2015.[59] For both Mingo Wilderness Area and Hercules Glades Wilderness Area, visibility impairment on the twenty percent haziest days in 2015 beat Missouri's 2018 RPGs for both Class I areas. The most recent five-year rolling average of

59 http://vista.cira.colostate.edu/DataWarehouse/IMPROVE/Data/SummaryData/RHR_2015/SIA_group_means_7_16.csv

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observed visibility impairment on the twenty percent haziest days at Hercules Glades Wilderness Area beat Missouri's 2018 RPG for that Class I area and the most recent five year-rolling average of observed visibility impairment on the twenty percent haziest days at Mingo Wilderness Area is on track to beat Missouri's RPG for that Class I area. The visibility progress observed indicates that sources in Arkansas are not interfering with the achievement of Missouri's RPGs for Hercules Glades and Mingo Wilderness Areas. Therefore, no additional controls on sources within Arkansas are necessary to ensure that other states' visibility goals for their Class I areas are met. The control measures contained in the 2008 AR RH SIP, the NOx Regional Haze SIP revision, and this SIP revision satisfy the interstate transport visibility requirement of CAA 110(a)(2)(D)(i)(II) for the 2008 eight-hour ozone and 2012 annual $PM_{2.5}$ NAAQS.

Figure 13 Hercules Glades Reasonable Progress Assessment – 20% Worst Days

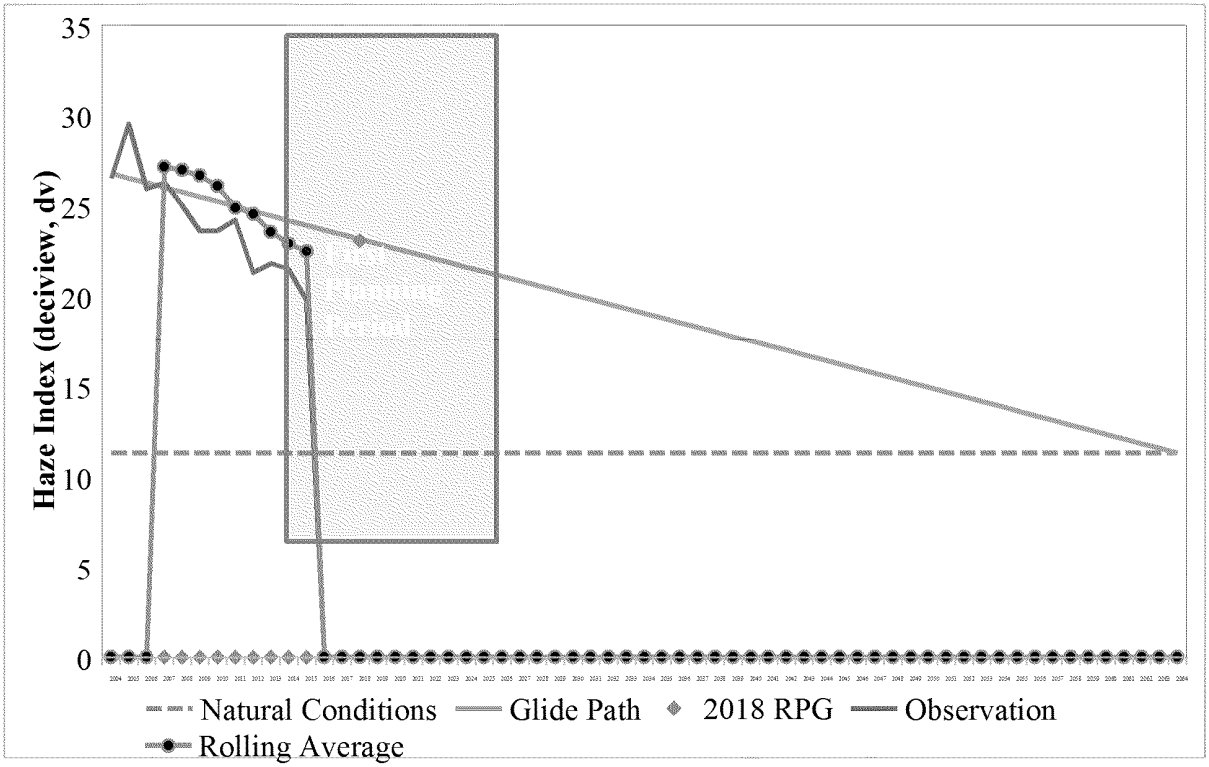

Figure 14 Mingo Reasonable Progress Assessment – 20% Worst Days

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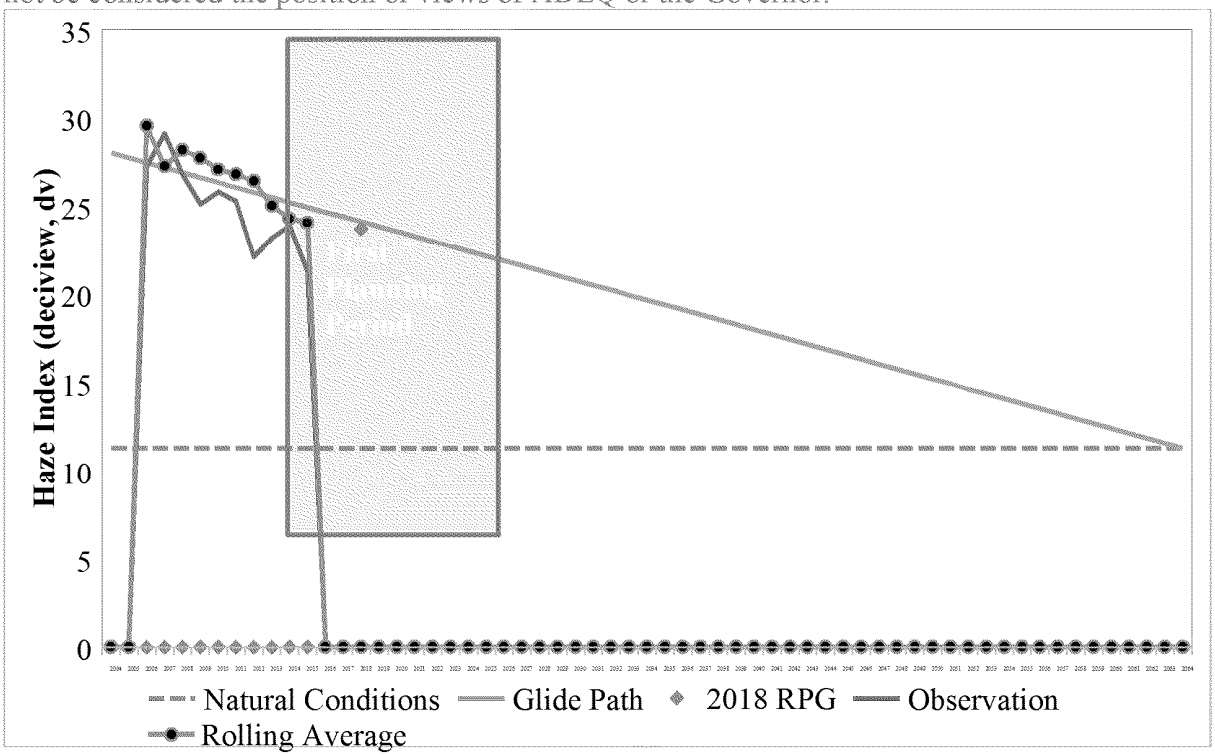

VI. Long-Term Strategy

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In 2012, EPA partially approved and partially disapproved Arkansas's long-term strategy included in the 2008 AR RH SIP. 40 CFR 51.308(d)(3)(v) requires the consideration of the following factors in developing a long-term strategy: (1) Emissions reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment; (2) measures to mitigate the impacts of construction activities; (3) emissions limitations and schedules for compliance to achieve the reasonable progress goal; (4) source retirement and replacement schedules; (5) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the state for these purposes (6) enforceability of emissions limitations and control measures; and (7) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the long-term strategy. Because EPA disapproved some of ADEQ's BART determinations and RPGs, EPA disapproved the emissions limitations and schedules of compliance element of the long-term strategy included in the 2008 AR RH SIP. EPA approved the other six elements of the long-term strategy.

Because the ongoing air pollution programs element of the Arkansas long-term strategy was previously approved, ADEQ is not proposing changes to that element in this SIP revision. Nevertheless, ADEQ notes that the landscape of ongoing air pollution programs has changed since EPA approved that element of the long-term strategy in the 2008 AR RH SIP. These

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changes include more stringent vehicle emission standards, renewable fuel standards, fuel efficiency standards, marine and aircraft standards, mercury and air toxics standards, various national emission standards for hazardous air pollution, and a replacement for the clean air interstate rule in the form of CSAPR. These additional air pollution programs are anticipated to achieve even greater emissions reductions that may result in further visibility improvement than the programs described in the 2008 AR RH SIP. A partial list of ongoing air pollution programs that have been implemented since the 2008 AR RH SIP is provided below:

- Tier 3 Vehicle Emissions and Fuel Standards Program (light duty, medium duty, and some heavy duty) (79 FR 23414, 2014)
- 2017 and Later Model Year CAFÉ Standards (77 FR 62624, 2012)
- Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017 (80 FR 77420, 2015)
- Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy Duty Engines and Vehicles (76 FR 57106)
- Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2 (81 FR 73478, 2016)
- Ocean-going vessels category 3 marine rule (2010), NOx standards for Aircraft (2012)
- Small Nonroad Engine and Marine Spark-Ignition Engines and Vessels Emission Standards Phase 3 (2008)
- New NAAQS standards: 2006 $PM_{2.5}$, 2008 Ozone, 2010 NO_2, 2010 SO_2, 2012 $PM_{2.5}$
- Mercury and Air Toxics Standards
- CSAPR and CSAPR update
- NESHAP for Primary Aluminum Reduction Plants (80 FR 62390, 2015)
- NESHAP for Secondary Aluminum Production (80 FR 56700, 2015)
- NESHAP for Phosphoric acid manufacturing and phosphate fertilizer production (80 FR 50386, 2015)
- NESHAP for Mineral Wool Production and Wool Fiberglass manufacturing (80 FR 45280, 2015)
- NESHAP for Ferroalloys Production (80 FR 37366, 2015)
- NESHAP for Off-site waste and recovery operations (80 FR 14248, 2015)
- NSPS update for New Residential Wood Heaters, New Residential Hydronic Heaters, and Forced-Air Furnaces (80 FR 13672, 2015)
- NSPS update for Kraft Pulp Mills (79 FR 18952, 2014)
- NESHAP for Group IV Polymers and Resins; Pesticide Active Ingredient Production; and Polyether Polyols production (79 FR 17340, 2014)
- NESHAP and NSPS for Portland cement Manufacturing Industry (78 FR 10006, 2013)
- NESHAP for Hard and Decorative Chromium Electroplating and Chroming Anodizing Tanks and NESHAP for Pickling-HCl Process Facilities and Hydrochloric Acid

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Regeneration Plants (77 FR 58220, 2012)

- NSPS and NESHAP for Oil and Natural Gas Sector (77 FR 4940, 2012)
- NSPS for Nitric Acid Plants (77 FR 48433, 2012)
- Greenhouse Gas Tailoring Rule Step 3 and Plantwide Applicability Limits (77 FR 41051, 2012)
- NESHAP for Coal- and Oil-Fired Electric Utility Steam Generating Units and NSPS for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small-Industrial-Commercial-Institutional Steam Generating Units (77 FR 9304, 2012)
- NESHAP for Secondary Lead Smelting (77 FR 556, 2012)
- NESHAP for Wood Furniture Manufacturing Operations revision (76 FR 72050, 2011)
- NESHAP for Primary Lead Processing (76 FR 70834, 2011)
- NESHAP for Marine Tank Vessel Loading Operations and NESHAP for Group I Polymers and Resins (76 FR 22566, 2011)
- NESHAP for Major Sources Industrial, Commercial, and Institutional Boiler and Process Heaters (76 FR 15608, 2011)
- Source Determination for Certain Emissions Units in the Oil and Natural Gas Sector (81 FR 35622, 2016)

In this SIP revision, ADEQ has addressed the disapproved BART determinations and reasonable progress determinations. BART determinations are summarized in Section IV of this SIP and additional technical supporting data are found in Appendices A–E. Emissions limitations and schedules of compliance are rendered enforceable by AOs. Therefore, ADEQ requests that EPA approve the emissions limitations and schedules for compliance and enforceability of emissions limitations and control measures included in this SIP and fully approve Arkansas's revised long-term strategy.

VII. Review, Consultations, and Comments

B. EPA Review with Parallel Processing

The State of Arkansas plans to submit this proposed SIP revision, along with a request for parallel processing and a draft notice of public hearing and opportunity for comment, to EPA. Arkansas also requested that EPA stay the NOx emissions limitations for EGUs contained in the AR RH FIP during EPA's review of this SIP revision and withdraw such limitations upon approval of this SIP revision. The request for parallel processing has been included in Tab A of this proposed SIP package.

C. Federal Land Manager Consultation

In accordance with the provisions of 40 C.F.R. § 51.308(i)(2), ADEQ will consult with the

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designated FLM staff personnel. This consultation will give FLMs the opportunity to discuss their assessment of the impact of the proposed SIP revisions on Arkansas Class I areas——Upper Buffalo Wilderness Area and Caney Creek Wilderness Area—and other Class I areas.

On [Date], ADEQ submitted letters to notify the federal land manager staff of this proposed SIP revision and to provide them with electronic access to the revision and related documents. Any comments received from the FLMs will be considered and posted to ADEQ's Regional Haze webpage: https://www.adeq.state.ar.us/air/planning/sip/regional-haze.aspx. The FLM contact list and notification letters are included in Tab E of this proposed SIP package. Comments from FLMs and responses will be included in the final SIP package

D. Consultation with States

For the 2008 AR RH SIP, ADEQ engaged in extensive interstate consultation with states participating in the CENRAP RPO. Because Missouri has two Class I areas impacted by Arkansas sources, ADEQ submitted a letter on [Date] to Missouri Department of Natural Resources (DNR) air pollution control program staff to notify them of this proposed SIP revision and to provide them with electronic access to the revision and related documents. Any comments received from Missouri DNR will be considered and posted to ADEQ's Regional Haze webpage. The notification letter is included in Tab E of this proposed SIP package. Comments from Missouri DNR and responses will be included in the final SIP package.

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E. Public Review

ADEQ will provide notice of a public hearing to receive public comments on this proposed SIP revision. The notice of the proposal and public hearing will be published in the Arkansas Democrat Gazette, which is a newspaper in circulation statewide, at least thirty days prior to the public hearing and will be posted on ADEQ's website concurrently with newspaper publication of the public notice. The notice will provide logistical information regarding the public hearing and the length of the public comment period. The public comment period for this SIP revision will be at least thirty days in accordance with notice requirements under 40 C.F.R. §51.102.

The notice contains information on the availability of the proposed SIP revision for public inspection at ADEQ information depositories, ADEQ headquarters, and ADEQ's Regional Haze webpage.

Both oral and written comments received by ADEQ during the public comment period will be posted on the ADEQ Regional Haze web page. Copies of written comments, a summary of ADEQ's response to comments, and records from the public hearing will be included in the final SIP package.

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VIII. Conclusion

With the NOx Regional Haze SIP submission and this SIP submission together, ADEQ has addressed all disapproved elements of the 2008 AR RH SIP. Arkansas requests that EPA withdraw the AR RH FIP and review and approve this SIP revision, the NOx Regional Haze SIP revision, and Arkansas's "State Implementation Plan Review for the Five-Year Regional Haze Progress Report" submitted in 2015 as expeditiously as possible.

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APPENDIX A

BART Five-Factor Analysis for Arkansas Electric Cooperative Corporation Bailey and McClellan Generating Stations

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PLACEHOLDER

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APPENDIX B

BART Five-Factor Analyses for Domtar Ashdown Mill

DRAFT

This draft is a working document. All information contained herein is subject to change and may differ substantially from the final document. The information contained in this document should not be considered the position or views of ADEQ or the Governor.

PLACEHOLDER

DRAFT

This draft is a working document. All information contained herein is subject to change and may differ substantially from the final document. The information contained in this document should not be considered the position or views of ADEQ or the Governor.

APPENDIX C

BART Five-Factor Analysis for Entergy Arkansas, Inc. Lake Catherine Plant

DRAFT

This draft is a working document. All information contained herein is subject to change and may differ substantially from the final document. The information contained in this document should not be considered the position or views of ADEQ or the Governor.

PLACEHOLDER

DRAFT

This draft is a working document. All information contained herein is subject to change and may differ substantially from the final document. The information contained in this document should not be considered the position or views of ADEQ or the Governor.

APPENDIX D

BART Five-Factor Analyses for Entergy Arkansas, Inc. White Bluff

DRAFT

This draft is a working document. All information contained herein is subject to change and may differ substantially from the final document. The information contained in this document should not be considered the position or views of ADEQ or the Governor.

PLACEHOLDER

DRAFT

This draft is a working document. All information contained herein is subject to change and may differ substantially from the final document. The information contained in this document should not be considered the position or views of ADEQ or the Governor.

APPENDIX E

BART Five-Factor Analysis for Southwest Power Company Flint Creek

DRAFT

This draft is a working document. All information contained herein is subject to change and may differ substantially from the final document. The information contained in this document should not be considered the position or views of ADEQ or the Governor.

PLACEHOLDER

DRAFT

This draft is a working document. All information contained herein is subject to change and may differ substantially from the final document. The information contained in this document should not be considered the position or views of ADEQ or the Governor.

DRAFT

To: Gunasekara, Mandy[Gunasekara.Mandy@epa.gov]
Cc: keogh@adeq.state.ar.us[keogh@adeq.state.ar.us]; Chapman, Julie[Linck@adeq.state.ar.us]; Montgomery, William[Montgomery@adeq.state.ar.us]
From: Spencer, Stuart
Sent: Fri 8/11/2017 7:25:58 PM
Subject: Arkansas Regional Haze issues
NOx SIP Request for Parallel Processing.pdf
2016-11-22 ADEQ Petition for Reconsideration and Adminstrative Stay EPA-....pdf
Regional Haze Comments to the 2016 Amendments ADEQ.pdf

Mandy,

Thank you for taking the time to talk with me yesterday regarding Arkansas's haze issues. As we discussed, there are a number of moving parts on different tracks- administrative proceedings, litigation, FIP revisions, SIP revisions, etc. This is the time for real and meaningful action, and we believe there are a number of opportunities for EPA to act on outstanding requests that will support Arkansas in our current efforts and help facilitate returning the regional haze program to the state. I have a list of four "asks" I am making on behalf of ADEQ. These "asks", if granted, will help foster the return of true cooperative federalism between EPA and the states; a relationship within which states truly are partners and not pawns. Before I expound upon our "asks", please allow me to provide a bit of background on the primary haze issues we are facing in Arkansas.

Background:

EPA's Arkansas Regional Haze FIP contains significant flaws and does not accurately reflect the significant progress Arkansas has made to fulfill the requirements of the Clean Air Act pertaining to regional haze and visibility over the past several years. The FIP requires state facilities to make significant investments installing pollution control equipment that in one instance ignores the remaining life of that unit and in another instance mandates controls despite better-than-required progress in visibility improvement.

Notably, EPA's FIP mandates billion dollar controls on both Entergy's White Bluff and Independence plants. The FIP controls at the Entergy White Bluff plant are being ordered despite information provided both before and during the comment period on the proposed FIP regarding the plant's remaining useful life. In light of current dispatch and market trends favoring natural gas plants, Entergy provided analyses to both EPA and ADEQ demonstrating that installation of the FIP-mandated billion dollar scrubbers would not be cost effective when balanced against the projected lifespan of the plant. EPA's scrubber mandate was purportedly intended to reduce

haze. However, imposition of the installation of such controls will most likely result in a significantly curtailed life of the plant, causing it to close prematurely and become a stranded asset. The FIP ignores the facts on the ground regarding the Entergy White Bluff plant and imposes controls that are neither required for visibility improvement purposes nor fiscally prudent.

EPA is mandating controls at Entergy's Independence plant simply because it is a similar facility to White Bluff, even though it is not required by regulation. EPA is requiring control on the Independence plant even though Arkansas Class I areas and those outside of Arkansas most significantly impacted by Arkansas sources are projected to meet and exceed the rate of progress expectations for the first planning period ending in 2018. The Entergy Independence Plant is not a BART source and as such, is not required to be controlled during this first planning period unless such control is required to achieve reasonable progress. This facility is the poster child of EPA imposing controls simply because they said they could, not because of any statutory or regulatory requirement to do so.

The FIP mandates are both unnecessary and overly burdensome, imposing billions of dollars in total economic costs without the requisite evaluation of remaining useful life and visibility improvement. The installation of the FIP controls will have no appreciable effect on regional haze and improved visibility and will cause irreparable harm to the facilities regulated by the rule and the Arkansas ratepayers, who will ultimately pay for the controls required under the FIP.

Perhaps most importantly, the monitoring data in our Class I areas supports our position that there is no legal basis for mandating additional controls because reasonable progress, as measured by the reasonable progress goals for this planning period, has already been achieved. The imposition of emissions controls in excess of EPA's statutory authority are unnecessary and will burden the state's ratepayers with costs passed on from impacted utilities for the installation of controls that are wholly without a basis in law or fact.

ADEQ's "asks":

1. **Grant ADEQ's Request for Parallel Processing of the NOx/CSAPR SIP**: ADEQ recently proposed revisions to certain disapproved portions of the Arkansas Regional Haze SIP. The NOx/CSAPR SIP revision replaces source-specific NOx BART determinations included in the 2008 Arkansas Regional Haze SIP, as well as the associated limits promulgated under the

2016 FIP, with reliance on the Cross-State Air Pollution Rule (CSAPR) emissions trading program as an alternative to BART for Arkansas BART-eligible fossil fuel-fired electric generating units, as allowed under the Regional Haze regulations.

When ADEQ published the notice of the NOx/CSAPR SIP, we simultaneously sent a letter to EPA Region 6 requesting that the SIP be parallel processed. This mechanism allows for EPA to propose approval of our SIP concurrent with ADEQ proposing its SIP and publishing it for public comment. The comment period on the NOx/CSAPR SIP closes on August 14th.

We are requesting that EPA grant our request for parallel processing immediately or as soon as possible. Until such time as some sort of relief is granted on the NOx requirements under the FIP, three of our largest coal-fired facilities are faced with staggering outages over five units over an 18-month period to install low NOx burners. This tight timeframe was not in the proposed FIP; it was derived from a comment with no real analysis. Our facilities need relief to avoid inflated costs due to accelerated contract timeframes and concurrent outages. I have attached the Governor's letter for your review and ask that EPA please grant his request.

2. **Grant ADEQ's Petition for Reconsideration of the FIP in full:** ADEQ lodged its request for reconsideration on November 22, 2016. EPA partially granted that reconsideration in April 2016. While granting the partial reconsideration was a positive step, EPA did not address one of the most critical issues - the improper imposition of controls on the Entergy Independence plant.

EPA should correct its omission and grant ADEQ's Petition in regards to the Entergy Independence Plant. The Entergy Independence Plant is not a BART source. Nevertheless, EPA unilateraly pulled the plant into its FIP and improperly performed its own reasonable progress analysis because it "said it could". EPA indicated this analysis was performed by applying the reasonable progress factors set forth in the Regional Haze Rule to require specific emissions controls for both units at the Entergy Independence plant. We disagree. The Entergy Independence Plant was singled out through a cursory evaluation of the National Emissions Inventory data, not a reasoned visibility impact evaluation using EPA's own established framework that takes into account, among other factors, the costs of compliance and progress made to date.

I have attached a copy of ADEQ's Petition for your review. We ask that EPA grant the Petition in its entirety immediately or as soon as possible.

3. **Approve ADEQ's Five-Year Regional Haze Progress Report**:

ADEQ submitted its Five-Year Regional Haze Progress Report to submit to EPA in May 2015. The report was submitted in order to fulfill requirements under the Clean Air Act and the Regional Haze Rule. Specifically, the Report, submitted as a SIP revision, was addressed the federal requirement of submitting periodic reports which evaluate each state's progress towards meeting the Reasonable Progress Goals established for mandatory Class I areas where visibility may be impacted by Arkansas sources.

Our report demonstrated the actions Arkansas has taken to fulfill the federal requirement for periodic progress reports. The data included in the report indicated that visibility impairment is decreasing more rapidly than the glide path and the Reasonable Progress Goals. In accordance with federal requirements, the report include a "negative declaration" stating that further revision of the existing implementation plan is not needed at this time.

I am including a link to ADEQ's Report for your review: https://www.adeq.state.ar.us/air/planning/pdfs/ar_5yr_prog_rep_review-final-6-2-2015.pdf. We ask that EPA approve the report immediately or as soon as possible.

4. **Reconsider the 2016 Revisions to Regional Haze Rule:** On August 4, 2016, ADEQ filed comments on the proposed revisions to the Regional Haze Rule. Despite the concerns we and a number of states and stakeholders raised, the revisions were mostly adopted in the final rule revision.

The overriding point of our comments was that the most substantive modifications to the rule epitomized arbitrary and capricious action on the part of EPA. The revised rule impermissibly divests the states of their intended primary role of determining measures to reduce haze in Class I areas. The major changes to the Regional Haze rule were wholly unexplained and were characterized as "clarifications" despite diverging drastically from EPA's own interpretation during the first planning period.

I have attached a copy of ADEQ's comments on the proposed rule revisions for your review. We ask that EPA grant the multiple petitions for reconsideration that have been lodged regarding

this rule immediately or as soon as possible.

Again, thank you for your continued engagement with my office on these issues. There is a great opportunity here for meaningful and decisive action. I look forward to hearing from you soon on these issues, and so we may confirm a date of time for our in-person meeting.

Sincerely,

Stuart Spencer

Associate Director- Office of Air Quality

Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR 72118

Ph. # (501) 682-0750

Fax # (501) 682-0880

E-mail: SPENCER@adeq.state.ar.us

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To: Schwab, Justin[schwab.justin@epa.gov]
Cc: Minoli, Kevin[Minoli.Kevin@epa.gov]
From: Mills, Derek
Sent: Tue 8/8/2017 9:20:44 PM
Subject: RE: Updating "eggs hatching" chart
Draft Chart of ARLO Deadlines (8-8-17).docx

Justin,

Attached is the chart that we talked about. This incorporates all ARLO listings on the DOJ paper that you sent to me also. Some of those listings from the DOJ paper are at the bottom here because they are listed as "No Date" deadlines. Thanks!

Derek Mills

Special Assistant, Office of General Counsel

U.S. Environmental Protection Agency

(202) 564-3341

-----Original Message-----
From: Schwab, Justin
Sent: Tuesday, August 08, 2017 11:08 AM
To: Mills, Derek <Mills.Derek@epa.gov>
Subject: Updating "eggs hatching" chart

Dear Derek,

Ryan Jackson has asked for essentially the same information as was presented on the chart circulated a few weeks ago, listing rule challenges that have been held in abeyance.

He only wants to know about the air matters.

He has asked for this by COB today. If it cannot be fully updated by then, then we should give him what we can and let him know that it is a work in progress and that we will be updating it soon.

This chart should be broadened in three ways:

1) it should be updated to include all new dates from onedocket, received from ARLO, etc

2) it should include all challenges to air rules or other actions, not only those where the case has been held in abeyance.

3) it should include the list of challenges to the last administration's rules which were never put in abeyance, have been briefed up, and are about to be (or have recently been) set for oral argument. On (3), DOJ put together a list a while back which I think I forwarded to you.

Please let me know when you can discuss.

Best,

Justin

Sent from my iPhone

To: Albores, Richard[Albores.Richard@epa.gov]; Baptist, Erik[baptist.erik@epa.gov]; Fotouhi, David[Fotouhi.David@epa.gov]; Schwab, Justin[Schwab.Justin@epa.gov]; Mills, Derek[Mills.Derek@epa.gov]
From: Trudeau, Shaun
Sent: Thur 9/21/2017 7:59:16 PM
Subject: Wednesday Weekly Report
Wednesday Weekly Report 09212017.docx

Hi all,

Attached please find the updated Wednesday Weekly Report.

Please let me know if you have any questions or concerns.

Thanks!

Shaun

Shaun R. Trudeau

Attorney-Advisor

Special Assistant to the Principal Deputy
Office of General Counsel
U.S. Environmental Protection Agency
Office: 202.564.5127

To: Gunasekara, Mandy[Gunasekara.Mandy@epa.gov]
Cc: Dravis, Samantha[dravis.samantha@epa.gov]; Bolen, Brittany[bolen.brittany@epa.gov]
From: Schwab, Justin
Sent: Tue 9/5/2017 1:29:41 PM
Subject: arkansas regional haze draft briefing paper
Arkanas Regional Haze Briefing Memo 09052017.docx

Do we want to add this to the TX regional haze briefing? Please find attached.

To: Dravis, Samantha[dravis.samantha@epa.gov]; Bolen, Brittany[bolen.brittany@epa.gov]
From: Schwab, Justin
Sent: Thur 8/10/2017 6:09:59 PM
Subject: Fwd: Chart of upcoming court deadlines relating to air rules
Draft Chart of ARLO Deadlines (8-8-17).docx
ATT00001.htm

FYI

Sent from my iPhone

Begin forwarded message:

From: "Schwab, Justin" <schwab.justin@epa.gov>
Date: August 8, 2017 at 7:01:39 PM EDT
To: "Jackson, Ryan" <jackson.ryan@epa.gov>
Cc: "Gunasekara, Mandy" <Gunasekara.Mandy@epa.gov>, "Baptist, Erik" <baptist.erik@epa.gov>, "Fotouhi, David" <fotouhi.david@epa.gov>
Subject: Chart of upcoming court deadlines relating to air rules

Ryan,

As you requested, please find attached a chart of upcoming briefing deadlines (which actually begins in late July so some of these status reports, etc., have already been filed), indicating the air rule that underlies each case.

The table goes in chronological order from late July through early October.

I have highlighted the rules/actions that seem to be of greater policy significance. I have erred on the side of inclusion here, highlighting rules that may not be of policy significance, thinking it was better in the first instance to show you everything we have.

Please let me know how I/OGC can refine this to better suit your needs.

Note that on the last two pages there are a few cases with no date, which have been briefed up but where oral argument has not yet been scheduled. Oral argument could be scheduled at any time.

Best,

Justin

To: Schwab, Justin[Schwab.Justin@epa.gov]
Cc: Zenick, Elliott[Zenick.Elliott@epa.gov]; Srinivasan, Gautam[Srinivasan.Gautam@epa.gov]
From: Greenglass, Nora
Sent: Fri 9/8/2017 2:50:52 PM
Subject: Utah RH 28(j) letter
Conserv Orgs 28j Ltr 09_07_2017.pdf
DENVER-#586989-v1-Utah_28j_response_to_NCPA_letter+OGC_CLEAN.docx

Hi Justin,

Attached are the incoming 28(j) letter in the Utah regional haze litigation and DOJ's draft response. DOJ would like to file this today, if possible.

Please let me know if you have any comments or questions.

Thank you,

Nora

Nora Greenglass

Office of General Counsel

U.S. Environmental Protection Agency

202-564-3095 (office)

Ex. 6 - Personal Privacy (cell)

EARTHJUSTICE

September 7, 2017

FILED VIA ECF

Elisabeth A. Shumaker
Clerk of the Court
United States Court of Appeals for the Tenth Circuit
Byron White United States Courthouse
1823 Stout Street
Denver, CO 80257

Re: *State of Utah, et al. v. EPA*, Nos. 16-9541, 16-9542, 16-9543, 16-9545

To the Clerk of the Court:

Pursuant to Federal Rule of Appellate Procedure 28(j), Respondent-Intervenors HEAL Utah, et al. cite *National Parks Conservation Association v. EPA*, slip op., No. 11-1548 (D.D.C. Aug. 31, 2017) ("*NPCA*"), as supplemental authority for their opposition to EPA's requested abeyance in the above-numbered petitions for review.

NPCA supports Respondent-Intervenors' argument that the combined effect of EPA's request for an abeyance, reconsideration of the Utah Haze Plan, and consent to a stay is an improper attempt to evade the Clean Air Act's mandatory timetable for remedying haze pollution. *See* Respondent-Intervenors' Opp. to EPA's Mot. to Hold Cases in Abeyance, at 13-14 (Doc. 01019851168).

In *NPCA*, the U.S. District Court for the District of Columbia denied EPA's request to extend a consent-decree deadline for promulgating a federal implementation plan to satisfy the Clean Air Act's best available retrofit technology ("BART") requirements for coal-fired power plants in Texas. As support for its request, EPA asserted "that 'policy changes legitimately instituted by the new administration led to a breakthrough in the relationship between EPA and Texas,'" and that EPA prefers to resolve its regulatory obligations through negotiations with the state. *NPCA,* slip op. at 7. The court rejected this reasoning, observing that since the Clean Air Act's 2007 deadline for complying with BART requirements, Texas repeatedly failed to develop an adequate state implementation plan. *Id.* "[T]he federal government *must* step in if a state's submissions are late

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or insufficient." *Id.* (emphasis original). In sum, *NPCA* affirmed that—a decade after the Clean Air Act's deadline for states to identify BART to reduce haze pollution—Congress's timetable overrides the new administration's preference to negotiate BART with states.

Here, as in *NPCA*, EPA had statutory and court-ordered deadlines for satisfying these same BART requirements for Utah's coal-fired power plants. EPA attempts to nullify these requirements by seeking to suspend this litigation while consenting to a stay of the Utah Haze Plan. This Court should deny the requested stay of the Utah Haze Plan and abeyance of these proceedings to ensure the timely reduction of haze-causing pollution from Utah sources as required by the Clean Air Act.

Sincerely,

/s/ Jenny K. Harbine
Jenny K. Harbine
Earthjustice
313 East Main Street
Bozeman, Montana 59715
(406) 586-9699 | Phone
(406) 586-9695 | Fax
jharbine@earthjustice.org

John Barth
Attorney at Law
P.O. Box 409
Hygiene, Colorado 80533
barthlawoffice@gmail.com

Counsel for Respondent-Intervenors HEAL Utah, National Parks Conservation Association, Sierra Club, and Utah Physicians for a Healthy Environment

CERTIFICATION FOR ECF PLEADING

I hereby certify with respect to the foregoing that all required privacy redactions have been made; that if required to file hard copies with the clerk's office, the ECF submission is an exact copy of those documents; and that the ECF submission was scanned for viruses with Kaspersky Endpoint Security 10 for Windows, version 10.2.5.3201 (last updated September 7, 2017), and according to the program is free of viruses.

Respectfully submitted September 7, 2017.

/s/ Jenny K. Harbine

CERTIFICATE OF SERVICE

I certify that on this 7th day of September, 2017, I electronically filed the foregoing with the Clerk of the Court for the United States Court of Appeals for the Tenth Circuit by using the appellate CM/ECF system, which will send notification of this filing to all attorneys of record.

/s/ Jenny K. Harbine

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

NATIONAL PARKS CONSERVATION ASSOCIATION, *et al.*, Plaintiffs, v. U.S. ENVIRONMENTAL PROTECTION AGENCY, *et al.*, Defendants.	Civil Action No. 11-1548 (ABJ)

ORDER

On August 29, 2011, plaintiffs filed this action asking the Court to order the Environmental Protection Agency to comply with its obligations under the Clean Air Act, in particular, its obligation to oversee the states' efforts to reduce pollution and haze, and sustain visibility, in the skies above national parks and other wilderness areas. In 2012, the parties entered into a consent decree establishing a schedule for the approval or creation of plans involving a number of affected states, and there is now one state left: Texas. The EPA is obligated under the consent decree to take action by September 9, 2017, and twenty-two days before that date, it sought leave to extend the deadline by more than fifteen months over plaintiffs' objection. Defendants' motion to amend the consent decree without consent will be denied.

One of the stated national goals of the Clean Air Act is "the prevention of any future, and the remedying of any existing, impairment of visibility" which "results from manmade pollution," in large parks and wilderness areas across the country. 42 U.S.C. § 7491(a)(1). The statute refers

to the parks and wilderness areas involved as "class I Federal areas." *Id.*[1] To achieve the statute's visibility goal, Congress announced in 1977 that states were required to develop plans, known as state implementation plans or SIPs,[2] containing "emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward the national goal." 42 U.S.C. § 7491(b)(2). The statute required that these state implementation plans would include a plan to install the "best available retrofit technology" at large aging pollution sources where emissions "may reasonably be anticipated to cause or contribute to any impairment of visibility" in any mandatory class I Federal area. 42 U.S.C. § 7491(b)(2)(A).

The 2004 amendments to the Clean Air Act set out a detailed process for states to submit, and EPA to review, the implementation plans required by the statute, *see* 42 U.S.C. § 7407, and the agency, at Congress's direction, set a deadline – December 17, 2007 – for states to submit the required plans. 42 U.S.C. § 7410(a)(1); 40 C.F.R. § 51.308(b).

If a state failed to submit a complete plan within six months of the plan's due date, the EPA was required by statute to make a finding to that effect. 42 U.S.C. § 7410(k)(1)(C).

If a state did submit a plan, EPA was required to determine within six months whether the submission was complete. 42 U.S.C. § 7410(k)(1)(B). If the plan was determined to be complete, EPA had one year to determine whether the plan comported with the law and to either approve or disapprove the plan, in whole or in part. 42 U.S.C. § 7410(k)(2)–(3). EPA is not authorized to

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1 The list of the specific parks and wilderness areas considered "class I Federal areas" is available at 40 C.F.R. part 81.

2 The Court of Appeals has cautioned parties to avoid "the use of acronyms other than those that are widely known." Handbook of Practice & Internal Procedures, United States Court of Appeals for the District of Columbia Circuit at 41. While the parties are intimately familiar with the innumerable acronyms in this case, the Court will endeavor to avoid acronyms like "SIP," "FIP," and "BART."

approve a plan "if the revision would interfere with any . . . applicable requirement" of the Clean Air Act. 42 U.S.C. § 7410(l).

In the Clean Air Act, Congress also specifically mandated that if EPA found that a state did not submit a plan by the applicable deadline, submitted an incomplete plan, or submitted a plan that violated the Act, it was required to issue a federal implementation plan, known as a "FIP," within two years of that finding, unless it approves a corrected state plan within that two-year timeframe. 42 U.S.C. § 7410(c)(1)(A)–(B).

In January 2009, EPA made a finding that Texas was one of thirty-four states that failed to submit a state implementation plan to EPA by the 2007 deadline. Finding of Failure to Submit State Implementation Plans Required by the 1999 Regional Haze Rule, 74 Fed. Reg. 2392–01, 2393 (Jan. 15, 2009). That finding "start[ed] the two year clock for the promulgation by EPA of a [federal implementation plan]." *Id.* So, according to the Clean Air Act, EPA was required to promulgate a federal implementation plan for Texas and the other states by January 15, 2011, unless the states submitted compliant state implementation plans in the interim. 42 U.S.C. § 7410(c)(1)(A)–(B).

Plaintiffs, a group of environmental organizations, filed this lawsuit on August 29, 2011 against EPA and the Administrator of the agency, alleging that EPA's failure to abide by its nondiscretionary duty to promulgate a federal implementation plan by the January 15, 2011 deadline violated the Clean Air Act. Compl. [Dkt. # 1]. On March 30, 2012, the parties entered into a partial consent decree, resolving the claims as to each state except for Florida. Partial Consent Decree [Dkt. # 21].[3] The Consent Decree included two significant deadlines related to Texas:

---

3 The claims against Florida were resolved in a separate agreement.

- **May 15, 2012:** EPA was required to "sign a notice(s) of proposed rulemaking in which it proposes approval of a [state implementation plan], promulgation of a [federal implementation plan], partial approval of a [state implementation plan] and promulgation of a partial [federal implementation plan], or approval of a [state implementation plan] or promulgation of a [federal implementation plan] in the alternative . . . that collectively meet the regional haze implementation requirements that were due by December 17, 2007 under EPA's regional haze regulations."

- **November 15, 2012:** EPA was required to "sign a notice(s) of final rulemaking promulgating a [federal implementation plan] . . . except where, by that date, EPA has or [Texas] has signed a notice of final rulemaking unconditionally approving a [state implementation plan], or promulgating a partial [federal implementation plan] and unconditional approval of a portion of a [state implementation plan], that collectively meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations."

Id. at ¶¶ 4–6, Table A. In the Consent Decree, the parties agreed that those deadlines could be extended for a period up to sixty days by agreement of the parties, but that any extensions for longer than sixty days would require Court approval, "upon motion made pursuant to the Federal Rules of Civil Procedure by EPA and upon consideration of any response by Plaintiffs and reply by EPA." *Id.* ¶ 7.

In the five years since the Consent Decree was entered, the parties have agreed to a number of extensions and amendments of the requirements for Texas.[4] Of particular relevance, on December 15, 2015, the Court granted EPA's unopposed motion to amend the consent decree. The amended consent decree provided that:

- By December 9, 2015, EPA must sign a notice of final rulemaking promulgating a federal implementation plan for Texas, unless EPA has signed by that date a notice of final rulemaking approving a state implementation plan or promulgating a partial federal implementation plan and unconditional approval of a partial state

4 Texas is the sole state with remaining deadlines, and EPA has otherwise fully complied with the terms of the Consent Decree.

implementation plan that collectively meet the requirements of t he Clean Air Act.

- The December 9, 2015 deadline would not apply "for the determination and adoption of requirements for best available retrofit technology ('BART') for electric generating units ('EGUs') in Texas." Instead, a final rulemaking promulgating a federal plan for those requirements would be due by December 9, 2016, unless a state plan or a partial state plan was approved and a partial f ederal plan promulgated by that date.

- The December 9, 2016 deadline could be extended to September 9, 2017 if by December 9, 2016, EPA signed a notice of proposed rulemaking proposing approval of a state plan, promulgation of a federal plan, partial approval of a state and a federal plan, or approval of a state plan or a federal plan in the alternative.

Order (Dec. 15, 2015) [Dkt. # 86].[5] EPA signed atimely notice of proposed rulemaking on January 4, 2017 which proposed to disapprove of certain aspects of Texas's state implementation plan, and proposed to promulgate a federal implementation plan to solve t he deficiency, so the September 9, 2017 deadline became the operative date for final action. P romulgation of Air Quality Implementation Plans; State of Te xas; Regional Haze & Interstat e Visibility Transport Federal Implementation Plan, 82 Fed. Reg. 912–01 (Jan. 4, 2017).

With three weeks left to go, on August 18, 2017, EPA filed a motion to amend the deadlines set out in the December 15, 2015 order. The agency seeks an extension of the September 9, 2017 deadline to December 31, 2018. EPA's Mot. to Amend the Consent Decree [Dkt. # 93] ("Mot."); EPA's Mem. in Supp. of Mot. [Dkt. # 93-1] ("Mem."). Plaintiffs oppose the motion, Pl.'s Mem. in Opp. to Mot. [Dkt. # 95], and the agency waived its right to file a reply. EPA's Unopposed Mot. to Expedite Consideration of Mot. [Dkt. # 92] at 1–2.

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5 The December 15, 2015 order was amended to correct a typographical error. *See* Order (Aug. 9, 2017) [Dkt. # 91].

Defendants premise their motion on Federal Rule of Civil Procedure 60(b)(5), Mot. at 1, which provides that "on motion and just terms, the court may relieve a party . . . from a final judgment, order, or proceeding . . . [if] applying it prospectively is no longer equitable." Fed. R. Civ. P. 60(b)(5). "[A] party seeking modification of a consent decree bears the burden of establishing that a significant change in circumstances warrants revision of the decree. If the moving party meets this standard, the court should consider whether the proposed modification is suitably tailored to the changed circumstance." *Rufo v. Inmates of the Suffolk Cty. Jail*, 502 U.S. 367, 383 (1992).

While the Supreme Court noted that the standard set forth in *Rufo* applies only "when a party seeks modification of a term of a consent decree that arguably relates to the vindication of a constitutional right," *id.* at 383 n.7, the D.C. Circuit has applied the *Rufo* standard to cases that do not implicate constitutional rights. *See NLRB v. Harris Teeter Supermarkets*, 215 F.3d 32, 35 (D.C. Cir. 2000) ("Although *Rufo* concerned the institutional reform of an instrumentality of government, we have applied the *Rufo* Rule 60(b)(5) equity analysis to other types of cases involving requests for consent decree modification."). According to the Court of Appeals, a district court can exercise its discretion to modify a consent decree: (1) "when changed factual conditions make compliance 'substantially more onerous,'" (2) when a decree "proves to be unworkable because of unforeseen obstacles," or (3) "when enforcement would be detrimental to the public interest." *Id.* at 35, quoting *Rufo*, 502 U.S. at 384; *see also Horne v. Flores*, 557 U.S. 433, 447 (2009).

Defendants have not carried their burden to show that any of the factors from *Rufo* are present here, or that it would be inequitable to enforce the terms of the judgment agreed to by the agency. Defendants point out that a "core principle" of the Clean Air Act is "cooperative

federalism," Mem. at 2, 10–11, citing *EPA v. EME Homer City Generation*, 134 S. Ct. 1584, 1602 n.14 (2014), and they assert that "policy changes legitimately instituted by the new administration led to a breakthrough in the relationship between EPA and Texas," and that, through that new relationship, the Governor of Texas has made a "firm commitment" to "bring the full weight and resources of the State of Texas to bear" on the development of an approvable state implementation plan. Mem. at 14; *see also* Decl. of Samuel J. Coleman [Dkt. # 93-2] at 7 (noting that continued negotiations between the EPA and Texas is the "[p]ace" to resolving EPA's consent decree obligations); Mem. of Agreement Between Texas Comm'n on Envtl. Quality & U.S. EPA [Dkt. # 93-2].

This is not the sort of significant change in circumstance that would warrant relief. Texas has been under the statutory obligation to comply with the Clean Air Act since at least 2007, and it has been on notice of EPA's finding that it had failed to comply with the requirement to submit a state implementation plan since 2009. So there has been quite a period of time during which "cooperative federalism" could take hold. This lawsuit, and the consent decree that followed, flowed directly from the state's delay in the face of its Clean Air Act obligations, and the plaintiffs were willing to agree, several times, to reasonable extensions. Texas has had ample time to develop, submit, and negotiate a compliant state implementation plan if that was its actual preference.

It is true that the cooperative federalism ideal is incorporated into the statutory scheme, which calls for state implementation plans to be the starting point. But the statute also mandates that the federal government *must* step in if a state's submissions are late or insufficient. *See, e.g.*, *Nat. Res. Def. Council v. Browner*, 57 F.3d 1122, 1124 (D.C. Cir. 1995) (holding that when a state fails to submit a compliant implementation plan, the Clean Air Act "rescinds state authority to

make the many sensitive technical and political choices that apollution control regime demands"); *see also Sierra Club v. EPA*, 356 F.3d 296, 298 (D.C. Cir. 2004) (holding that the EPA "was not authorized to grant conditional approval" to a state implementa tion plan "that did nothing more than promise to do tomorrow what the [Clean Air] Act requires t oday"). And here, while Texas has taken some steps to comply with the statute on various occa sions, those submissions have repeatedly been deemed to be inadequate by the federal officials.

Moreover, the request for the extension refers to communications between state and federal officials, but it does not indicate that the state's plan is anything other than conceptual at this time, and it does not call for anythi ng to be "proposed" until next M arch or "submitted" until October 2018. Coleman Decl. ¶ 16. These bare bones of a schedule leave the Court with little assurance that the work will be accomplished.[6]

Finally, EPA has not shown that compliance with the consent dec ree would be "more onerous" or that the settlement "has proven to be unworkable." EPA has represented that, if its motion is denied, it is ready to move forward with the publicat ion of the final rulemaking on September 9. 2d Decl. of Samuel J. Coleman [Dkt. # 94-1] ¶ 11 (averring that "the agency would meet the terms of the Partial Consent Decree and be prepared to sign for publication a notice promulgating a federal implementation plan (FIP), in the absence of an extension").

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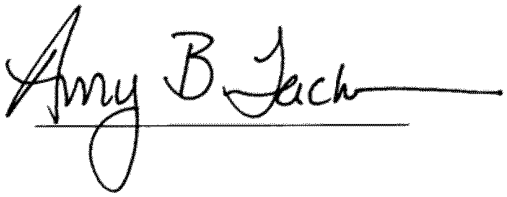
6 The Court's decision is based only on the record before it, in cluding the motion and supporting materials filed by the EPA on August 18 and 24, 2017 , and the timing of the Court's decision has been driven by the timing of the EPA's filing andhe looming deadline. But the Court would be remiss if it did not observe that the state of Texas is now dealing with a natural disaster of unprecedented scope, and that its officials will be justifia bly focused on relief and recovery measures for the foreseeable future.

The federal government must abide by its obligations to promulgate a federal implementation plan by the September 9, 2017 deadline. The motion to amend the judgment in this case over plaintiffs' well-founded objections will be denied.

CONCLUSION

Pursuant to Federal Rule of Civ il Procedure 60(b)(5), it is her eby **ORDERED** that defendants' motion to amend the consent decree is **DENIED**. Defendants shall, by September 9, 2017, (1) promulgate a federal implementation plan; (2) unconditionally approve a state implementation plan; or (3) promulgate a partial federal implementation plan and unconditionally approve a partial state implemen tation plan, to meet the "best available retrofit technology" requirement for electric generating units in Texas.

SO ORDERED.



AMY BERMAN JACKSON
United States District Judge

DATE: August 31, 2017

To: Lorang, Phil[Lorang.Phil@epa.gov]; Keas, Ashley[keas.ashley@epa.gov]; Jones, Rhea[Jones.Rhea@epa.gov]; Kornylak, Vera S.[Kornylak.Vera@epa.gov]
Cc: Werner, Christopher[Werner.Christopher@epa.gov]
From: Beaver, Melinda
Sent: Mon 9/11/2017 5:56:32 PM
Subject: FW: AIR POLLUTION: Court stays Utah haze plan in win for coal-fired utility

From: Casso, Ruben
Sent: Monday, September 11, 2017 1:42 PM
To: Beaver, Melinda <Beaver.Melinda@epa.gov>; Werner, Christopher <Werner.Christopher@epa.gov>
Subject: AIR POLLUTION: Court stays Utah haze plan in win for coal-fired utility

AIR POLLUTION: Court stays Utah haze plan in win for coal-fired utility

Sean Reilly, E&E News reporter

Published: Monday, September 11, 2017

A court has stayed U.S. EPA's regional haze plan for Utah; pictured is Salt Lake City. Eltiempo10/Wikimedia Commons

A federal appellate court has stayed an Obama administration plan intended to slash haze-forming emissions from two coal-fired power plants in Utah.

In an order this morning, a two-judge panel on the 10th U.S. Circuit Court of Appeals granted the request from PacifiCorp and the state to pause the U.S. EPA regional haze plan published in July 2016.

The Trump administration earlier this year agreed to revisit that plan; in today's order, the two-judge panel also froze proceedings on related legal challenges, saying it would waste resources to move ahead in light of EPA's decision to reconsider the original 2016 regulations.

The order marks the latest victory for power companies and states who had challenged the Obama administration's approach to running the regional haze program, which was created under the Clean Air Act to restore natural visibility to 156 national parks and wilderness areas by 2064.

EPA imposed the Utah plan last year after concluding the state's strategy didn't do enough to cut releases of nitrogen oxides (NOx) from PacifiCorp's Hunter and Huntington facilities in central Utah.

In a phone interview this morning, PacifiCorp spokesman David Eskelsen reiterated the company's view that the state plan met regional haze requirements and "should have been approved."

Michael Shea of HEAL Utah, an environmental group that had opposed the stay request, decried the

court's decision.

"It's a little bit baffling that the EPA is going back on its own research and reformulating a new plan," he said in a separate interview.

In issuing the plan last year, EPA had predicted it would eventually cut NOx releases by almost 10,000 tons annually and improve views in eight national parks. But Utah's air quality chief had argued that the tighter controls would yield little visibility improvement in return for a projected $700 million price tag.

The state found a sympathetic listener in EPA Administrator Scott Pruitt. As Oklahoma attorney general, the Republican fought an unsuccessful three-year legal battle against an EPA haze plan for his state. In July, Pruitt hand-delivered a letter signaling EPA's decision to reconsider the plan to Utah Gov. Gary Herbert (R), according to *The Salt Lake Tribute*.

On a related front, EPA today published a proposed rule to withdraw a separate NOx reduction plan for Arkansas that has also been contested by utilities and state officials. The proposal, which would apply mainly to plants owned by Entergy Corp., has a 30-day comment period ending Oct. 11.