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40 CFR Part 52

Approval, Disapproval and Promulgation of Air Quality Implementation Plans; Arizona; Regional Haze State and Federal Implementation Plans; Final Rule

**ENVIRONMENTAL PROTECTION AGENCY****40 CFR Part 52**

[EPA-R09-OAR-2012-0021, FRL-9754-3]

**Approval, Disapproval and Promulgation of Air Quality Implementation Plans; Arizona; Regional Haze State and Federal Implementation Plans****AGENCY:** Environmental Protection Agency (EPA).**ACTION:** Final rule.

**SUMMARY:** EPA is taking final action to approve in part and disapprove in part a portion of Arizona's State Implementation Plan (SIP) submittal for its regional haze program and to promulgate a Federal Implementation Plan (FIP) for the disapproved elements of the SIP. The State and Federal plans are to implement the regional haze program in Arizona for the first planning period through 2018. This final rule addresses only the portion of the SIP related to Arizona's determination of Best Available Retrofit Technology (BART) to control emissions from eight units at three electric generating stations: Apache Generating Station, Cholla Power Plant and Coronado Generating Station. Consistent with our proposal, EPA approves in this final rule the State's determination that the three sources are subject to BART, and approves the State's emissions limits for sulfur dioxide (SO<sub>2</sub>) and particulate matter less than or equal to 10 micrometers (PM<sub>10</sub>) at all the units, but disapproves Arizona's BART emissions limits for nitrogen oxides (NO<sub>x</sub>) at the coal-fired units of the three power plants. We also are promulgating a FIP that contains new emissions limits for NO<sub>x</sub> at these coal-fired units and compliance schedules for implementation of BART as well as requirements for equipment maintenance, monitoring, recordkeeping and reporting for all units and all pollutants at the three sources. In today's action, we are revising some elements of the proposed FIP in response to comments and additional information that we received.

**DATES:** *Effective date:* This rule is effective January 4, 2013.

*Compliance dates:* The owners/operators of each unit subject to this final rule shall comply by the dates specified in the regulatory text.

**ADDRESSES:** EPA has established docket number EPA-R09-OAR-2012-0021 for this action. Generally, documents in the docket are available electronically at

<http://www.regulations.gov> or in hard copy at EPA Region 9, 75 Hawthorne Street, San Francisco, California. Please note that while many of the documents in the docket are listed at <http://www.regulations.gov>, some information may not be specifically listed in the index to the docket and may be publicly available only at the hard copy location (e.g., copyrighted material, large maps, multi-volume reports or otherwise voluminous materials), and some may not be available at either locations (e.g., confidential business information). To inspect the hard copy materials, please schedule an appointment during normal business hours with the contact listed directly below.

**FOR FURTHER INFORMATION CONTACT:**

Thomas Webb, U.S. EPA, Region 9, Planning Office, Air Division, Air-2, 75 Hawthorne Street, San Francisco, CA 94105. Thomas Webb can be reached at telephone number (415) 947-4139 and via electronic mail at [webb.thomas@epa.gov](mailto:webb.thomas@epa.gov).

**SUPPLEMENTARY INFORMATION:**

Throughout this document, wherever "we," "us," or "our," is used, we mean the United States Environmental Protection Agency (EPA).

**Definitions**

For the purpose of this document, we are giving meaning to certain words or initials as follows:

- (1) The words or initials *CAA* or *Act* mean or refer to the Clean Air Act, unless the context indicates otherwise.
- (2) The initials *ACC* refer to the Arizona Corporation Commission.
- (3) The initials *ACCCE* mean or refer to American Coalition for Clean Coal Electricity.
- (4) The initials *ADEQ* mean or refer to the Arizona Department of Environmental Quality.
- (5) The initials *AEPCO* mean or refer to Arizona Electric Power Cooperative.
- (6) The initials *AFUDC* mean or refer to allowance for funds used during construction.
- (7) The term *Apache* refers to Apache Generating Station.
- (8) The initials *APS* mean or refer to Arizona Public Service Company.
- (9) The words *Arizona* and *State* mean the State of Arizona.
- (10) The initials *BART* mean or refer to Best Available Retrofit Technology.
- (11) The term *BART units* refers to Apache Generating Station Units 1, 2 and 3; Cholla Power Plant Units 2, 3 and 4 and Coronado Generating Station Units 1 and 2.
- (12) The initials *CBI* mean or refer to Confidential Business Information.
- (13) The initials *CCM* mean or refer to EPA's Cost Control Manual.

(14) The initials *CEMS* mean or refer to continuous emission monitoring system.

(15) The term *Cholla* refers to Cholla Power Plant.

(16) The term *Class I area* refers to a mandatory Class I Federal area.<sup>1</sup>

(17) The term *coal-fired BART units* refers to Apache Generating Station Units 2 and 3; Cholla Power Plant Units 2, 3 and 4 and Coronado Generating Station Units 1 and 2.

(18) The initials *COFA* mean or refer to close-coupled overfire air.

(19) The term *Coronado* refers to Coronado Generating Station.

(20) The initials *CY* mean or refer to Calendar Year.

(21) The initials *EGU* mean or refer to Electric Generating Unit.

(22) The initials *ESPs* mean or refer to electrostatic precipitators.

(23) The words *EPA*, *we*, *us* or *our* mean or refer to the United States Environmental Protection Agency.

(24) The initials *FGD* mean or refer to flue gas desulfurization.

(25) The initials *FGR* mean or refer to flue gas recirculation.

(26) The initials *FIP* mean or refer to Federal Implementation Plan.

(27) The initials *FLMs* mean or refer to Federal Land Managers.

(28) The initials *FR* mean or refer to the **Federal Register**.

(29) The initials *GEP* mean or refer to Good Engineering Practice.

(30) The initials *IMPROVE* mean or refer to Interagency Monitoring of Protected Visual Environments monitoring network.

(31) The initials *IWAQM* mean or refer to Interagency Workgroup on Air Quality Modeling.

(32) The initials *IPM* mean or refer to Integrated Planning Model.

(33) The initials *LNB* mean or refer to low-NO<sub>x</sub> burners.

(34) The initials *LTS* mean or refer to Long-Term Strategy.

(35) The initials *MMBtu* mean or refer to Million British thermal units.

(36) The initials *MW* mean or refer to megawatts.

(37) The initials *MWh* mean or refer to megawatt hours.

(38) The initials *NEI* mean or refer to National Emission Inventory.

(39) The initials *NH<sub>3</sub>* mean or refer to ammonia.

(40) The initials *NO<sub>x</sub>* mean or refer to nitrogen oxides.

(41) The initials *NP* mean or refer to National Park.

<sup>1</sup> Although states and tribes may designate as Class I additional areas which they consider to have visibility as an important value, the requirements of the visibility program set forth in section 169A of the CAA apply only to "mandatory Class I Federal areas."

(42) The initials *NPRM* mean or refer to Notice of Proposed Rulemaking.

(43) The initials *O&M* mean or refer to operation and maintenance.

(44) The initials *OC* mean or refer to organic carbon.

(45) The initials *OFA* mean or refer to over fire air.

(46) The initials *PM* mean or refer to particulate matter.

(47) The initials *PM<sub>10</sub>* mean or refer to particulate matter with an aerodynamic diameter of less than 10 micrometers (coarse particulate matter).

(48) The initials *PM<sub>2.5</sub>* mean or refer to fine particulate matter with an aerodynamic diameter of less than 2.5 micrometers.

(49) The initials *PNG* mean or refer to pipeline natural gas.

(50) The initials *ppm* mean or refer to parts per million.

(51) The initials *PSD* mean or refer to Prevention of Significant Deterioration.

(52) The initials *RACT* mean or refer to Reasonably Available Control Technology.

(53) The initials *RAVI* mean or refer to Reasonably Attributable Visibility Impairment.

(54) The initials *RATA* mean or refer to relative accuracy test audit.

(55) The initials *RHR* mean or refer to the Regional Haze Rule, originally promulgated in 1999 and codified at 40 CFR 51.301–309.

(56) The initials *RMB* refer to RMB Consulting & Research, Inc.

(57) The initials *RMC* mean or refer to Regional Modeling Center.

(58) The initials *RP* mean or refer to Reasonable Progress.

(59) The initials *RPG* or *RPGs* mean or refer to Reasonable Progress Goal(s).

(60) The initials *RPOs* mean or refer to regional planning organizations.

(61) The initials *SCR* mean or refer to Selective Catalytic Reduction.

(62) The initials *SIP* mean or refer to State Implementation Plan.

(63) The initials *SNCR* mean or refer to Selective Non-catalytic Reduction.

(64) The initials *SO<sub>2</sub>* mean or refer to sulfur dioxide.

(65) The initials *SOFA* mean or refer to separated over fire air.

(66) The initials *SRP* mean or refer to Salt River Project Agricultural Improvement and Power District.

(67) The initials *TCI* mean or refer to total capital investment.

(68) The initials *tpy* mean tons per year.

(69) The initials *TSD* mean or refer to Technical Support Document.

(70) The initials *VOC* mean or refer to volatile organic compounds.

(71) The initials *WA* mean or refer to Wilderness Area.

(72) The initials *WEP* mean or refer to Weighted Emissions Potential.

(73) The initials *WFGD* mean or refer to wet flue gas desulfurization.

(74) The initials *WRAP* mean or refer to the Western Regional Air Partnership.

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## I. Background

### A. Summary of Our Proposed Action

Our notice of proposed rulemaking (NPRM) was signed on July 2, 2012, and was published in the **Federal Register** on July 20, 2012.<sup>2</sup> In that notice, we proposed to approve in part and disapprove in part a portion of Arizona's Regional Haze SIP (submitted on February 28, 2011) and proposed a FIP to address the deficiencies in the disapproved portions of the SIP. The proposed rule addressed the BART requirements for eight units at three electric generating stations: Arizona Electric Power Company's (AEP) Apache Generating Station (Apache) Units 1, 2 and 3; Arizona Public Service's (APS) Cholla Power Plant (Cholla) Units 2, 3 and 4; and Salt River Project's (SRP) Coronado Generating Station (Coronado) Units 1 and 2. We did not propose action on any other part of Arizona's SIP related to the remaining requirements of the Regional Haze Rule (RHR). In summary, we proposed the following:

*Proposed Approval:* We proposed to approve Arizona's determination that the following sources and units are subject to BART: Apache Units 1, 2 and 3; Cholla Units 2, 3 and 4; and Coronado Units 1 and 2 (collectively "BART units"). We proposed to approve Arizona's BART emissions limits for SO<sub>2</sub> and PM<sub>10</sub> at all three sources and units and the emissions limit for NO<sub>x</sub> at Apache Unit 1.

*Proposed Disapproval:* We proposed to disapprove Arizona's BART

emissions limits for NO<sub>x</sub> at all of the coal-fired BART units (i.e., all of the BART units except for Apache Unit 1). We also proposed to disapprove the compliance schedules and requirements for equipment maintenance and operation, including monitoring, recordkeeping and reporting requirements for BART at all of the BART units, since these were not included in the SIP submittal.

*Proposed FIP:* The proposed FIP contained BART emissions limits for NO<sub>x</sub> at all of the coal-fired BART units, as well as compliance deadlines and requirements for equipment maintenance and operation, including monitoring, recordkeeping and reporting, to ensure the enforceability of the BART limits for all of the BART units. Because our proposed FIP emission limits would likely result in changes in stack conditions from those anticipated in the SIP, we invited comment on whether an alternative test method to the one required in the SIP is acceptable for PM<sub>10</sub>. In addition, we specifically sought comment on whether we should require lower SO<sub>2</sub> emissions limits or removal efficiency requirements for any of the coal-fired BART units. Finally, in the regulatory text in our NPRM, we proposed to incorporate by reference into the FIP two provisions of the Arizona Administrative Code, R18–2–310 and R18–2–310.01, which we characterized as establishing an affirmative defense for excess emissions due to malfunctions.<sup>3</sup>

### B. Legal Basis for Our Final Action

Our action is based on an evaluation of Arizona's Regional Haze SIP submitted on February 28, 2011, to meet the requirements of Section 308 of the RHR. We evaluated the SIP against the requirements of the RHR and Clean Air Act (CAA) sections 169A and 169B. We also applied the general SIP requirements in CAA section 110. Our authority for action on Arizona's Regional Haze SIP is based on CAA section 110(k). Our authority to promulgate a FIP is based on CAA section 110(c).

## II. Overview of Final Action

EPA is taking final action to approve in part and disapprove in part a portion of Arizona's SIP for Regional Haze, and to promulgate a FIP for the disapproved elements of the SIP. This final rule only addresses the BART requirements for the eight BART units identified above.

<sup>3</sup> Those provisions also include an affirmative defense for excess emissions due to startups and shutdowns, which we did not intend to incorporate.

Most notably, and with the exception of Apache Unit 1, the FIP includes NO<sub>x</sub> emission limits for all the units that are achievable with SCR. At this time, EPA is not taking action on the State's other BART determinations or any other parts of the SIP regarding the remaining requirements of the RHR.

EPA takes very seriously a decision to disapprove any state plan. To approve a state plan, EPA must be able to find that the state plan is consistent with the requirements of the CAA and EPA's regulations. Further, EPA's oversight role requires us to ensure fair implementation of CAA requirements by states across the country, even while acknowledging that individual decisions from source to source or state to state may not have identical outcomes. In this instance, for the reasons described in our proposal and in this document, we find that the State's NO<sub>x</sub> BART determinations for the coal-fired units are not consistent with the applicable statutory and regulatory requirements. Furthermore, the Arizona Regional Haze SIP does not include the necessary compliance schedules and requirements for equipment maintenance and operation, including monitoring, recordkeeping and reporting requirements for BART. As a result, EPA believes this final disapproval is the only path that is consistent with the Act at this time.

We encourage the State to submit a revised SIP to replace all portions of our FIP, and are ready to work with the State to develop a revised plan. The CAA requires states to prevent any future and remedy any existing man-made impairment of visibility in 156 national parks and wilderness areas designated as Class I areas. Arizona has a wealth of such areas. The three power plants affect visibility at 18 national parks and wilderness areas, including the Grand Canyon, Mesa Verde and the Petrified Forest. The State and EPA must work together to ensure that plans are in place to make progress toward natural visibility conditions at these national treasures.

### III. Final BART Determinations

This section is a summary of EPA's final action on the BART determinations for the BART units at Apache, Cholla and Coronado electric generating stations. Please refer to Table 1 that compares this final rule to the proposal that was published on July 20, 2012. Where EPA has modified our proposal to respond to comments or additional information, we explain our analysis in the next section titled "EPA's Responses to Comments." We have fully considered all comments on our

proposal, and have concluded that some changes are warranted based on public comments and additional information we received in response to questions raised in the proposal.

*Final Approval:* EPA is approving Arizona's determination that the following sources and units are subject to BART: Apache Units 1, 2 and 3; Cholla Units 2, 3 and 4; and Coronado Units 1 and 2 (collectively "BART units"). We are approving the emissions limits for NO<sub>x</sub>, PM<sub>10</sub> and SO<sub>2</sub> at Apache Unit 1 as proposed. We are approving the State's emissions limits for PM<sub>10</sub> and SO<sub>2</sub> for all the units.

*Final Disapproval:* Based on our evaluation described in the proposal and in this document, we are disapproving the State's BART emissions limits for NO<sub>x</sub> at all the BART units except for Apache Unit 1, for which the SIP's BART determination consists of fuel switching to pipeline natural gas (PNG). We also are disapproving the compliance schedules and requirements for equipment maintenance and operation, including monitoring, recordkeeping and reporting requirements for BART at all the BART units since these were not included in the Arizona Regional Haze SIP.<sup>4</sup>

*Final Federal Implementation Plan:* We are promulgating a FIP that includes emissions limitations representing BART for NO<sub>x</sub> at all the coal-fired BART units. The FIP also includes compliance schedules and requirements for equipment maintenance, monitoring, testing, recordkeeping and reporting for all the BART units. For PM<sub>10</sub> at all units, we allow the use of Method 5 as an alternative to Method 201A/202. In addition, the FIP includes a removal efficiency requirement for SO<sub>2</sub> on Cholla Units 2, 3 and 4, which will ensure that the scrubbers on these units are properly operated and maintained. Finally, we are incorporating into the FIP an affirmative defense provision for excess emissions due to malfunctions.<sup>5</sup>

<sup>4</sup>For each BART source, the SIP must include a requirement to install and operate control equipment as expeditiously as practicable (40 CFR 51.308(e)(1)(iv)); a requirement to maintain control equipment (40 CFR 51.308(e)(1)(v)); and procedures to ensure control equipment is properly operated and maintained, including requirements for monitoring, recordkeeping and reporting (40 CFR 51.308(e)(1)(v)).

<sup>5</sup>In the regulatory text in our NPRM, we proposed to incorporate by reference into the FIP two provisions of the Arizona Administrative Code, R18-2-310 and R18-2-310.01, which we characterized as establishing an affirmative defense for excess emissions due to malfunctions. However, those provisions also include an affirmative defense for excess emissions due to startups and shutdowns, which we did not intend to incorporate. As explained below, the emission limits that we are

We have revised certain elements of our proposed FIP based on public comments and additional information as follows:

- *Apache Units 2 and 3:* The final emissions limit for NO<sub>x</sub> is 0.070 pounds per million British thermal units (lb/MMBtu) determined as an average of the two units, based on a rolling 30-boiler-operating-day average. Compared to the proposed emissions limit of 0.050 lb/MMBtu on each unit, this higher limit and the addition of a two-unit average provides an extra margin of compliance to account for periods of startup and shutdown as well as additional operational flexibility for Apache given AEPCO's status as a small entity. When either one of the two units is not operating, its emissions from its own preceding thirty boiler-operating-days will continue to be included in the two-unit average. The final compliance date for this NO<sub>x</sub> limit remains five years from the date of publication of this final rule. For SO<sub>2</sub> and PM<sub>10</sub> we are extending the compliance deadline to four years from publication of this final rule in order to provide AEPCO with sufficient time to implement upgrades to the existing scrubbers and electrostatic precipitators (ESPs) at these units.

- *Cholla Units 2, 3 and 4:* The final emissions limit for NO<sub>x</sub> is 0.055 lb/MMBtu determined as an average of the three units, based on a rolling 30-boiler-operating-day average. Compared to the proposed emissions limit of 0.050 lb/MMBtu on each unit, the higher limit and three-unit average provide an extra margin of compliance to account for periods of startup and shutdown. When any of the three units is not operating, its emissions from its own preceding thirty boiler-operating-days will continue to be included in the three-unit average. As proposed, the final compliance date to install and operate controls is five years from the date of publication of this final rule. For SO<sub>2</sub>, we are adding a removal efficiency requirement of 95 percent for the scrubbers on Cholla Units 2, 3 and 4, in order to ensure that these scrubbers are properly operated and maintained, consistent with 40 CFR 51.308(e)(1)(v). We are retaining the other compliance deadlines as proposed, except for Cholla Unit 2, where we are extending the

promulgating today include an adequate margin of compliance to account for periods of startup and shutdown. Accordingly, as indicated by the title of this provision in our proposed regulatory text ("Affirmative Defense for Malfunctions"), we are only incorporating into the FIP the malfunction-related provisions of these rules and not the startup and shutdown provisions. Our final regulatory text clarifies this distinction and also incorporates the definition of malfunction.

compliance deadline to April 1, 2016, for both SO<sub>2</sub> and PM<sub>10</sub> in order to provide APS with sufficient time to install a new wet flue gas desulfurization (FGD) system and fabric filter on this unit.

- *Coronado Units 1 and 2*: The final emissions limit for NO<sub>x</sub> is 0.065 lb/

MMBtu determined as an average of the two units, based on a rolling 30-boiler-operating-day average. Compared to the proposed emissions limits of 0.050 on Unit 1 and 0.080 on Unit 2, this new limit based on a two-unit average provides an extra margin of compliance to account for startup and shutdown.

When either one of the two units is not operating, its emissions from its own preceding thirty boiler-operating-days will continue to be included in the two-unit average. The final compliance date for the two units is five years from the date of publication of this final rule.

TABLE 1—SUMMARY OF CHANGES FROM PROPOSAL TO FINAL RULE: EMISSIONS LIMITS (LB/MMBTU) AND COMPLIANCE DATES IN SIP AND FIP

Source	NO <sub>x</sub>		PM <sub>10</sub>		SO <sub>2</sub>	
	Proposal	Final	Proposal	Final	Proposal	Final
Apache Unit 1 ....	0.056, Five years	0.056, Five years	0.0075, 180 days	0.0075, 180 days	0.00064, 180 days	0.00064, 180 days.
Apache Unit 2 ....	0.050, Five years	0.070 (across two units)	0.03, 180 days .....	0.03, Four years	0.15, 180 days .....	0.15, Four years.
Apache Unit 3 ....	0.050, Five years	Five years	0.03, 180 days .....	0.03, Four years	0.15, 180 days .....	0.15, Four years.
Cholla Unit 2 .....	0.050, Five years	0.055 (across three units)	0.015, Jan 1, 2015	0.015, Apr 1, 2016	0.15, 180 days .....	Add 95 percent efficiency Apr 1, 2016.
Cholla Unit 3 .....	0.050, Five years	Five years	0.015, 180 days ...	0.015, 180 days	0.15, 180 days .....	Add 95 percent efficiency 1 year.
Cholla Unit 4 .....	0.050, Five years		0.015, 180 days ...	0.015, 180 days	0.15, 180 days .....	Add 95 percent efficiency 1 year.
Coronado Unit 1	0.050, Five years	0.065 (across two units)	0.03, 180 days .....	0.03, 180 days	0.08, 180 days .....	0.08, 180 days.
Coronado Unit 2	0.080, June 1, 2014.	Five years	0.03, 180 days .....	0.03, 180 days	0.08, 180 days .....	0.08, 180 days.

**IV. EPA’s Responses to Comments**

We are responding to comments on our proposed rule published on July 20, 2012.<sup>6</sup> We held an initial public hearing in Phoenix, Arizona, on July 31, 2012. In response to concerns that more time was needed to analyze the proposal and develop comments, we added two additional public hearings in Holbrook and in Benson, Arizona, on August 14 and 15, respectively, and extended the public comment deadline to September 18, 2012.<sup>7</sup> The three public hearings were attended by hundreds of citizens, local and state government officials, workers and officials from the power plants, and representatives from environmental organizations. Testimony and comments from the three public hearings are organized in the docket by location and available for viewing at [www.epa.gov/region9/air/actions/arizona.html](http://www.epa.gov/region9/air/actions/arizona.html) and <http://www.regulations.gov>.

We also received a number of written comments, including extensive comments from stakeholders and government agencies who offered policy and technical analyses addressing the details of our proposed rule. These stakeholders included AEPSCO, APS, SRP, PacifiCorp, Arizona Utilities Group (AUG), National Park Service (NPS),

Arizona Department of Environmental Quality (ADEQ), and a consortium of conservation organizations (National Parks Conservation Association, Sierra Club, Physicians for Social Responsibility—Arizona Chapter, Dine’ Citizens Against Ruining Our Environment, Grand Canyon Trust, and San Juan Citizens Alliance) represented by Earthjustice. All of the comments we received along with attached technical reports and analyses are available for review in the docket.

*A. General Comments on ADEQ’s Approach to BART*

1. ADEQ’s Identification of BART Sources

*Comment:* One commenter (Earthjustice) stated that EPA must provide further factual support for its determination that Cholla Unit 1 is not BART-eligible. The commenter indicated that the record lacks the requisite support for this conclusion. Recounting the history of ADEQ’s finding that Unit 1 is not BART-eligible, the commenter noted that APS claimed, and ADEQ concurred, that Unit 1 is not BART-eligible based on a 50-year-old document entitled “Operating Notes For May 1962” which allegedly shows that Unit 1 began operations on May 1, 1962, and was thus placed into operation just months before the August 7, 1962, BART-eligibility cut-off. The commenter

added that EPA apparently approved, without any scrutiny, ADEQ’s determination that Cholla Unit 1 is not BART-eligible.

The commenter (Earthjustice) requested that EPA properly analyze the BART-eligibility of Cholla Unit 1. Specifically, the commenter requested that EPA identify which “aspects of the process by which ADEQ identified its eligible-for-BART and subject-to-BART sources” it disagrees with, the basis of each disagreement, and whether any such disagreement implicates Cholla Unit 1. In addition, the commenter stated that EPA’s independent analysis of this issue must be supported by the following information, which is needed to verify the actual date that Cholla Unit 1 began operating:

- The document entitled “Operating Notes for May 1962” referenced in ADEQ’s SIP;
- All available 1962 operating records for Cholla Unit 1;
- All initial CAA construction and operating permits issued to Cholla Unit 1;
- All emissions data from the year 1962 for Cholla Unit 1;
- Notes of the meeting between ADEQ and APS in August 2007 or any other time ADEQ and APS discussed the BART-eligibility of Cholla Unit 1; and
- Any other documentation that either supports or contradicts whether Cholla Unit 1 was placed into

<sup>6</sup> 77 FR 42834.

<sup>7</sup> 77 FR 45326 (July 31, 2012).

commercial operation before August 7, 1962.

*Response:* We did not specifically propose to take action on ADEQ's determination that Cholla Unit 1 is not BART-eligible and our statement that "we do not agree with all aspects of the process by which ADEQ identified its eligible-for-BART and subject-to-BART sources" was not intended to apply to this unit. Nonetheless, we agree with the commenter that it is appropriate to give some consideration to this issue in the context of today's rulemaking action, which covers ADEQ's BART determinations for the other three units at Cholla.

Contrary to the commenter's assertion, the WRAP did not find Cholla Unit 1 subject to BART. The WRAP document cited by the commenter merely indicates that ADEQ notified APS on July 13, 2007 that Cholla Units 1–4 were "Potentially Subject to BART."<sup>8</sup> The WRAP's "Arizona BART Eligibility TSD" further explains that:

[Cholla] Unit 1 is listed as potentially date eligible as information shows that the emissions unit was in service only 2 months prior to the cut-off date. Recommend requesting additional supporting documentation for final determination.<sup>9</sup>

ADEQ received this additional documentation from APS in August 2007 in the form of a document dated May 23, 1962, and entitled "Operating Notes For May 1962."<sup>10</sup> This document indicates that, "[o]n Tuesday, May 1, 1962, unit [#1 was] placed into commercial operation."<sup>11</sup> After reviewing this documentation, ADEQ concurred that Unit 1 was not BART eligible.<sup>12</sup>

Following the close of the public comment period, we requested and received from APS a copy of the "Operating Notes For May 1962" along with additional information concerning the operation of Cholla Unit 1.<sup>13</sup> We have placed these materials in the docket and, based on our initial review, we believe this documentation is sufficient to confirm ADEQ's determination that this unit is not BART-eligible. However, because this question was not addressed in our proposed rulemaking, we are not taking final action on it at this time. We intend to address Cholla Unit 1's BART

eligibility when we take action on the remainder of the Arizona Regional Haze SIP.

## 2. ADEQ's BART Control Analyses

*Comment:* One commenter (PacifiCorp) states that EPA improperly focuses on only two factors, costs and visibility improvement, in rejecting the ADEQ's entire NO<sub>x</sub> BART determination. The commenter states that EPA inappropriately places more weight on these factors.

*Response:* EPA disagrees with the comment that we inappropriately focused on costs and visibility improvement in our decision to disapprove ADEQ's NO<sub>x</sub> BART determinations. As outlined in our proposal, we considered ADEQ's evaluation of the energy and non-air quality environmental impacts of compliance of the control technologies, any existing pollution control technology in use at each of the sources, and the remaining useful life of each source, to be generally reasonable and consistent with the RHR and the BART Guidelines.<sup>14</sup> However, we also found that the costs of control were not calculated in accordance with the BART Guidelines, and that the visibility impacts were not appropriately evaluated and considered. These findings formed part of the basis for our disapproval of ADEQ's NO<sub>x</sub> BART determinations.

*Comment:* Several commenters objected to EPA's use of non-specific and undefined parameter levels for both the "cost-effectiveness" and "sufficient visibility improvement" parameters in rejecting ADEQ's SIP. One commenter (PacifiCorp) further noted that states cannot meet EPA's specific targets unless and until those targets are clearly defined.

*Response:* The RHR and the BART Guidelines do not require the development of specific thresholds, but rather require evaluation of each BART determination on a case-by-case basis for each source.<sup>15</sup> We have not established a specific cost threshold that makes a particular control option BART based on just a dollars per ton number, and there is not a specific target, either in terms of cost-effectiveness or visibility improvement, for ADEQ to meet. All five factors must be evaluated and weighed to determine the level of

control that is BART on a case-by-case basis.

### a. ADEQ's Approach to Costs of Compliance

*Comment:* One commenter (NPS) agreed with EPA's conclusions that the costs of control were not calculated by ADEQ in accordance with the BART Guidelines and that costs were included for items not allowed by EPA Control Cost Manual (CCM or the Manual) (e.g., owner's costs, surcharge, escalation, and Allowance for Funds Utilized During Construction—AFUDC), which inflates the total cost of compliance and the cost per ton of pollutant reduced. According to the commenter, a review of industry data (detailed in Appendix A of the commenter's submission) indicates that the total capital investment (TCI) for SCR retrofits is typically about \$200/kW, while the TCI estimates for Apache and Cholla equaled or exceeded \$250/kW.

The commenter (NPS) noted that the BART Guidelines recommend use of the Manual if vendor data are not available. The commenter conducted detailed cost analyses of SCR using an approach that the commenter believes is similar to that used by EPA in its evaluation of SCR on the Colstrip power plant—using the cost methodologies of the Manual and relying on EPA's Integrated Planning Model (IPM) to reflect the most recent cost levels. The commenter observed that most of the ADEQ SCR cost estimates were based on TCI costs that were relatively high ratios of the reported direct capital costs (DCC). The commenter indicated that according to the Manual, the ratio of TCI to DCC is 141 percent, while ADEQ's estimates were as follows:

- At Apache, TCI is 179 percent of DCC for both units and included \$6 million in costs for each unit not typically allowed by EPA.
  - At Cholla, TCI is 258 percent of DCC for all three units and included \$11 million in costs for Units 2 and 3 (each) and \$15 million for Unit 4 that are not typically allowed by EPA.
  - At Coronado, data were not sufficient to calculate these values.
- The commenter asserted that this supports EPA's concern that control costs submitted by the utilities either included costs not typically allowed by EPA or were inadequately documented.

*Response:* We appreciate the information provided by the National Park Service and are in agreement that ADEQ's cost estimates of SCR are overestimated. As indicated in our proposal, our cost estimates for SCR generally produced lower values than those in the Arizona Regional Haze SIP,

<sup>8</sup> Exhibit 17 to Earthjustice Comments, WRAP BART Clearinghouse (Oct. 24, 2008).

<sup>9</sup> "Supporting Documentation on Emissions Unit Bart Eligibility Analysis", section 5.1.2.

<sup>10</sup> Arizona Regional Haze SIP at page 155.

<sup>11</sup> *Id.*

<sup>12</sup> *Id.*

<sup>13</sup> Email from Sue Kidd, APS, to Colleen McKaughan, EPA (October 10, 2012, 9:17 a.m.) and attachments.

<sup>14</sup> See 77 FR 42841.

<sup>15</sup> See, e.g., BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.5 ("a 0.3 deciview improvement may merit a stronger weighting in one case versus another, so one "bright line" may not be appropriate.")

and at a level that we consider cost-effective. Although we recognize that NPS's estimates produce even lower values than those from our proposal, we have not updated our own cost estimates to reflect NPS's comments since we already consider SCR to be cost-effective. We do note that in order to address the comments from the utilities, we have performed supplemental cost analyses for each facility based on the costs provided by the utilities, and in doing so have accounted for those costs not allowed by CCM methodology.

*Comment:* Two commenters (ADEQ and AUG) stated that EPA did not and cannot show that ADEQ failed to consider relevant cost information in making its BART determination, the State fully complied with its CAA obligations, and EPA's rationale is insufficient to reject ADEQ's cost determinations. AUG asserted that:

Arizona has expressly stated that it has considered each of the BART factors. EPA plainly cannot—and does not—demonstrate that Arizona failed to take the costs of compliance with BART emission limits into consideration. The state is required to do no more than that, and EPA cannot lawfully disapprove the state's determinations on the basis that the Agency would prefer a different form of, or format for, explanation of those determinations.

The commenters further stated that the other reason EPA rejected ADEQ's cost determinations is that EPA believed that ADEQ relied on inadequately documented costs. The commenters contended that there is nothing in the CAA or BART rules that requires a state to present any particular level of cost documentation or that limits a state's discretion in its consideration of the cost factor in making a BART determination.

*Response:* We disagree with this comment. First, while Arizona may have "expressly stated" that it considered each of the BART factors, it must do more than "state" that it considered a BART factor, but must also provide some type of analysis demonstrating that it considered the BART factors.<sup>16</sup> Although ADEQ has presented information relevant to each of the BART factors, it has not provided an explanation regarding how this information was used to develop its BART determinations. Specifically in the case of cost calculations, the Arizona Regional Haze SIP includes

relevant information for multiple NO<sub>x</sub> control options, but does not provide evidence that this information has been analyzed in any way. In the case of Apache and Coronado, the Arizona Regional Haze SIP does not analyze this cost information in even a qualitative manner. In the case of Cholla, the terms "least expensive" and "most expensive" are used, but only in the context of providing a reference for visibility impacts, and not in the context of an evaluation of costs. This does not constitute "consideration," as it involves little more than ensuring the presence of cost values, with no judgment, analysis, or interpretation of their meaning.

Second, we disagree with the commenter's characterization of our disapproval as based on a "preference" for a different format or form of explanation for ADEQ's BART determinations. As discussed in the previous paragraph, ADEQ has not discussed its BART determination rationale, particularly with regard to costs of compliance, in *any* format. While ADEQ's RH SIP does include cost information, it provides no explanation regarding how, or even if, this cost information was used in arriving at its NO<sub>x</sub> BART determinations. Although we agree that the RHR does provide states significant discretion in their consideration of the BART factors, AUG's comment presupposes that these costs were considered. The Arizona Regional Haze SIP does not indicate that they were considered.

*Comment:* ADEQ noted that the same principles were used for the PM<sub>10</sub> and SO<sub>2</sub> BART evaluations as were used for the NO<sub>x</sub> BART evaluation, yet EPA accepted the approach for only PM<sub>10</sub> and SO<sub>2</sub>.

*Response:* We disagree that we accepted ADEQ's approach for PM<sub>10</sub> and SO<sub>2</sub>. Although we did not disapprove ADEQ's PM<sub>10</sub> and SO<sub>2</sub> BART determinations, the absence of a disapproval of these determinations should not be construed to represent acceptance of the approach by which they were developed. We acknowledge that ADEQ took a similar approach in its analyses for PM<sub>10</sub> and SO<sub>2</sub> as for NO<sub>x</sub>, and that these analyses exhibit the same deficiencies we have noted elsewhere for the NO<sub>x</sub> BART determinations. However, we did not disapprove the PM<sub>10</sub> and SO<sub>2</sub> determinations because we find that the shortcomings in these analyses did not result in unreasonable BART determinations and therefore were generally "harmless errors."

With regard to PM<sub>10</sub>, we note that ADEQ determined the most stringent control technology (fabric filters) was

BART for each of the Cholla units. For Apache and Coronado, ADEQ determined that the current control technology (hot-side ESPs) was BART and eliminated the most stringent control technology (fabric filters). We note that PM emissions from EGUs typically contribute only a small percentage of the modeled visibility impact from EGUs, and that controlling their emissions results in very small visibility benefit. For example, CALPUFF visibility modeling performed by WRAP indicates that for Apache, the maximum baseline PM<sub>10</sub> visibility impact at the most affected Class I area (Chiricahua NM) is 0.04 dv.<sup>17</sup> Assuming that a more stringent control technology could achieve 100 percent PM control and eliminate this entire visibility impact, a more stringent PM<sub>10</sub> BART determination would therefore achieve, at most, a visibility benefit of 0.04 dv. Although ADEQ did not document its analysis or weighing of the five factors in arriving at the PM<sub>10</sub> BART determinations for Apache or Coronado, additional analysis would not have the potential to result in selection of a more stringent control technology in light of the small potential for visibility benefit.

With regard to SO<sub>2</sub>, ADEQ selected the most stringent control technology (wet FGD) for all units at Apache, Cholla, and Coronado. Although ADEQ did not "take into account the most stringent emission control level that the technology is capable of achieving," correcting for this flaw would not have the potential to result in the selection of a more stringent control technology, since wet FGD, which is the most stringent control technology, was already selected as BART. Further discussion of our evaluation of ADEQ's BART analyses for PM<sub>10</sub> and SO<sub>2</sub> is provided below.

*Comment:* The commenters stated that one of EPA's reasons for rejecting ADEQ's cost determinations is because the costs are inconsistent with the CCM. The commenters noted that use of the outdated Manual is not required by the CAA or the BART rules and provide references in which EPA has stated that the Manual is only one tool that can be used but that other cost data should also be considered.

*Response:* We partially agree with this comment. We acknowledge that our BART guidelines state, "In order to maintain and improve consistency, cost estimates should be based on the [CCM], where possible" and that "[w]e believe that the [CCM] provides a good

<sup>16</sup> See, e.g., BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.E.2. ("You should provide a justification for adopting the technology that you select as the 'best' level of control, including an explanation of the CAA factors that led you to choose that option over other control levels.")

<sup>17</sup> See Docket Item No. B-12, "Summary of WRAP RMC BART Modeling for Arizona."

reference tool for cost calculations, but if there are elements or sources that are not addressed by the Control Cost Manual or there are additional cost methods that could be used, we believe that these could serve as useful supplemental information.”<sup>18</sup> The Manual contains two types of information: (1) Study level cost estimates of capital and operation and maintenance (O&M) costs for certain specific types of pollution control equipment, such as SCR, and (2) a broader costing methodology, known as the overnight method. We agree that the language of the BART Guidelines does not require strict adherence to the study level equations and cost methods used to estimate capital and O&M costs.

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.<sup>19</sup> 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<sup>20</sup> 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.

*Comment:* One commenter (SRP) stated that ADEQ appropriately considered the “dollars-per-deciview” cost-effectiveness of different control options, which is reasonable and entirely within the broad discretion afforded to the states under the CAA. SRP stated that because BART is a component of the CAA’s visibility program, it is more crucial to evaluate control costs in relation to the visibility improvements that may be expected using a dollars per deciview (\$/dv) metric.

*Response:* The BART Guidelines require that cost-effectiveness be calculated in terms of annualized dollars per ton of pollutant removed, or \$/ton, but also list the \$/deciview ratio as an additional cost-effectiveness measure that can be employed along with \$/ton for use in a BART evaluation.<sup>21</sup> However, the \$/dv metric is only useful to the extent that it reflects appropriately calculated costs and visibility benefits. As explained elsewhere in this document, we have determined that ADEQ did not evaluate costs and visibility benefits in a manner consistent with the RHR and the BART Guidelines. Therefore, while ADEQ certainly had the discretion to take \$/dv into consideration as part of its BART analyses, the values that it relied upon in doing so were not reasonable.

#### b. ADEQ’s Approach to Energy and Non-Air Quality Environmental Impacts

*Comment:* One commenter (SRP) stated that EPA inappropriately downplayed the energy and non-air quality factor in its review of ADEQ’s BART analysis. Another commenter (ADEQ) noted that because fly ash ammonia residues have the potential to contaminate ground and surface waters, ADEQ included potential environmental impacts and the economics of disposing the fly ash in its BART analysis.

*Response:* We do not agree that we inappropriately downplayed the energy and non-air quality environmental impacts factor in our review of ADEQ’s BART analyses. ADEQ provided only brief consideration of this factor in its BART analyses and did not explain how it weighed this factor against the other statutory factors. Because ADEQ’s analysis of this factor was limited in scope, our evaluation of this factor in reviewing the SIP was similarly limited. We discuss our analysis of this factor in our FIP action below.

#### c. ADEQ’s Approach to Degree of Visibility Improvement

*Comment:* Several commenters (American Coalition for Clean Coal Electricity (ACCCE), AEPCO, APS, AUG, Navajo Nation, PacifiCorp, SRP) asserted that EPA improperly dismissed ADEQ’s visibility impacts analyses. The commenters cited the BART Guidelines (70 FR 39170, July 6, 2005) to assert that there is no prescribed method for states to consider and weigh visibility impacts and, thus, EPA has no legal grounds for disapproving a SIP based on the method the State has chosen to consider visibility impacts or improvements. The commenters added that whatever EPA’s preference, it has no discretion to substitute its method or its conclusion for those of the State. According to the commenters, it is clear that the BART rules envision—or, at a minimum, allow—a visibility improvement analysis that is focused on visibility impacts in the most impacted area.

Regarding ADEQ’s BART determination at Coronado in particular, one commenter (SRP) noted that ADEQ evaluated a visibility index derived from an average of modeled visibility improvements at the nine Class I areas closest to Coronado. The commenter asserted that this approach was well within the State’s discretion to assess visibility under the BART rules. Another commenter (AUG) argued this consideration of an average visibility impacts index is an even more thorough type of evaluation than that required by the BART rules.

One commenter (AEPCO) added that EPA’s proposal to disapprove ADEQ’s NO<sub>x</sub> BART determinations was largely based on its concern with ADEQ’s reliance on the Western Regional Air Partnership (WRAP) modeling.

By contrast, another commenter asserted that since the facilities’ modeling results indicated that controls would contribute to visibility improvements in multiple Class I areas, ADEQ should consider these benefits rather than looking at the benefits in only a single Class I area. The commenter believes that overlooking significant visibility benefits in this way considerably understates the overall benefit of controls to improved visibility. The commenter contended that the procedure followed by ADEQ is not a sufficient basis for making BART determinations for sources with substantial benefits across many Class I areas.

*Response:* EPA’s proposed disapproval of ADEQ’s NO<sub>x</sub> BART determinations was not based on any concern with the WRAP modeling

<sup>18</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.4.a.

<sup>19</sup> See *Id.* section IV.D.4.f (“A reasonable range [of cost-effectiveness values] would be a range that is consistent with the range of cost-effectiveness values used in other similar permit decisions over a period of time.”)

<sup>20</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.4.

<sup>21</sup> BART Guidelines sections IV.D.4.c and IV.E.



protocol, upon which ADEQ relied for its BART analyses. On the contrary, we found that the modeling procedures relied upon by ADEQ were “in accord with EPA guidance.”<sup>22</sup> However, we noted that ADEQ’s use of the results of modeling in making BART decisions was “problematic in several respects.”<sup>23</sup> In other words, our concern with the visibility analysis was not with the technical adequacy of the modeling itself, but rather with how ADEQ interpreted the results of this modeling.

In its BART analyses for Apache and Cholla, ADEQ considered visibility improvements only at the single Class I area with the greatest modeled impact from a facility. This neglects improvements that would occur at other nearby Class I areas, and in general is not adequate for assessing the overall visibility benefit from candidate BART controls. As noted by commenters, the BART Guidelines provide that, “[i]f the highest modeled impacts are observed at the nearest Class I area, [a State] may choose not to analyze the other Class I areas any further and additional analyses might be unwarranted.”<sup>24</sup> Commenters argued that this language shows that Arizona’s exclusive focus on improvements at a single Class I area is allowed under the BART Guidelines. However, this language is not intended as an invitation for states to ignore significant visibility improvements at multiple Class I areas. Rather, it is intended to provide a way of streamlining a complex and difficult modeling exercise where “an analysis may add a significant resource burden to a State.”<sup>25</sup> For example, when the visibility benefits at the most impacted Class I area alone are sufficient to justify the selection of the most stringent control technology as BART, then analysis of additional areas would be unnecessary and the state could conserve resources by not modeling the impacts on those additional areas. Here, by contrast, ADEQ did not perform its own modeling at all, but instead relied on modeling performed by contractors for the facilities. This modeling indicated that the installation of more stringent controls (i.e., SNCR or SCR) would result in visibility benefits at multiple Class I areas, yet ADEQ chose to consider the benefits only at the most impacted area. Where, as here, the benefits of controls have been modeled for a number of surrounding areas and consideration of these benefits is useful

in determining the appropriate level of controls, EPA does not agree that these benefits may be ignored.<sup>26</sup>

While there may be no single prescribed method to consider and weigh visibility impacts, the BART Guidelines do require that certain visibility impacts be included in the considering and weighing. EPA disagrees that state flexibility extends to categorically excluding consideration of visibility improvements occurring at multiple Class I areas. Considering benefits at multiple areas does not necessarily require use of the “cumulative” improvement approach (i.e., the direct sum of improvements at all the areas), but does require that improvements at those areas be taken into account in some way. For example, one could simply list visibility improvements at the various areas, and qualitatively weigh the number of areas and the magnitudes of the improvements. However, ADEQ did not do this for any of the sources covered by this action.

With respect to ADEQ’s consideration of visibility improvements for Coronado, EPA agrees that average visibility index used by ADEQ could be acceptable in itself as part of assessing multiple area impacts and improvements; indeed it is a variant of the cumulative improvement approach. However, without any consideration of particular area improvements, the averaging process causes especially large benefits at some individual areas to be diluted or lost, effectively discounting some of the more important effects of the controls. In addition, the approach is counter to ADEQ’s emphasis elsewhere in the SIP on the importance of considering the visibility improvement at the single area having the largest impact from a given facility. Finally, ADEQ provided no discussion of how the results of the visibility index were weighed against the other BART factors.

In addition, ADEQ considered visibility improvements from controls on only a single emitting unit at a time, despite the fact that each of the three sources has multiple BART-eligible units. This neglects the full improvement that would result from controls on the facility, with the potential for dismissing emitting unit benefits that are individually small, but that collectively could have a significant visibility benefit. The RHR requires RH SIPs to include a “determination of

BART for each BART-eligible source in the State that emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area.”<sup>27</sup> The BART Guidelines explain that, “[i]f the emissions from the list of emissions units at a stationary source exceed a potential to emit of 250 tons per year for any visibility-impairing pollutant, then that collection of emissions units is a BART-eligible source.”<sup>28</sup> Therefore, it is that collection of units for which one must make a BART determination. The Guidelines state “you must conduct a visibility improvement determination for the source(s) as part of the BART determination. \* \* \*”<sup>29</sup> This requires consideration of the visibility improvement from BART applied to the facility as a whole.

The RHR and the Guidelines do not preclude consideration of visibility improvement from controls on individual units, but that would be in addition to considering the improvement from the whole facility. The BART Guidelines clearly allow for the consideration of technical feasibility and cost-effectiveness on a unit-by-unit basis where appropriate, but those considerations fall under different factors than the assessment of the degree of visibility improvement, and do not remove the obligation to consider visibility improvement from BART applied to the facility as a whole. In sum, while the State has some flexibility in choosing a specific procedure to consider these cumulative area and multiple unit benefits, when such benefits are significant, it is not reasonable to ignore them altogether as ADEQ did.

*Comment:* One commenter (NPS) agrees with EPA that the ammonia background concentration assumed by ADEQ for Cholla and Coronado may be too low, ranging from 1 part per billion (ppb) down to 0.2 ppb. According to the commenter, EPA guidance recommends the use of a 1 ppb ammonia background for areas in the west, absent compelling evidence to the contrary.

Other commenters (APS and AUG) state that the Interagency Workgroup on Air Quality Modeling (IWAQM) recommended value of 1ppb is outdated and should not be used now that better data have been gathered and since the CALPUFF model was updated to allow for monthly, rather than yearly, average ammonia concentrations. APS also noted that EPA Region 9 has explicitly

<sup>22</sup> 77 FR 42841.

<sup>23</sup> *Id.*

<sup>24</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.5.

<sup>25</sup> See 70 FR 39126.

<sup>26</sup> See, e.g., 76 FR 52388, 52430 (San Juan Generating Station); 77 FR 51620, 51631–51632 (Four Corners Power Plant); and 77 FR 51915, 51922–51923 (Roseton and Danskammer Generating Stations).

<sup>27</sup> 40 CFR 51.308(e)(1)(ii).

<sup>28</sup> 40 CFR Part 51, Appendix Y, section II.A.4.

<sup>29</sup> *Id.* section IV.D.5.

approved the use of the same monthly-varying background ammonia concentrations, which were based on actual field measurements, in running the CALPUFF model for two other sites located close to Cholla and that were used by ADEQ in its analysis. These values range from 1 ppb during the summertime to 0.2 ppb during cold winter months. EPA has also stated in response to comments on the Montana regional haze FIP (77 FR 57864, September 18, 2012) that “it is preferable to use ambient ammonia measurements when such data are available rather than using default background ammonia concentrations.” Another commenter (Navajo Nation) agrees that EPA should use actual, recorded data wherever possible, especially ammonia background values. AUG concludes that EPA has no basis for rejecting the use of refined background ammonia concentration values in disapproving the SIP.

*Response:* The IWAQM Guidance<sup>30</sup> is the only guidance available for choosing ammonia background concentrations. Because of the paucity of monitoring data and the uncertainty in other ammonia estimation methods, EPA concludes that it is appropriate to use the default 1 ppb from the IWAQM Guidance.

As stated by the commenter, EPA did originally accept monthly varying ammonia values of 0.2 to 1.0 ppb for BART analyses performed by AECOM for APS for the Four Corners Power Plant (FCPP), and by SRP for the Navajo Generating Station (NGS). However, shortly after that, the USDA Forest Service brought to EPA’s attention ammonia monitored in the Four Corners area showing concentrations up to 3 ppb, described in a journal paper<sup>31</sup> by Mark Sather and others. EPA and the Forest Service also estimated ammonia concentrations by “back calculating” the amount of ammonia needed to form the ammonium nitrate and ammonium sulfate collected at Arizona and New Mexico sites in the IMPROVE monitoring network. This yielded concentrations ranging from 0.4 to 1.3 ppb, with winter values considerably higher than the AECOM 0.2 ppb

<sup>30</sup> *Interagency Workgroup On Air Quality Modeling (IWAQM) Phase 2 Summary Report And Recommendations For Modeling Long Range Transport Impacts* (EPA-454/R-98-019), EPA OAQPS, December 1998, <http://www.epa.gov/scram001/7thconf/calpuff/phase2.pdf>.

<sup>31</sup> Mark E. Sather et al., “Baseline ambient gaseous ammonia concentrations in the Four Corners area and eastern Oklahoma, USA”. *Journal of Environmental Monitoring*, 2008, 10, 1319–1325, DOI: 10.1039/b807984f.

recommended by the commenter.<sup>32</sup> Since this method accounts only for ammonium, and not remaining free gaseous ammonia, the total ammonia originally available to form visibility-impairing compounds may actually be higher. Because of uncertainty in the “back-calculation” method, and criticism of it, EPA relied on it in the FCPP FIP only as corroboration for the IWAQM default of 1 ppb.<sup>33</sup> Nevertheless, it supports the idea that winter ammonia levels in the Class I areas affected by emissions from sources in Arizona are likely substantially higher than 0.2 ppb.

EPA agrees with commenters that it would be preferable to use actual monitoring data to determine background ammonia concentrations. However, much of the existing data cited by the commenters is from other states, and so is unlikely to be representative for evaluating visibility impacts at Arizona’s Class I areas. Further, the data comprises only ammonia itself, and not ammonium; or if it does include ammonium, that is not cited by the commenters. Visibility-impairing ammonium sulfate and ammonium nitrate are formed from ammonia, SO<sub>2</sub>, and NO<sub>x</sub>. Therefore the ammonium represents part of the pool of ammonia that could be available to interact with the SO<sub>2</sub> and NO<sub>x</sub> from a facility and contribute to visibility impacts, and should be accounted for in estimating ammonia background concentrations. In several of the research papers<sup>34</sup> cited by commenter

<sup>32</sup> See, e.g., Proposed Rule: Source Specific Federal Implementation Plan for Implementing Best Available Retrofit Technology for Four Corners Power Plant: Navajo Nation Technical Support Document, pages 59–61, 65–66, 68–73.

<sup>33</sup> *Id.* at page 68.

<sup>34</sup> *RoMANS—Rocky Mountain Atmospheric Nitrogen & Sulfur Study*, William C. Malm and Jeffrey L. Collett. National Park Service, CSU-CIRA, Fort Collins, CO. ISSN 0737-5352-84. October 2009. <http://www.nature.nps.gov/air/Studies/romans.cfm>. Table 3.9 on p.3–38 shows ammonium comparable to or about half of ammonia, depending on measurement method. It also shows that the spring time mean and maximum ammonium are about 0.22 and 0.57 µg/m<sup>3</sup>, respectively, or 0.38 and 0.78 ppb; and the mean and maximum ammonia are about 0.38 and 1.0 µg/m<sup>3</sup> or 0.51 and 1.4 ppb. The sum of these means and maxima is 0.81 and 2.2 ppb, respectively. Figure 4.26 on p.4–26 shows daily sums of ammonium and ammonia, with values of 2.5–5 µg/m<sup>3</sup> or 3.6–7.2 ppb occurring frequently. These are substantially higher than values cited by the commenters. “NH<sub>3</sub> Monitoring in the Upper Green River Basin, Wyoming”, by John V. Molenaar, H. James Newell, Jeffrey Collett, et al. Extended Abstract #70, A&WMA Specialty Conference “Aerosol & Atmospheric Optics: Visual Air Quality and Radiation”, Moab, Utah, 28 April—2 May 2008, p.3 Figure 1 and p.4 Figure 3 show ammonium comparable to ammonia in summer and far greater in winter. “Aerosol Ion Characteristics During the Big Bend Regional Aerosol and Visibility Observational Study,” Taehyoung Lee, Sonia M.

APS, the amount of measured ammonium is comparable to and at times much greater than the amount of ammonia.

New ammonia monitoring data were collected by SRP at several sites between NGS and the two nearest Class I areas, Capitol Reef National Park and Grand Canyon National Park, from December 2009 through April 2010. The monitoring report,<sup>35</sup> cited by commenter APS, describes a surprisingly high spatial variability in ammonia concentrations. The two monitors in the Cameron area south of NGS (and east-southeast of the Grand Canyon) showed consistent concentration differences despite being less than five miles from each other; this may be due to relatively localized ammonia sources. These sites also showed consistently lower measurements than the Halls Crossing site, north of NGS (and southwest of Capitol Reef). The range in concentrations was comparable to the range seen between the AECOM values at the low end, and EPA’s back-calculated values at the high end. Unfortunately, because of the variability and its unknown causes, the data collected did not lead to a clear picture of appropriate and representative ammonia background concentrations to use with CALPUFF.

In any case, as mentioned above, some nearby monitored data reported in Sather’s paper show considerably higher ammonia than recommended by some commenters, so it is not clear that values lower than 1 ppb should be used. 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 and supported by the FLMs.

*Comment:* Two commenters (APS and AUG) noted that the RHR and BART Guidelines are silent regarding whether visibility improvements should be modeled on a unit-by-unit basis or a plant-wide basis, and there is no legal requirement that units be modeled aggregately. Given that visibility benefits are approximately additive, the commenters contend that it is unreasonable for EPA to conclude that

Kreidenweis & Jeffrey L. Collett Jr. *Journal of the Air & Waste Management Assoc.* vol.54, issue 5, 2004, pages 585–592. DOI:10.1080/10473289.2004.10470927, Table 1 p. 587 shows ammonium about four times as high as ammonia.

<sup>35</sup> “Measurements of Ambient Background Ammonia on the Colorado Plateau and Visibility Modeling Implications”, Salt River Project, Dr. Ivar Tombach, Consultant, and Robert Paine, AECOM Environment, September 2010.

ADEQ's BART analyses failed to consider any significant visibility effect merely because ADEQ modeled the units separately. In addition, AUG notes that it is necessary to determine the effects of emissions from units individually so that projected visibility impacts can be considered in light of costs and other impacts associated with BART-candidate controls for that particular unit, and modeling units together could obscure these comparisons.

*Response:* Considering the visibility benefits of multiple units together does not preclude a state from also considering individual unit benefits, as well as individual unit costs. EPA does not agree that modeling the units together obscures these other comparisons. Rather, the benefit of controls for an entire BART-eligible source is a factor that should be considered along with those other comparisons. In any case, whether considered unit by unit or all units together, visibility improvement has no effect on the assessment of cost-effectiveness as measured by dollars per ton of reductions.

#### B. Comments on ADEQ's Individual BART Analyses and Determinations

##### 1. ADEQ's BART Analyses and Determinations for Apache Unit 1

*Comment:* One commenter (NPS) concurred with ADEQ's and EPA's proposals for BART at Apache Unit 1.

*Response:* We acknowledge NPS's concurrence.

##### 2. ADEQ's BART Analyses and Determinations for Apache Units 2 and 3

##### a. ADEQ's BART Analysis and Determination for NO<sub>x</sub>

*Comment:* One commenter (Earthjustice) commended EPA's decision to disapprove ADEQ's NO<sub>x</sub> BART determination for Apache Units 2 and 3. The commenter stated that EPA correctly concluded that ADEQ's BART determination for NO<sub>x</sub> inflated the costs of more-stringent NO<sub>x</sub> controls by including costs not allowed by EPA Cost Control Manual, provided little reasoning about the visibility benefits of additional NO<sub>x</sub> controls, and did not weigh the visibility impacts at all nearby Class I areas. The commenter asserted that because ADEQ's BART analysis does not comply with the RHR's requirements, EPA must disapprove ADEQ's BART determinations for Apache Units 2 and 3.

*Response:* We agree that ADEQ's BART analysis for Apache Units 2 and

3 does not comply with the RHR's requirements. As discussed further below, we performed a supplemental analysis using the version of AEPCO's cost estimate that adheres to our assumptions regarding costs that are allowed by the CCM (i.e., capital costs for the installation of SCR with LNB and OFA of \$164.9 million), and we also considered the fact that AEPCO is a small entity under the Regulatory Flexibility Act.<sup>36</sup>

##### b. ADEQ's BART Analysis and Determination for PM<sub>10</sub>

*Comment:* One commenter (NPS) agreed with ADEQ and EPA that BART for PM<sub>10</sub> at Apache Units 2 and 3 is upgrades to the existing electrostatic precipitators (ESPs) and a PM<sub>10</sub> emissions limit of 0.03 lb/MMBtu. The commenter noted that ADEQ stated that PM<sub>10</sub> emissions would be measured by conducting EPA Method 201/202 tests.

In contrast, a second commenter (Earthjustice) disagreed with EPA's proposal to approve ADEQ's PM<sub>10</sub> BART determination for Apache Units 2 and 3. The commenter contended that EPA proposed to approve the BART determination despite acknowledging that ADEQ did not conduct a full BART analysis for PM<sub>10</sub> because it overestimated costs and failed to consider upgrades to the existing ESPs. However, the commenter believes that lower emission rates are achievable and, as a result, that EPA should disapprove ADEQ's BART determination, conduct a full five-factor BART analysis and set a lower emission limit as BART for PM<sub>10</sub>. According to the commenter, the Sahu report demonstrates that nearly 150 EGUs across the nation with a variety of PM controls achieve emission rates lower than 0.03 lb/MMBtu. The commenter asserted that neither ADEQ nor EPA provided any explanation why Apache Units 2 and 3 could not similarly meet a lower emission limit.

*Response:* As we noted in our proposal, ADEQ's BART analysis did not demonstrate that all potential upgrades to the existing ESPs at Apache Units 2 and 3 were fully evaluated or that the costs were calculated in compliance with the Control Cost Manual. However, we concluded that this was a harmless error because of the relatively small visibility improvement associated with PM<sub>10</sub> reductions from

<sup>36</sup> As explained in our proposal, a firm primarily engaged in the generation, transmission, and/or distribution of electric energy for sale is small if, including affiliates, the total electric output for the preceding fiscal year did not exceed 4 million megawatt hours. 77 FR 42867. AEPCO sold under 3 million megawatt hours in 2011 and is therefore a small entity.

these units.<sup>37</sup> Therefore, we proposed to approve ADEQ's determination that BART for PM<sub>10</sub> at Apache Units 2 and 3 is upgrades to the existing ESPs and a PM<sub>10</sub> emissions limit of 0.03 lb/MMBtu.

One commenter asserted that this limit is too lenient, since other coal-fired units are achieving lower limits, based on test data submitted by various utilities to EPA as part of an Information Collection Request (ICR) for the Mercury and Air Toxics (MATS) Rule.<sup>38</sup> EPA disagrees with this comment. The MATS Rule establishes an emission standard of 0.030 lb/MMBtu filterable PM (as a surrogate for toxic non-mercury metals) as representing Maximum Achievable Control Technology (MACT) for coal-fired EGUs.<sup>39</sup> This standard derives from the average emission limitation achieved by the best performing 12 percent of existing coal-fired EGUs (taking into account the variability in the testing results for these facilities), based upon to the same test data referred to by the commenter.<sup>40</sup> The BART Guidelines provide that, "unless there are new technologies subsequent to the 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."<sup>41</sup> Therefore, we are approving ADEQ's determination that a PM<sub>10</sub> limit of 0.03 lb/MMBtu represents BART for these units.

##### c. ADEQ's BART Analysis and Determination for SO<sub>2</sub>

*Comment:* One commenter (Earthjustice) disagreed with EPA's proposal to approve ADEQ's SO<sub>2</sub> BART determination at Apache Units 2 and 3. The commenter states the approval is contrary to the RHR because ADEQ's BART determination is not supported by a valid five-factor analysis. The commenter states that EPA cannot speculate that it would reach the same conclusion as ADEQ, and it must undertake an independent full five-

<sup>37</sup> 77 FR 42847.

<sup>38</sup> Information Collection Request For National Emission Standards For Hazardous Air Pollutants (NESHAP) for Coal- And Oil-Fired Electric Utility Steam Generating Units (OMB Control No. 2060-0631). See <http://www.epa.gov/ttn/atw/utility/utilitypg.html> for detailed information obtained through this ICR.

<sup>39</sup> 77 FR 9304, 9450, 9458 (February 16, 2012) (codified at 40 CFR 60.42Da(a), 60.50Da(b)(1)).

<sup>40</sup> See Memorandum from Jeffrey Cole (RTI International) to Bill Maxwell (EPA) regarding "National Emission Standards for Hazardous Air Pollutants (NESHAP) Maximum Achievable Control Technology (MACT) Floor Analysis for Coal- and Oil-fired Electric Utility Steam Generating Units for Final Rule" (Dec. 16, 2011).

<sup>41</sup> 40 CFR Part 51, Appendix Y, Section IV.C.

factor BART analysis. The commenter argues that an SO<sub>2</sub> limit of 0.04 lb/MMBtu is achievable and cost-effective for Apache Units 2 and 3 according to the Sahu report. The commenter further asserts that, based on this report, scrubber upgrades can achieve SO<sub>2</sub> removal efficiencies of 98 percent and should have been investigated.

Another commenter (NPS) noted that that AEPSCO's BART reports indicate that uncontrolled SO<sub>2</sub> emissions are 0.69 lb/MMBtu, and that the ADEQ BART proposal would reduce SO<sub>2</sub> emissions by 78 percent down to 0.15 lb/MMBtu. Based on the SO<sub>2</sub> control data submitted by the commenter, the commenter asserted that other BART upgrades are achieving higher removal efficiencies and/or lower SO<sub>2</sub> limits. The commenter believes that the existing scrubbers can be upgraded to achieve better removal efficiency and lower emission rates than the 78 percent and 0.15 lb/MMBtu proposed by EPA. The commenter cited various examples of upgraded scrubbers achieving limits of less than 0.15 lb/MMBtu or removal rates of greater than 90 percent.

By contrast, ADEQ and AEPSCO expressed opposition to both a lower limit and a removal efficiency requirement. ADEQ asserted that "the limits included in the state SIP submittal are acceptable as BART" and "imposing dual-limitations will be unnecessary and burdensome for the facility." AEPSCO commented that ADEQ permit conditions, which require SO<sub>2</sub> absorption systems to be operated and maintained at all times in a manner consistent with good air pollution control practices for minimizing emissions, is sufficient, and an additional control efficiency limit is not necessary. An efficiency limit would also require modification to the monitors to include the capability to measure scrubber inlet SO<sub>2</sub> in addition to stack emissions, which would require additional capital and O&M expenditures.

*Response:* We proposed to approve ADEQ's determination that BART for SO<sub>2</sub> at Apache Units 2 and 3 is upgrades to the existing scrubbers with an associated emission limit of 0.15 lb/MMBtu (30-day rolling average). However, we also solicited comment on whether an efficiency requirement should be part of the BART requirement, since Apache has the ability to use coal from various sources that have varying sulfur content. After reviewing the comments received on our proposal, we have concluded that the emission limit set by ADEQ appropriately reflects BART for SO<sub>2</sub> at these units and that a removal efficiency

requirement would not be appropriate for these units.

While new wet scrubbers are capable of achieving 95 percent or better removal of SO<sub>2</sub>,<sup>42</sup> the Apache scrubbers were manufactured in the 1970s and designed to meet a limit of 0.8 lb/MMBtu (i.e., a control efficiency of up to 70 percent).<sup>43</sup> For such existing scrubbers achieving greater than 50 percent control, the BART Guidelines (which are not mandatory for these units) do not provide a presumptive limit or removal efficiency, but recommend consideration of cost-effective scrubber upgrades designed to improve the system's overall SO<sub>2</sub> removal efficiency.<sup>44</sup> In August 2009, AEPSCO provided information to ADEQ concerning potential scrubber upgrades at Apache Units 2 and 3.<sup>45</sup> AEPSCO noted that it was in the process of upgrading its limestone grinding system and described other potential upgrades, such as improving operation of the scrubber bypass damper system, upgrading the mist eliminator wash system, adding another sieve tray, and modifying the flue gas inlet. The enclosed "Wet FGD Implementation Plan" indicated that AEPSCO intended to proceed with upgrading the limestone grinding system, improving operation of the scrubber bypass damper system, and upgrading the mist eliminator wash system, but that "[t]he remaining wet FGD options were not selected on the basis of low probability of successfully making a significant difference in scrubber performance and/or high cost."<sup>46</sup>

Based on this information, we conclude that no further cost-effective scrubber upgrades are likely to be feasible for this facility and we are therefore deferring to ADEQ's determination that 0.15 lb/MMBtu represents BART for these units. Given the age of these scrubbers, we find that an additional removal efficiency requirement would be unnecessarily burdensome. This approach is consistent with our consideration of AEPSCO's status as a small entity in our FIP determination. We note that our final FIP includes a requirement to maintain and operate air pollution control equipment at all units in "a manner consistent with good air

pollution control practices for minimizing emissions" at all times. We expect that this requirement will help to ensure that the scrubbers on Apache Units 2 and 3 are properly maintained and operated under all conditions.

### 3. ADEQ's BART Analyses and Determinations for Cholla Units 2, 3 and 4

*Comment:* One commenter (APS) remarked that EPA stated that APS's contractor did not provide supporting information for its capital cost estimate, such as detailed equipment lists. The commenter argues that detailed equipment lists are typically not necessary for the level of accuracy needed for the process selection phase of a project and noted that its contractor used vendor quotes for the major pieces of equipment and factors for construction, balance of plant, electrical, owner's costs, surcharges, AFUDC and contingency.

*Response:* We do not agree with this comment. The BART Guidelines provide that:

You should include documentation for any additional information you used for the cost calculations, including any information supplied by vendors that affects your assumptions regarding purchased equipment costs, equipment life, replacement of major components, and any other element of the calculation that differs from the [CCM].<sup>47</sup>

Thus, detailed cost documentation is necessary to the extent that cost assumptions differ from the CCM. In this case, several of ADEQ's and APS's cost assumptions for control costs at Cholla differed from the CCM, but no such documentation was provided as part of the Arizona Regional Haze SIP.

#### a. BART Analysis and Determination for NO<sub>x</sub>

*Comment:* One commenter (Earthjustice) commended EPA's decision to disapprove ADEQ's NO<sub>x</sub> BART determination for Cholla Units 2, 3 and 4. The commenter stated that EPA correctly concluded that ADEQ's BART determination for NO<sub>x</sub> inflated the costs of more-stringent NO<sub>x</sub> controls by including costs not allowed by the Manual, and substantially underestimated the visibility benefits of additional NO<sub>x</sub> controls. The commenter asserted that because ADEQ's BART analysis does not comply with the RHR's requirements, EPA must disapprove ADEQ's BART determinations for Cholla Units 2, 3 and 4.

<sup>42</sup> See BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.E.4.

<sup>43</sup> See Apache Title V Permit Technical Support Document (2007), Table 9; Title V Permit (2007), Attachment B, section II.E.1.a.

<sup>44</sup> See BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.E.4.

<sup>45</sup> Letter from Michelle Freeark, AEPSCO, to Trevor Baggio, ADEQ (July 8, 2009).

<sup>46</sup> *Id.*

<sup>47</sup> 40 CFR Part 51, Appendix Y, section IV.4.a., note 15.

*Response:* As explained in our proposal and elsewhere in this document, we agree that ADEQ's BART analyses and determinations for NO<sub>x</sub> at Cholla Units 2, 3 and 4 do not comply with the requirements of the CAA and RHR. We are therefore disapproving these determinations.

b. BART Analysis and Determination for PM<sub>10</sub>

*Comment:* One commenter (NPS) agreed with EPA's proposal to approve ADEQ's BART determination for Cholla Units 2, 3 and 4 of an emission limit of 0.015 lb/MMBtu for PM<sub>10</sub> based on the use of fabric filters, the most stringent control technology available. In contrast, a second commenter (Earthjustice) disagreed with EPA's proposal to approve ADEQ's PM BART determination for Cholla Units 2, 3 and 4. The commenter contended that EPA proposed to approve the BART determination despite acknowledging that ADEQ did not conduct a full BART analysis for PM because fabric filters are the most stringent PM control technology available and ADEQ's 0.015 lb/MMBtu emission limit is "consistent" with other EGUs employing fabric filters (citing 77 FR 42849). However, the commenter believes that lower emission rates are achievable with fabric filters and, as a result, that EPA should disapprove ADEQ's BART determination, conduct a full five-factor BART analysis and set a lower emission limit as BART for PM<sub>10</sub>. According to the commenter, the BART Guidelines' exemption from a full five-factor analysis for the most stringent control technology is not applicable in this case because improvements to the fabric filters are possible and a lower emission rate is thus achievable.

The latter commenter (Earthjustice) stated that had EPA conducted the PM<sub>10</sub> BART analysis required by the RHR, it would show that an emission rate lower than 0.015 lb/MMBtu is BART for Cholla. According to the commenter, an expert report accompanying the commenter's submission (the "Sahu report") demonstrates that upgrades to the fabric filters can achieve a lower emission limit and, moreover, that nearly 100 EGUs across the nation with a variety of PM controls achieve emission rates lower than 0.015 lb/MMBtu. The commenter asserted that neither ADEQ nor EPA provided any explanation why Cholla Units 2, 3 and 4 could not similarly meet a lower emission limit.

*Response:* We are finalizing our approval of ADEQ's PM<sub>10</sub> BART determination at Cholla Units 2, 3 and 4. We find that an emission limit of

0.015 lb/MMBtu represents what can be continuously achieved with a properly operated baghouse on these units. The fabric filters (i.e., baghouses) at Cholla will all be new since they are scheduled to be installed between 2008 and 2016. Recent PSD BACT limits for coal-fired EGUs with new baghouses have typically ranged from 0.01 to 0.015 lb/MMBtu using Method 5.

As to the commenter's position that bag material selection would influence the level of PM that could be achieved, EPA notes that there are a number of factors that influence a utility's selection of proper bag material such as bag life, compatibility with exhaust gas stream and control of other pollutants such as mercury (Hg) or sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>). In addition, it should be noted that the latest revision to the EGU NSPS requires modified units to meet a PM limit of 0.015 lb/MMBtu.<sup>48</sup> Also, as noted above, the recent 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 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."<sup>49</sup> Therefore, we are finalizing our proposed approval of ADEQ's BART determination for PM<sub>10</sub> at Cholla Units 2, 3 and 4.

c. ADEQ's BART Analysis and Determination for SO<sub>2</sub>

*Comment:* Citing various examples of lower SO<sub>2</sub> limits at other coal-fired units, one commenter argued that the existing scrubbers at Cholla can be upgraded to achieve lower emission rates than the 0.15 lb/MMBtu proposed by EPA. Based on the SO<sub>2</sub> control data submitted by the commenter, the commenter asserted that other BART upgrades are achieving higher removal efficiencies and/or lower SO<sub>2</sub> limits.

Another commenter (Earthjustice) disagreed with EPA's proposal to approve ADEQ's SO<sub>2</sub> BART determination for Cholla Units 2, 3 and 4. The commenter states the approval is contrary to the RHR because ADEQ's BART determination is not supported by a valid five-factor analysis, which the commenter believes had flaws in its cost and visibility improvement analyses. The commenter alleged that EPA proposed to approve the SO<sub>2</sub> BART determinations based on unsupported speculation that the outcome would be the same if EPA performed the BART

analysis required by the RHR, although EPA identified nothing in the docket to support its claim that a full BART analysis would have yielded the same result. The commenter states that EPA cannot speculate that it would reach the same conclusion as ADEQ, and it must undertake an independent full five-factor BART analysis.

The commenter further stated that ADEQ's SO<sub>2</sub> BART analysis for Cholla Units 2, 3 and 4 is also flawed because ADEQ failed to analyze controls and upgrades that would result in emission rates lower than the BART Guidelines' presumptive BART limits. According to the commenter, EPA has recognized multiple times that the presumptive BART limits are merely the starting point for the BART determination, not the ending point. Moreover, the commenter asserted that the presumptive limits are often outdated with the result that appropriate consideration of the five statutory BART factors can result in far lower emission rates than presumptive BART. The commenter cited statements by EPA Region 6 (76 FR 64186, 64203, October 17, 2011, regarding proposed actions on Arkansas' RH SIP) and EPA Region 9 (77 FR 51633 regarding the final RH FIP for the Four Corners Power Plant).

Earthjustice also presented documentation that the commenter believes to show that lower SO<sub>2</sub> emission limits are achievable and cost-effective at Cholla Units 2, 3 and 4. According to the commenter, a report submitted with the comments (the "Stamper report")<sup>50</sup> shows that a proper BART determination for Cholla would have found that 98 percent SO<sub>2</sub> control efficiency achieving a 0.04 lb/MMBtu emission limit is BART for the units, and that even with the less-stringent 95 percent SO<sub>2</sub> control efficiency that is the basis of ADEQ's BART determinations, ADEQ should have required an SO<sub>2</sub> emission limit of 0.10 lb/MMBtu because 0.15 lb/MMBtu limit does not reflect 95 percent SO<sub>2</sub> removal.

Another commenter (APS) noted that the SO<sub>2</sub> content of the coal source for the Cholla plant is up to 3.0 lbs/MMBtu, and the maximum rate of removal that will be continuously achievable after the plant upgrades its scrubbers is 95 percent. Therefore, the commenter asserts that 0.15 lb/MMBtu is the

<sup>48</sup> 77 FR 9450 (February 16, 2012) (codified at 40 CFR 60.42Da).

<sup>49</sup> 40 CFR Part 51, Appendix Y, Section IV.C.

<sup>50</sup> Attachment 1 to Earthjustice Comments, Technical Support Document to Comments of Conservation Organizations, Proposed Arizona Regional Haze Partial SIP Approval and Partial FIP SO<sub>2</sub> and NO<sub>x</sub> BART Determinations for Cholla Units 2, 3 and 4 (September 17, 2012), prepared by Victoria Stamper.

maximum achievable SO<sub>2</sub> emissions limit.

*Response:* A number of commenters indicated that lower emission levels are being achieved at other sources with wet FGDs and western coal. However, none of these examples are based on coal with as high a potential SO<sub>2</sub> level as the coal that is currently burned at Cholla. APS historically burned coal from the McKinley mine located on the Navajo Reservation at the Cholla units. Following the closure of this mine, APS obtained coal from various sources until the company signed a long-term contract for coal from the El Segundo and Lee Ranch mines in New Mexico.<sup>51</sup> The sulfur content of coal from these two mines is substantially higher than Powder River Basin (PRB) coal and also much higher than coal from the former source, the McKinley mine.<sup>52</sup> The current coal contract for these units indicates that the typical sulfur content of this coal is equivalent to 2.4 lb/MMBtu SO<sub>2</sub> and can be as high as 3.0 lb/MMBtu.<sup>53</sup> Given that the transition to this coal has already occurred and that company has entered into a contract to continue purchasing this coal until 2024, we consider emissions based on this coal supply to “represent a realistic depiction of anticipated annual emissions for the source.”<sup>54</sup> The RHR and the BART Guidelines do not require states to restrict or alter a facility’s selection of the coal supply in order to meet a specific limit.

APS’s comments on the proposal indicate that the company intends to upgrade the existing SO<sub>2</sub> controls at Unit 2 to a new wet flue gas desulfurization (FGD) system, identical to those already installed on Units 3 and 4.<sup>55</sup> APS further explained that:

The coal source for [Cholla] is El Segundo and Lee Ranch coal with an SO<sub>2</sub> content of up to 3.0 lbs/mmBtu. The maximum rate of removal that will be continuously achievable after the scrubber upgrades \* \* \* are performed is 95 percent. If compliance is determined on a 30-day rolling average basis, the maximum SO<sub>2</sub> emission limit achievable at Cholla on a continuous basis is, therefore, 0.15 lb/mmBtu.<sup>56</sup>

Given this information, EPA finds that the ADEQ BART limit of 0.15 lb/MMBtu represents BART for SO<sub>2</sub> at these units.

<sup>51</sup> See “Additional APS Cholla BART response”, Appendix B.

<sup>52</sup> See, e.g., “APS Cholla Unit 2 BART report”, Table 2–2.

<sup>53</sup> See “Additional APS Cholla BART response”, Appendix B, Section 6.2.

<sup>54</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.4.d.

<sup>55</sup> “Comments of Arizona Public Service Company”, page 27.

<sup>56</sup> *Id.*, page 63.

As noted by APS, this limit would require a removal efficiency of 95 percent when these units are burning this “worst-case” (highest-sulfur) coal (i.e., 3.0 lb/MMBtu). Therefore, we are finalizing our approval of ADEQ’s BART limit of 0.15 lb/MMBtu of SO<sub>2</sub> for these units.

However, we remain concerned that this worst case coal is not representative of the typical coal that APS will receive from the El Segundo and Lee Ranch mines. APS’s current contract for this coal indicates that the minimum sulfur content is equivalent to 1.88 lb/MMBtu of SO<sub>2</sub> for the El Segundo coal and 1.64 lb/MMBtu of SO<sub>2</sub> for the Lee Ranch Coal.<sup>57</sup> When burning this lower-sulfur coal, the units would only need to achieve 90 to 92 percent control in order to meet the BART limit of 0.15 lb/MMBtu of SO<sub>2</sub>. While APS has stated that the scrubbers on Cholla Units 2, 3 and 4 will be able to continuously achieve a removal efficiency of 95 percent, the Arizona Regional Haze SIP does not include a requirement or procedures to ensure that the scrubbers are operated and maintained to achieve this level of control. Therefore, in order to ensure that these scrubbers are properly operated and maintained, consistent with 40 CFR 51.308(e)(1)(v), we are finalizing a removal efficiency requirement for SO<sub>2</sub> of 95 percent on a 30-day rolling basis for Cholla Units 2, 3 and 4. This requirement is explained further under “Comments on Enforceability Requirements in EPA’s BART FIP.”

#### 4. ADEQ’s BART Analyses and Determinations for Coronado Units 1 and 2

##### a. ADEQ’s BART Analysis and Determination for NO<sub>x</sub>

*Comment:* One commenter (NPS) agreed with EPA that ADEQ’s BART selection of LNB with OFA for Coronado is not adequately supported for the following reasons:

- ADEQ did not consider the typical visibility metrics of benefit at the area with maximum impact, nor benefits summed over the areas.
- Using the default 1 ppb ammonia background concentration would have increased estimated impacts and control benefits.
- There is no weighing of the visibility benefits and visibility cost-effectiveness for the various candidate controls and the various Class I areas.
- ADEQ does not indicate whether it considered any cost thresholds to be reasonable or expensive in analyzing the

<sup>57</sup> See “Additional APS Cholla BART response”, Appendix B, Section 6.2.

costs of compliance for the various control options.

Similarly, another commenter (Earthjustice) supported EPA’s disapproval of ADEQ’s NO<sub>x</sub> BART determination for Coronado Units 1 and 2. For the reasons discussed by the commenter above for Cholla Units 2, 3 and 4, the commenter agreed with what the commenter said was EPA’s conclusion that all of ADEQ’s BART determinations are fatally flawed in numerous respects (e.g., inflated costs and underestimated visibility benefits). Specific to Coronado, the commenter agreed that ADEQ failed to provide detailed and verifiable cost information and to properly consider the costs of compliance for each control option in its BART analysis (citing 77 FR 42851). In addition, the commenter indicated that ADEQ failed to properly evaluate the visibility benefits of more-stringent NO<sub>x</sub> controls at Coronado, used a novel and unapproved metric to measure visibility benefits, failed to consider cumulative visibility benefits across all affected Class I areas, and used incorrect background ammonia concentrations in its modeling. The commenter added that ADEQ also failed to explain how it evaluated the five statutory BART factors and selected BART based on the factors. The commenter asserted that because ADEQ’s BART analysis does not comply with the RHR’s requirements, EPA properly disapproved ADEQ’s NO<sub>x</sub> BART determinations for Coronado.

*Response:* We agree that ADEQ’s BART analysis for NO<sub>x</sub> at Coronado Units 1 and 2 did not comply with the requirements of the CAA and RHR.

*Comment:* One commenter (SRP) stated that EPA must accept ADEQ’s BART determination for NO<sub>x</sub> because it was a complete and thorough five-factor analysis conducted in accordance with the BART Guidelines and resulted in a reasonable and appropriate determination of NO<sub>x</sub> BART for Coronado.

*Response:* We do not agree with this comment. As explained in the NPRM and elsewhere in this document, ADEQ’s BART determinations for NO<sub>x</sub> did not comply with the requirements of the RHR or the BART Guidelines. Therefore, we are finalizing our disapproval of these NO<sub>x</sub> BART determinations, including the determinations at Coronado Units 1 and 2.

##### b. ADEQ’s BART Analysis and Determination for PM<sub>10</sub>

*Comment:* One commenter (NPS) agreed with EPA’s proposal to approve ADEQ’s PM<sub>10</sub> BART determination for

Coronado Units 1 and 2, noting that that emissions of PM<sub>10</sub> from Coronado Units 1 and 2 are currently controlled by hot-side ESPs and that, in terms of the consent decree, SRP is required to optimize its ESPs to achieve a PM<sub>10</sub> emission rate of 0.030 lb/MMBtu.

Another commenter (SRP) stated that EPA's approval of the Arizona BART determination for PM<sub>10</sub> is reasonable and appropriate, believing it to be consistent with the CAA and supported by the technical record in this rulemaking. The commenter does not believe any upgrades to the ESPs are warranted as part of the BART determination, as SRP has in place a plan to optimize performance of the existing equipment. The commenter noted that as part of the consent decree between SRP and EPA for Coronado, SRP is required to operate the ESPs "at all times when the Unit it serves is in operation to maximize PM emission reductions, provided that such operation of the ESP is consistent with the technological limitations, manufacturers' specifications, and good engineering and maintenance practices for the ESP," and this requirement also is reflected in Coronado's current Title V operating permit.

The commenter also noted that the PM<sub>10</sub> limit in the recently promulgated MATS Rule will be more stringent than the PM<sub>10</sub> limit proposed as BART. The commenter indicated that it makes sense for BACT to be more stringent than BART, and it likewise is appropriate for the MATS requirements to impose more stringent compliance obligations on utilities than a BART determination since MATS is intended to protect the public health from hazardous air pollutants, while BART is aimed at aesthetic concerns that Congress intended the states to address very gradually.

In contrast, a third commenter (Earthjustice) disagreed with EPA's proposal to approve ADEQ's PM<sub>10</sub> BART determination for Coronado Units 1 and 2. The commenter contended that EPA proposed to approve the BART determination despite acknowledging that ADEQ did not conduct a full BART analysis for PM<sub>10</sub> because EGUs with ESPs elsewhere have BART limits of 0.03 lb/MMBtu. However, the commenter believes that lower emission rates are achievable and, as a result, that EPA should disapprove ADEQ's BART determination, conduct a full five-factor BART analysis and set a lower emission limit as BART for PM<sub>10</sub>. According to the commenter, the Sahu report demonstrates that nearly 150 EGUs across the nation with a variety of PM controls achieve emission rates lower

than 0.03 lb/MMBtu. The commenter asserted that neither ADEQ nor EPA provided any explanation why Coronado Units 1 and 2 could not similarly meet a lower emission limit.

*Response:* EPA acknowledges that ADEQ did not perform a rigorous five-factor BART analysis for PM<sub>10</sub> at Coronado. However, a full five-factor analysis would be very unlikely to result in a change of control technology for PM<sub>10</sub>. Modeling of visibility impacts from direct PM<sub>10</sub> emissions has shown very small impairment for EGU PM<sub>10</sub> emissions in comparison to visibility impairment resulting from SO<sub>2</sub> and NO<sub>x</sub> emissions. The existing hot-side ESPs at Coronado Units 1 and 2 control PM<sub>10</sub> by greater than 98 percent. In addition, SRP is required under a Consent Decree to optimize the performance of these ESPs and to meet a PM limit of 0.030 lb/MMBtu as measured by Method 5.<sup>58</sup> The consent decree also requires Coronado to install and conduct performance specification testing of a particulate matter CEMS (PMCEMS).

Installing the best control, a baghouse, would result in a cost exceeding \$100,000/ton of additional PM removed. From a cost and visibility improvement standpoint, it is not justifiable to require replacement of controls that can achieve a reasonably low emission level on a continuous basis. As noted previously, 0.030 lb/MMBtu is the limit for filterable PM in the recently issued EGU MATS rule. Therefore, we are finalizing our approval of ADEQ's BART determination for PM<sub>10</sub> at these units.

#### c. ADEQ's BART Analysis and Determination for SO<sub>2</sub>

*Comment:* One commenter (NPS) noted that the consent decree between EPA and SRP requires installation of wet flue gas desulfurization (WFGD) systems on both Coronado units to achieve a 30-day rolling average SO<sub>2</sub> removal efficiency of at least 95 percent or a 30-day rolling average SO<sub>2</sub> emissions rate of no greater than 0.080 lb/MMBtu. The commenter added that EPA proposed to approve ADEQ's BART SO<sub>2</sub> emission limit of 0.08 lb/MMBtu (30-day rolling average) for Coronado Units 1 and 2, which the commenter indicated would be consistent with the more stringent limits on WFGD upgrades that the commenter has seen.

One commenter (SRP) stated that EPA's approval of ADEQ's BART determination for SO<sub>2</sub> is reasonable and appropriate, believing it to be supported by the technical record. In response to

EPA's request for comment on whether a lower emission limit may be achievable when the units are burning a lower-sulfur coal, the commenter responded that it is inappropriate for EPA to establish a BART limit that would be premised on any restriction of SRP's fuel supply. According to the commenter, this type of restriction would increase unit operating costs and reduce operational flexibility, and EPA provides no technical record to support consideration of this emissions reduction option.

Another commenter (Earthjustice) disagreed with EPA's proposal to approve ADEQ's SO<sub>2</sub> BART determination. The commenter states the approval is contrary to the RHR because ADEQ's BART analyses are not supported by a valid five-factor analysis. The commenter states that EPA cannot speculate that it would reach the same conclusion as ADEQ, and it must undertake an independent full five-factor BART analysis, which the commenter believes would result in a SO<sub>2</sub> BART limit of 0.04 lb/MMBtu based on a 30-day rolling average. Earthjustice further asserted that, according to the Sahu report, WFGD can achieve SO<sub>2</sub> removal efficiencies of 98 percent and the use of low-sulfur coals, which can further reduce SO<sub>2</sub> emissions, also should have been investigated.

*Response:* EPA does not agree that we should disapprove the ADEQ BART determination and set an emission limit as low as 0.04 lb/MMBtu for SO<sub>2</sub>. EPA does acknowledge that while burning some coals, such as from PRB, these limits can be achieved at new units (though only achieved continuously over longer than 30-day averages), but EPA does not find that this limit would be consistently achievable at Coronado. Coronado receives its coal supply by rail line and has access to various sources of coal including PRB, Colorado and New Mexico coals. As mentioned previously, the RHR and the BART Guidelines do not require emission limits to be set at a level that would restrict the flexibility of EGUs to use available coals with varying sulfur content.

The consent decree between EPA and SRP described in our proposal requires installation of wet flue gas desulfurization (WFGD) systems (i.e., new scrubbers) at both units at Coronado by January 1, 2013. These scrubbers are required to achieve either 0.080 lb/MMBtu of SO<sub>2</sub> or 95 percent reduction of SO<sub>2</sub> across the FGD, both

<sup>58</sup> Consent Decree in *United States v. Salt River Project*, CV 08–1479–PHX–JAT (entered Dec. 19, 2008).

over a rolling 30-day basis.<sup>59</sup> ADEQ has selected 0.08 lb/MMBtu as the BART emission limit for these units. We find that this is an appropriate limit for these units and are finalizing our approval of this determination.

We also note that the recently promulgated EGU MATS rule, which uses an SO<sub>2</sub> limit as an acceptable surrogate for limiting the emissions of hazardous acid gases, has set the limit at 0.20 lb/MMBtu of SO<sub>2</sub> for existing EGUs like Coronado Units 1 and 2.<sup>60</sup>

## C. General Comments on EPA's BART FIP Analyses and Determinations

### 1. Selection of Baseline Period

*Comment:* Several commenters expressed disagreement with our general approach to the selection of baseline periods. One commenter (NPS) stated a general preference for the use of a baseline period that represents pre-control emissions, as advised in the BART Guidelines, to estimate baseline emissions for the purpose of calculating the average cost-effectiveness of the complete control system (e.g., combustion controls plus SCR). The commenter believes that this avoids any biasing of the calculations by sources that install combustion controls during the BART evaluation process. NPCA asserted that the "proper" baseline for BART determinations is 2001–2004. ADEQ asserted EPA violated the RHR provision in 51.308(d)(2)(i), which specifies the period for establishing baseline visibility conditions as 2000–2004, by using the period between 2008 and 2011 as a baseline period for EPA's BART analyses.

*Response:* We disagree that our use of updated baseline periods for BART determinations is inappropriate or inconsistent with the CAA or the RHR. While the RHR specifies 2000–2004 as the baseline for purposes of measuring reasonable progress at Class I areas during the first implementation period,<sup>61</sup> neither the RHR nor the BART Guidelines require that this particular timeframe be used as the baseline for BART determinations at individual sources. Rather, the Guidelines provide that, for purposes of calculating the costs of compliance:

The baseline emissions rate 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.<sup>62</sup>

This provision is consistent with the statutory requirement that each BART determination take into consideration "any existing pollution control technology in use at the source."<sup>63</sup> While the Guidelines do not specify particular dates for this "baseline period" for BART analyses, 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, or, where appropriate, controls which are required to be installed in the near future.

In many instances, the 2000–2004 time frame was used as a baseline period for BART determinations because this time frame reflected existing controls in use at BART sources at the time BART analyses were performed, following the issuance of the final BART Guidelines in 2005. In Arizona's case, the initial BART analyses were performed in 2007, using baseline periods that varied by source: 2002–2007 for Apache; 2001–2003 for Cholla; and 2001–2003 for Coronado.<sup>64</sup> These periods appear to reflect controls in existence at the time that these BART analyses were performed. Our proposed disapproval of certain aspects of Arizona's BART determinations was not based on any flaw in the choice of baseline period.

However, having proposed to disapprove Arizona's BART determinations for NO<sub>x</sub> on other grounds, we were obligated to conduct our own five-factor BART analyses for NO<sub>x</sub> for these sources. At the time we conducted our analysis in 2011 and 2012, several of these units had been retrofitted with additional NO<sub>x</sub> controls that were not in place between 2000 and 2004. In particular, Cholla had installed LNB on Units 2, 3 and 4 in 2008 to 2009, and Coronado had installed LNB at Unit 1 in 2009.<sup>65</sup> In addition, during this time period, Cholla completed its transition to a different coal with much higher potential NO<sub>x</sub> emissions.<sup>66</sup> Thus, in order to take into account existing controls and to ensure that the baseline period accurately represented

anticipated future emissions, we updated the baseline period for each unit to ensure that it reflected these changes.<sup>67</sup>

With respect to Coronado Unit 2, we also took into account the federally-enforceable emissions limits set by a Consent Decree between the United States and SRP, which was entered in 2008.<sup>68</sup> Again, this is consistent with the BART Guidelines, which provide that:

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.<sup>69</sup>

Consistent with this provision, for Coronado we used the consent decreed-mandated NO<sub>x</sub> emission limit of 0.08 lb/MMBtu in order to ensure that the baseline emissions rate would represent a realistic depiction of anticipated 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 Coronado, the installation of new NO<sub>x</sub> and SO<sub>2</sub> controls was required by a consent decree. With respect to Cholla, the installation of newly installed NO<sub>x</sub> and SO<sub>2</sub> controls coincided with increases in potential emissions of these pollutants resulting from a change in coal supply.<sup>70</sup> Therefore, the more recent baseline is likely to be more representative of future operating conditions at these units.

Contrary to the assertions of some commenters, use of updated baselines did not unfairly penalize those sources that reduced their NO<sub>x</sub> emissions in advance of a final BART determination. Rather, the updated baseline effectively lowered the baseline visibility impacts from these sources by reducing the baseline emissions. As a result, the projected benefits of additional controls

<sup>62</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.4.d.1

<sup>63</sup> CAA 169A(g)(2), 42 U.S.C. 7491(g)(2); see also 40 CFR 52.308(e)(ii)(A).

<sup>64</sup> See, e.g., SIP Appendix D at 4; Apache Unit 2 BART analysis at 2–2; Cholla.

<sup>65</sup> 77 FR 42859, 42861. Although no new NO<sub>x</sub> controls were installed at Apache during this timeframe, we determined that more recent emissions data (2008–2011 rather than 2005–2007) were more likely to represent future emissions. 77 FR 42856.

<sup>66</sup> 77 FR 42856, 42859, 42861.

<sup>67</sup> 77 FR 42861.

<sup>68</sup> Consent Decree in *United States v. Salt River Project*, CV 08–1479–PHX–JAT (entered December 19, 2008).

<sup>69</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.4.d.2.

<sup>70</sup> See Docket Item B–09, "Additional APS Cholla BART response", Appendix B, Section 6.2.

<sup>59</sup> Consent Decree in *United States v. Salt River Project*, CV 08–1479–PHX–JAT (entered Dec. 19, 2008).

<sup>60</sup> 77 FR 9490 (February 16, 2012), codified in Table 2 to Subpart UUUUU of 40 CFR Part 63.

<sup>61</sup> See 40 CFR 51.308(d)(2)(i).



were less than if we had used the original baseline. This approach is consistent with the RHR and the BART Guidelines because it accurately reflects controls in place at the time we performed our BART analysis. Nonetheless, in order to address commenters' concerns about the effect of the updated baselines on our proposed determinations, we have also taken into account the original baseline periods considered by ADEQ, as part of the supplemental cost analyses described below.

Finally, we note that the use of a more recent baseline for purposes of our BART analyses does not alter the baseline used for purposes of measuring reasonable progress. As noted by several commenters, the RHR specifies that, for purposes of setting RPGs and measuring progress:

The period for establishing baseline visibility conditions is 2000 to 2004. Baseline visibility conditions must be calculated, using available monitoring data, by establishing the average degree of visibility impairment for the most and least impaired days for each calendar year from 2000 to 2004. The baseline visibility conditions are the average of these annual values.<sup>71</sup>

In its Regional Haze SIP, Arizona used IMPROVE monitoring data from 2000–2004 to calculate baseline visibility for the best and worst visibility days for each Class I Area.<sup>72</sup> Since these baseline visibility conditions are calculated based on monitored conditions at Class I areas, they reflect actual emissions that occurred during the 2000–2004 time frame, rather than any subsequently implemented controls.

In developing its long-term strategy, a state must consider *inter alia* “[e]missions limitations and schedules for compliance to achieve the reasonable progress goal” and the “anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the next 10 years.”<sup>73</sup> This would include any reductions in emissions from BART sources that are implemented prior to a final BART determination, as well as any reductions resulting from such a determination. Thus, in setting its RPGs for 2018, a state may receive “credit” for any reductions achieved during the first implementation period, regardless of whether or not those reductions are reflected in the “baseline” emissions for a particular BART source.

EPA has not yet proposed action on Arizona's RPGs or long-term strategy. Our ultimate action on these elements of

the plan will take into consideration all emissions reductions achieved during the first implementation period, consistent with the requirements of the CAA and the RHR.

## 2. Control Efficiencies and Emission Reductions for Alternative Controls

*Comment:* One commenter (NPS) concurred with EPA's reliance on an SCR level of performance of 0.05 lb/MMBtu. The commenter noted that this level is consistent with EPA's determination for the San Juan Generating Station in New Mexico and EPA's assumptions for the Colstrip and Corlette power plants in Montana.

*Response:* We acknowledge the commenter's concurrence. As described further below, information received in comments on our proposal continues to support the use of an SCR level of performance of 0.05 lb/MMBtu on an annual average basis. Accordingly, we have retained the use of 0.05 lb/MMBtu in our cost calculations (which are based on annual emissions). However, in setting emission limits on a 30-day rolling average basis, it is necessary to account for startup and shutdown events, which raise the average emission rates over this shorter period of time.

Therefore, we have revised our proposed emission limits for SCR at each of the sources. As explained below, we have also taken into account other site-specific factors in revising the emissions limits. In the case of Apache Units 2 and 3, we have performed a supplemental analysis using AEPCO's cost estimates that are allowed by the CCM (capital costs for the installation of SCR with LNB and OFA of \$164.9 million). We also considered comments, the size of the Apache facility, AEPCO's classification as a small entity, the economic effects of requiring the use of SCR on Apache Units 2 and 3, and AEPCO's arguments regarding an SCR emissions limit of 0.07 lb/MMBtu. As discussed below in this preamble, we have concluded that in this case it is appropriate to revise the 30-day rolling average SCR limit to 0.070 lb/MMBtu, with a “bubble” across Apache Units 2 and 3. In the case of Cholla, we have taken into account the need to accommodate startup and shutdown events in the 30-day rolling average and have revised the limit to 0.055 lb/MMBtu, with a bubble across Units 2, 3 and 4. Finally, in the case of Coronado, we have taken into account both the need to accommodate startup and shutdown events, as well as the existing consent decree, which sets an emission limit of 0.080 lb/MMBtu for Unit 2. Based on these considerations, we have set a two-unit 30-day rolling average

limit of 0.065 lb/MMBtu. For each of the three sources, we have established the compliance determination method such that when one unit is not operating, the emissions from its own preceding thirty boiler-operating-days will continue to be included in the 30-day rolling average. In the case of Coronado, for example, during periods when only one unit operates, this method allows the one operating unit to average out short-term emission spikes by using the most recent thirty boiler-operating-day value from the non-operating unit. Otherwise, averaging across units would not be possible during such periods, since the emissions value from the non-operating unit would be zero since it is not operating.

*Comment:* One commenter (Earthjustice), based on a report submitted with the comments (the “Sahu report”), stated that SCR can achieve greater NO<sub>x</sub> reductions and visibility benefits at less cost than EPA's calculations. According to the commenter, while SCR systems are capable of achieving 90 percent or greater removal, EPA's proposed NO<sub>x</sub> emission limit of 0.05 lb/MMBtu represents control levels of less than 90 percent at each of the Apache, Cholla and Coronado units. Accordingly, the commenter believes that EPA should have analyzed SCR with an emission limit of 0.04 lb/MMBtu because this level is achievable at 90 percent removal.

The commenter (Earthjustice), based on a separate report submitted with the comments (the “Stamper report”), stated that SCR systems are capable of achieving 90 percent or greater removal and EGUs elsewhere are subject to NO<sub>x</sub> emission limits as low as 0.03 lb/MMBtu. The commenter cited several Prevention of Significant Deterioration (PSD) permit limits based on BACT determinations, including a 0.03 lb/MMBtu limit at Plant Washington, issued by Georgia Environmental Protection Division, and 0.035 lb/MMBtu for Desert Rock, issued by EPA Region 9. Accordingly, the commenter believes that EPA should have analyzed SCR with an emission limit of 0.04 lb/MMBtu because this level is achievable at 90 percent control for each of the units.

*Response:* We agree with the information provided by the commenters that SCR technology has the potential to achieve 90 percent and greater rates of removal, as well as achieve emission rates of less than 0.05 lb/MMBtu. However, we disagree with the commenter's assertion that emission limits associated with BART must meet the lowest emission rate achieved with

<sup>71</sup> 40 CFR 51.308(d)(2)(i).

<sup>72</sup> AZ Regional Haze SIP at page 39.

<sup>73</sup> 40 CFR 51.308(d)(3)(v)(G).

that technology at any coal-fired power plant. 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 \* \* \*<sup>74</sup>

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”<sup>75</sup> and that “[t]o complete the BART process, you must establish enforceable emission limits that reflect the BART requirements \* \* \*”.<sup>76</sup> 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 selected as BART. 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 (e.g., Desert Rock), or emission rates achieved from the operation of individual facilities under an emissions trading program (e.g., Clean Air Act Interstate Rule (CAIR)) may provide important information, but should not be construed to automatically represent the most appropriate BART limit for a given technology.

*Comment:* Several commenters (APS, AEPCO, SRP, AUG, Pacificorp) note that the proposed NO<sub>x</sub> emission rate, as based on SCR technology, is more stringent than many other EPA actions. In its comments, SRP provided a contractor’s report that found that the proposed limit is inconsistent with BACT determinations that EPA has approved for new coal-fired units in the following ways:

- Although there have been several units permitted with similar emissions limits, none of these limits are directly equivalent (same numeric limit and

averaging time, including startup and shutdown periods).

- These units are based on new construction, which can be designed to optimize NO<sub>x</sub> reduction in other aspects of combustion (i.e., pulverizer design, boiler height, etc.).

- There is inadequate data available to confirm the long-term achievability of the limits because the units have not begun operation or only recently became operational.

Other commenters note that, as part of the Cross State Air Pollution Rule (CSAPR), EPA concluded that a NO<sub>x</sub> limit below 0.06 lb/MMBtu is not achievable through retrofit of SCR on coal-fired electric generating units.<sup>77</sup> AEPCO and APS also note that based on data from the RACT/BACT/LAER Clearinghouse, new coal-fired EGUs with SCR are only required to achieve 0.05 lb/MMBtu averaged over 12 months, and it is not appropriate to assume that a retrofit coal-fired unit can achieve this limit averaged over 30 days. SRP notes that the proposed limit for Coronado Unit 1 is more stringent than the recently promulgated NSPS for electric utility steam generating units constructed after May 3, 2011 (40 CFR part 60, subpart Da), which establishes a limit of 0.70 lb/MWh (0.077 lb/MMBtu) for new units, and 1.1 lb/MWh (0.11 lb/MMBtu) for modified units. APS also provided a report, originally prepared by RMB Consulting & Research, Inc. (RMB) for comment on the Regional Haze FIP for San Juan Generating Station, suggesting that the Subpart Da limits represent the most stringent level of available control. The RMB report states that EPA’s Guidelines indicate that state regulatory agencies should consider NSPS limits in the BART evaluation except in cases where the NSPS might be considered outdated (e.g., “technology determinations from the 1970s or early 1980s”), which is not the case for the recently promulgated NSPS Subpart Da.

*Response:* We do not agree that our consideration of a NO<sub>x</sub> emission limit of 0.050 lb/MMBtu was inappropriate. We note that, in its submitted comments, Earthjustice identified several recently issued permits that establish emission limits for SCR that are more stringent than our proposal. While limits set as BACT during PSD review may provide important information about the capabilities of various control technologies, they should not be construed to automatically represent (or

in this context, constrain) the determination of what the most appropriate BART limit representative of a given technology is for a given facility. The emission limit set to reflect BART must be determined based on a consideration and weighing of the statutory BART factors. Although there are some similarities between the top-down BACT determination process and the five-step BART determination process, we note that a BACT determination is based almost exclusively on cost-effectiveness, and does not, for example, take visibility improvement at Class I areas into account.<sup>78</sup>

One of the commenters noted that in IPM modeling performed in support of the CSAPR rulemaking, we used an SCR emission rate of 0.06 lb/MMBtu for certain retrofit coal-fired EGUs, stating that this was the most stringent emission rate assumed achievable for retrofit units. It is important to note that IPM is a tool that operates using a large number of variables with values determined based upon a wide variety of assumptions. These assumptions, and the values upon which they are based, will necessarily change based upon the needs and context of the project or rulemaking for which IPM is used. It is therefore not appropriate to automatically consider a particular assumption or variable value (in this case, SCR emission rate) used in one application of IPM to represent a uniform standard or constraint against which all other uses of IPM should be compared.

In the case of the CSAPR rulemaking cited by the commenter, IPM was used to set state-wide budgets for NO<sub>x</sub> based on assumptions that would be minimally achievable to a broad array of covered sources. The emission data and constraints fed into IPM therefore represented sector-wide modeling assumptions, which is a much different use and context than a BART determination, which must “take into account the most stringent emission control level” in order to establish a source-specific emission limit. As a result, we disagree that the 0.06 lb/MMBtu assumption used in the CSAPR rulemaking should be construed to

<sup>78</sup> We note that a Class I area impact analysis must be performed by certain PSD projects as part of the permit application process. However, the visibility results are not used in the BACT determination, which is typically determined prior to performing the visibility modeling, and are not used to determine the appropriate level of control except in those cases where the visibility impact is sufficiently high to warrant mitigation measures that end up involving additional emission reductions.

<sup>74</sup> 40 CFR 51.308(e)(1)(ii)(A).

<sup>75</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.3.

<sup>76</sup> *Id.* section V.

<sup>77</sup> Citing 76 FR 1109, 1115, January 7, 2011; EPA, Transport Rule Engineering Feasibility Response to Comments, Docket ID No. EPA-HQ-OAR-2009-0491-4529, at 13, July 6, 2011.

represent the most stringent emission control level for SCR.

Similarly, we also disagree that the recently promulgated NSPS Subpart Da represents the most stringent emission control level for SCR. First, we acknowledge that while the BART Guidelines state that “EPA no longer concludes that the NSPS level of controls automatically represents ‘the best these sources can install’”<sup>79</sup> this was written in the context of older NSPS subparts with technology evaluations that could potentially be outdated and not representative of current pollution control technology performance. We also acknowledge that, while the BART Guidelines provide for “situations where NSPS standards do not require the most stringent level of available control for all sources within a category” and cite NSPS Subpart GG (stationary gas turbines) as a subpart that does not consider post-combustion controls,<sup>80</sup> the recently promulgated NSPS Subpart Da does consider post-combustion controls such as SCR.<sup>81</sup>

Despite this language, however, we disagree with the commenter’s assertion that NSPS Subpart Da represents the most stringent emission control level for SCR, or that an NSPS Subpart, even a recently promulgated one, should be treated as a “floor” for establishing BART emission limits. While the BART Guidelines provide that, “you may rely on MACT standards for purposes of BART,”<sup>82</sup> they do not indicate that the same is true for the NSPS standards. An NSPS standard must establish an emission rate that is appropriate for all the units within its category,<sup>83</sup> which in the case of Subpart Da includes a variety of boiler types, coal types, and baseline emission rates that may not be representative of the Apache, Cholla, and Coronado units. Specifically in the case of the RMB report, which was prepared for the San Juan Generating Station, the assertion that the Subpart Da standards represent the most stringent level of available control is undermined by the report’s findings that emission modeling indicates that the San Juan units could achieve NO<sub>x</sub> emission rates in the range of 0.047 to 0.068 lb/MMBtu, which are emission rates lower than the Subpart Da standards.

*Comment:* Multiple commenters (AUG, APS, SRP) stated that EPA must consider presumptive BART limits. The

commenters asserted that EPA cannot ignore presumptive BART limits because, as part of the BART Guidelines, they are binding regulatory presumptions that should only be deviated from based on a careful consideration of the BART factors (70 FR 39171).

EPA’s Proposed Rule, however, does not reflect any such consideration. Indeed, EPA’s Proposed Rule never even mentions the presumptive limits except to note that Arizona considered them. (77 FR 42847). The nature of and basis for EPA-established presumptive NO<sub>x</sub> BART limits for the relevant units at Apache, Cholla, and Coronado show that EPA’s determination in its proposed FIP that SCR—a much more costly, post-combustion technology—represents BART at these facilities is, at least, presumptively incorrect. Because EPA failed to consider the presumptive limits in developing its proposed FIP’s BART limits for NO<sub>x</sub>, the Proposed Rule is flawed and must be withdrawn.

The commenters also note that the RHR also established presumptive BART emission limits for NO<sub>x</sub> emissions from fossil fuel-fired units through notice-and-comment rulemaking. The presumptive NO<sub>x</sub> emissions limits for coal-fired EGUs vary according to individual source characteristics, including fuel firing configuration (tangential/wall-fired, opposed wall-fired, cyclone) and type of fuel burned (bituminous, sub-bituminous, lignite, etc.). Commenters also argued that, because EPA shifted the baseline for BART, it did not include combustion controls, such as LNB, in its analysis, and only considered higher cost post-combustion controls (SNCR and SCR).

*Response:* We disagree with the commenters’ assertions that we ignored the presumptive BART NO<sub>x</sub> limits. Because Apache, Cholla and Coronado all have access to and have historically burned both bituminous and sub-bituminous coal,<sup>84</sup> there is no single presumptive NO<sub>x</sub> limit that applies to any of these units.<sup>85</sup> Therefore, rather than rely upon the numerical values of the presumptive NO<sub>x</sub> limits listed in the BART Guidelines, we have considered the technological basis for presumptive NO<sub>x</sub> BART limits, such as the use of combustion control technology, boiler type, and coal type, as part of the five-factor analysis we performed for each

facility. For each source, we considered combustion controls as a potential option for BART.<sup>86</sup>

We also disagree with commenters’ assertions that our selection of non-presumptive BART technology as BART is flawed or presumptively incorrect. 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<sub>x</sub> 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<sub>x</sub> emission limits, unless you determine that an alternative control level is justified based on consideration of the statutory factors.<sup>87</sup>

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:

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.<sup>88</sup>

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. The five-factor analysis we performed for these facilities demonstrates that, taking into consideration the expected remaining useful life and the existing controls present at the facilities, SCR is cost-effective, results in the most visibility improvement of all feasible control technologies, and that these factors are not outweighed by SCR’s potential energy and non-air quality environmental impacts. As a result, regardless of the appropriateness of SCR

<sup>86</sup> At Apache Units 2 and 3, we considered combustion controls (LNB plus OFA) as one of the control scenarios. At Cholla and Coronado, combustion controls were considered as part of the baseline emission rate and were a potential BART option in the event that the five-factor analysis indicated that no additional controls beyond the baseline were justified.

<sup>87</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.E.5.

<sup>88</sup> 70 FR 39132.

<sup>79</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.1, n. 13.

<sup>80</sup> *Id.* section IV.D.1.

<sup>81</sup> 40 CFR Part 60, Subpart Da.

<sup>82</sup> *Id.* section IV.C.

<sup>83</sup> Or subcategories, which Subpart Da does not establish except for “new” and “modified” units.

<sup>84</sup> See, e.g., Final Report, Apache Unit 2 BART Analysis, Table 3–1 (December 2007); Cholla Unit 2 BART Report, page ES–2; SRP Comments on Proposed Rule (September 2012), RMB Technical Memorandum, page 3.

<sup>85</sup> See BART Guidelines, 40 CFR Part 51, Appendix Y, Table 1.

as a control technology for most units on a national scale, our five-factor analyses establish that NO<sub>x</sub> BART limits more stringent than the presumptive limits are appropriate for these units.

### 3. Costs of Compliance

*Comment:* Several commenters stated that EPA inappropriately conducted its cost analysis using generalized data and a regional model, whereas the CAA requires a BART determination to be based, in part, on a site-specific cost evaluation. One commenter (Navajo Nation) stated that EPA should justify its use of the IPM and explain why it did not use or request line item costs from the facilities to make its analysis more site-specific. This commenter also stated that EPA's reliance on the IPM is misplaced because the model integrates health-based regulations and not the RHR.

Another commenter (SRP) added that the proposed rule and the TSD say almost nothing about how IPM was used to calculate costs, instead directing the public to an EPA contractor report for more information. The commenter asserted that no contractor report in the docket for the rulemaking supplies additional detail on precisely how IPM was used. The commenter believes that this failing renders EPA's proposed rule inconsistent with the CAA's public notice requirements.

*Response:* As described in our proposal, the IPM is a multi-regional linear programming model of the U.S. electric power sector. IPM relies upon a very large number of data inputs and provides forecasts of least-cost capacity expansion, electricity dispatch, and emission control strategies for meeting energy demand and environmental, transmission, dispatch, and reliability constraints. EPA has used IPM to evaluate the cost and emissions impacts of proposed policies, such as the recent Mercury and Air Toxics Standard (MATS) to limit pollutant emissions from the electric power sector.

We wish to clarify that, for our proposed action on Arizona's Regional Haze SIP, we did not actually run IPM. Rather, we used one component of IPM, specifically, the component that develops the costs of air pollution control technologies. Broadly speaking, IPM relies upon numerous components and sub-components to specify constraints and variable values that feed into the model algorithms used during an actual IPM model run. The air pollution control cost development component is just one of these numerous components. We relied upon the cost information and equations contained in this component by

manually placing them into a spreadsheet that calculated the capital and O&M costs associated with pollution control options. While we relied upon the results of these spreadsheet calculations, we did not then use those results to run IPM, as the type of information generated by an actual IPM model run (e.g., generation dispatch decisions, capacity decisions) is not relevant to our action. We documented our use of the equations from IPM's air pollution control technology cost component by placing the raw cost calculation spreadsheet in the docket for our proposal.<sup>89</sup> This spreadsheet contained the IPM equations, corresponding variable values, selected notes regarding assumptions and variable ranges as well as selected tables from IPM Base Case v4.10 documentation. Since we did not perform an actual IPM model run, the spreadsheet and contractor's report in the docket for our proposal sufficiently document our use of the cost methodologies from the IPM air pollution control cost component.

We disagree with commenters' characterization of the cost development methodology contained in IPM as generalized or outdated. As noted in the documentation for IPM's cost development methodology for SCR, the cost estimate methodology is based upon two databases of actual SCR projects.<sup>90</sup> These databases include 2004 and 2006 industry cost estimates prepared for the Midwestern Ozone Group (MOG), and a proprietary in-house database maintained by engineering firm Sargent & Lundy (S&L). The MOG information was cross-referenced with actual 2009 projects, and escalated accordingly. S&L then used the information in these databases to develop the equations described in the cost component taking into account the pre-control NO<sub>x</sub> emission level, degree of reduction, coal type, facility size, and numerous other unit-specific factors. While a costly engineering evaluation that included site visits would potentially produce a more refined cost estimate that could be considered more site-specific than our own, we disagree that our approach has produced cost estimates that are either "generic" or "generalized."

*Comment:* Several commenters contended that where specific knowledge is available, the CCM is oriented to allow and provide for the

use of such information. The commenters also note that the RHR explicitly provides that the cost analysis should take into account any site-specific information that affect the costs of a particular BART technology option, and the *Corn Growers* court explained that BART determinations must be made on a source-specific basis.

*Response:* While we agree that BART determinations must be made on a source-specific basis, we do not agree that site-specific information is required for all aspects of a BART analysis. Nonetheless, in order to address commenters' concerns that our proposal was based on cost information that was insufficiently site-specific and that the costs of the SCR with LNB and OFA control option, in particular, are not representative of actual installation costs at these facilities, we have performed a supplemental cost analysis. The supplemental cost analyses for each facility are described in Section IV.D of this document, and incorporate much of the cost information provided by the facilities in their comments. In performing this supplemental cost analysis, we have adopted a "hybrid" approach that relies on cost estimates provided by the facilities for certain line items, but still retains the use of the CCM methodology as described in the following response.

*Comment:* Several commenters stated that EPA's cost estimating techniques are flawed and its reliance on the outdated EPA CCM led to underestimates of costs. Several of these commenters noted that EPA claimed that owner's costs, surcharges and Allowance for Funds Used During Construction (AFUDC) are not allowed by EPA's CCM and refute that these costs are not allowed by the Manual. The commenters state that while the Manual does not have specific line items for owner's costs and surcharges, it discusses some of the items that roll up into these categories. APS, for example, states that:

Owner's costs are home office and plant support costs that are charged directly to specific projects. These would include costs related to project management, engineering, construction support, start-up, training, etc. Surcharges are home office costs associated with a project that may not be charged directly to that project. These costs would be related to overhead loads, procurement, accounting, finance, etc.<sup>91</sup>

APS also notes that there is a line item for AFUDC in the Manual but provides that it is assumed to be zero percent, but that in its experience AFUDC is a real cost and is never zero percent. In

<sup>89</sup> Document ID: EPA-R09-OAR-2012-0021-0008, File name: G-15\_MODELING\_FILES\_EGU\_BART\_Costs\_Apache\_Cholla\_Coronado\_FINAL2.

<sup>90</sup> <http://www.epa.gov/airmarkets/progsregs/epa-ipm/docs/v410/Appendix52A.pdf>.

<sup>91</sup> APS comments, page 12.

addition, the commenters state neither the CAA nor the BART Guidelines require the Manual to be used to determine the costs of compliance.

*Response:* With regard to owner's costs and surcharges, we agree with commenters' assertions that the CCM does discuss some of the items that roll up into these line items as they have described in comments. For the control option of SCR with LNB and OFA, for example, the CCM does provide for "Engineering and Home Office Fees"<sup>92</sup> that could potentially include some of the home office and plant support costs described in comments. These types of costs are often included in estimates under some type of engineering/procurement/project services line item. In the case of the cost estimates provided by the utilities (both those submitted to ADEQ as part of the original BART analysis, and those submitted to us in comments on our proposal), we note that their cost estimates are not organized to list line item(s) that clearly correspond to "Engineering and Home Office Fees," and do not provide information indicating where these costs may be included. As a result, while owner's costs and surcharge are not line items included in the CCM, in this instance, as a conservative assumption, we have included the portion of owner's costs/surcharge in the total cost, up to the value specified for "Engineering and Home Office Fees" indicated by the CCM.

We disagree with commenters' assertions that AFUDC is a cost that should be incorporated into our cost analysis, as it is inconsistent with CCM methodology. 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 SCR (i.e., set to zero) in the CCM.<sup>93</sup> Therefore, in reviewing other BART determinations, EPA has consistently excluded AFUDC.<sup>94</sup>

*Comment:* The ACCCE notes that the Manual specifically states that it does not directly address the controls needed to control air pollution at EGUs, citing the following quote from the Control Cost Manual:

\* \* \* this Manual does not directly address the controls needed to control air pollution at electrical generating units (EGUs) because of the differences in accounting for utility sources. Electrical utilities generally employ the EPRI Technical Assistance Guidance (TAG) as the basis for their cost estimation processes.

*Response:* We disagree with the commenter's assertion that the CCM does not address control costs needed to control air pollution at EGUs. The quote cited by the commenter contains a footnote that reads as follows:

This does not mean that this Manual is an inappropriate resource for utilities. In fact, many power plant permit applications use the Manual to develop their costs. However, comparisons between utilities and across the industry generally employ a process called "levelized costing" that is different from the methodology used here.<sup>95</sup>

The quote is merely a factual observation that electric utilities, in their planning and cost estimating for their own purposes, use a different accounting method than required by the CCM. The footnote clarifies that the CCM is appropriate for utilities for regulatory purposes.

#### 4. Energy and Non-Air Environmental Impacts

*Comment:* One commenter (ADEQ) stated that EPA should consider the

<sup>93</sup> CCM (Tables 1.4 and 2.5 show AFUDC value as zero).

<sup>94</sup> 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 (August 22, 2011) (explaining in the New Mexico Regional Haze FIP that the Manual does not allow AFUDC).

<sup>95</sup> EPA Air Pollution Cost Control Manual, Sixth Edition page 1–3.

costs associated with fly ash ammonia removal in selecting BART. Further, additional problems during disposal of fly ash may cause environmental damage and should not be discounted.

*Response:* EPA disagrees with this comment. First, we note that ammonia adsorption in the fly ash is expected to be minimal from SCR because excess ammonia would likely react with sulfuric acid to form particulate ammonium sulfate or ammonium bisulfate, which would not pose the same odor problem in fly ash reuse as adsorbed ammonia. Second, the facilities' own BART analyses did not include costs of fly ash disposal or ammonia removal in the cost estimates for SCR, which indicates that they do not consider these potential costs to be significant. Finally, we note that the Arizona Department of Transportation has designated fly ash from each of the three sources as approved material.<sup>96</sup> As explained in our proposed rulemaking and the accompanying TSD, the presence of ammonia does not impact the integrity of the use of fly ash in concrete.<sup>97</sup> Therefore, we have no information that suggests that installation of SCR would result in a change to the facilities' current fly ash disposal and re-use practices.

*Comment:* One commenter (SRP) stated that EPA downplayed the energy and non-air quality factor its revised BART determination in the proposed FIP, presenting the narrow conclusion that potential energy and non-air quality impacts do not warrant elimination of any of the otherwise feasible control options for NO<sub>x</sub> at any of the sources. The commenter asserted that this narrow consideration of this factor is not tenable because this factor must be weighed and considered in conjunction with the other BART factors in the overall assessment of what control option constitutes BART for a particular source. The commenter believes that EPA's approach minimizes the role of this factor in a BART analysis, which is beyond EPA's authority.<sup>98</sup>

*Response:* EPA does not agree with this comment. The RHR and the BART Guidelines allow the reviewing authority (State, Tribe, or EPA) the discretion to determine how to weigh and in what order to evaluate the

<sup>96</sup> Approved Materials Source List, Fly Ash, Natural Pozzolan, and Lime, Revised July 10, 2012, available at <http://www.azdot.gov/Highways/Materials/>.

<sup>97</sup> See 77 FR 42853–4284, TSD at 38.

<sup>98</sup> Citing *Corn Growers*, 291 F.3d at 6–7 (finding that EPA's original 1999 regional haze rules had improperly divorced consideration of the BART visibility benefits factor from the other BART factors).

<sup>92</sup> As described in Table 2–5 of the CCM, Engineering and Home Office Fees represent 10 percent of purchased equipment costs.

statutory factors (cost 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), as long as the reviewing authority justifies its selection of the "best" level of control and explains the CAA factors that led the reviewing authority to choose that option over other control levels.<sup>99</sup> In this case, having disapproved the state's BART determinations for NO<sub>x</sub> at several units, "all of the rights and duties that would otherwise fall to the State accrue instead to EPA."<sup>100</sup> This includes a significant degree of discretion in deciding how to weigh the five factors, so long as that weighing is accompanied by reasoned explanation for adopting the technology selected as BART, based on the five factors, and in accordance with the BART Guidelines. EPA has provided a detailed explanation of our BART evaluation process and five-factor analyses in our proposal, TSD and elsewhere in this document. We have weighed the potential energy and non-air environmental quality impacts of the various control options along with the other statutory factors in our BART analyses and have concluded that impacts do not warrant elimination of any of the otherwise feasible control options for NO<sub>x</sub> at any of the sources.<sup>101</sup>

#### 5. Remaining Useful Life of the Source

*Comment:* One commenter (APS) did not dispute EPA's assumption of a twenty-year useful life of the emission control equipment in its annualized cost calculations.

*Response:* EPA agrees with the commenter that this is an appropriate assumption for these sources.

#### 6. Degree of Improvement in Visibility

*Comment:* One commenter (NPS) agreed with EPA that a more complete assessment of visibility improvement for candidate BART controls would include consideration of the number of areas affected and the degree of improvement expected at all Class I areas rather than focusing on a single area. The commenter commended EPA for its reliance on deciview improvement and the number of areas showing improvement, plus its consideration of cumulative improvement, which

provides a supplemental measure that combines information on the number of areas and on individual area improvement.

In contrast, several commenters (ADEQ, AEPSCO, APS and AUG) disagreed that EPA's new visibility metric, "cumulative visibility improvement," is an appropriate metric, asserting that this metric incorrectly inflates the estimated visibility improvements of various control options and should not be used. The commenters further stated that this metric does not appear anywhere in the CAA, RHR or BART Guidelines, and that these rules and guidelines specifically give discretion to states to determine how to take into account visibility impacts in a BART evaluation. In addition, the RHR (at 70 CFR 39170) supports identifying the single Class I area that would have the greatest visibility effects from emission controls and does not support adding improvements from multiple Class I areas in determining visibility effects. The commenters affirmed that EPA should use a change in deciview at the Class I area with the highest impact as its visibility metric, consistent with EPA's RHR and the method used by other EPA regions and states.

The commenters further stated that to be relevant to the environmental effect that the regional haze program addresses, the metric by which visibility improvement is determined for purposes of assessing BART for a particular facility must reflect actual human perception of visibility. The commenters added that the cumulative impact approach used by EPA has no tie to human perception and can only distort a BART analysis. The commenters believe that this approach arbitrarily magnifies the benefit that might be associated with emission limitations at a single source.

*Response:* EPA agrees with NPS on the need to consider visibility improvements at all the nearby Class I areas as part of a comprehensive assessment of the degree of visibility improvement due to BART controls. EPA disagrees with some other commenters that cumulative improvement over multiple areas is an inappropriate metric, or that examining a single Class I area is sufficient. The cumulative improvement metric (i.e., the simple sum of impacts or improvements over all the Class I areas) is not intended to correspond to a single human's perception at a given time and place. The approach is simply one way of assessing improvements at multiple areas, for consideration along with other visibility metrics. Another approach

would be to simply list visibility improvements at the various areas, and qualitatively weigh the number of areas and the magnitudes of the improvements. The cumulative sum is simply an easily understood and objective way of weighing cumulative visibility improvement, as part of the overall BART decision.

*Comment:* One commenter performed NO<sub>2</sub> modeling by scaling tropospheric column NO<sub>2</sub> derived from satellite measurements, as portrayed in imagery from the Institute of Environmental Physics, University of Bremen, Germany. The commenter states that SCR would reduce NO<sub>2</sub> closer to background levels.

*Response:* While the facilities considered for BART control are not the only NO<sub>x</sub> sources in the area, the commenter's scaling of the concentrations in the satellite images according to the reductions expected from SCR can give a rough idea of its NO<sub>2</sub> benefit. However, to assess visibility impacts, the model used must account for the formation of visibility-impairing ammonium nitrate particles. Under the BART Guidelines, CALPUFF is the recommended model that incorporates this nitrate chemistry. Alternative models could potentially be used if they had the ability to handle this and other chemical transformations and had undergone a rigorous performance evaluation.

*Comment:* One commenter (NPS) commended EPA for the thoroughness of its visibility modeling analyses and the methodologies used. The commenter noted that EPA used CALPUFF methods 6 and 8 and modeled against annual average and 20 percent best natural background conditions. The commenter also pointed out that EPA modeled all pollutants while varying NO<sub>x</sub> emissions to evaluate the effects of changing this one pollutant.

*Response:* EPA acknowledges the comment. It was our intention to estimate visibility impacts accurately and transparently so that one could more easily compare results to earlier applications of CALPUFF and clearly understand the effect of old versus revised IMROVE equations (methods 6 and 8) as well as alternative natural background conditions. We modeled all pollutants together in order to account for chemical interactions among the various pollutants and also the nonlinear dependence of deciviews upon extinction.

*Comment:* One commenter (APS) stated that EPA's proposal noted that it is appropriate to use Method 6a, 6b, 8a or 8b in CALPOST within the CALPUFF model, yet EPA inappropriately rejected

<sup>99</sup> See BART Guidelines, 40 CFR Part 51, appendix Y, section IV.E.2.

<sup>100</sup> Central Arizona Water Conservation Dist. v. EPA, 990 F.2d 1531, 1541 (9th Cir. 1993).

<sup>101</sup> See 77 FR 42853-4284, TSD at 38.

ADEQ's use of Method 6a in its own analysis and instead used Method 8b, which yielded higher predicted visibility improvements in Class I areas.

*Response:* EPA did not reject ADEQ's use of visibility method 6a, which remains a viable method for past visibility modeling work under an agreed upon protocol. Method 6a comprises CALPOST Method 6, the old IMPROVE equation for translating pollutant concentration into visibility impacts, and annual average (the "a") natural background concentrations. However, for new visibility modeling, such as EPA performed for the FIP, method 8b is preferable. Method 8b comprises CALPOST Method 8, the revised IMPROVE equation, and best 20 percent of days (the "b") natural backgrounds. The revised IMPROVE equation has superior performance for assessing visibility, and is recommended by the Federal Land Managers for regional haze assessments performed for New Source Review permitting.<sup>102</sup> EPA believes that using the best 20 percent of days as a basis for background concentrations is desirable since visibility impacts due to emissions from facilities are most noticeable on the best days, that is, most visible to visitors of Class I areas. EPA assessed the results of both methods (and also the "6b" and "8a" combinations), but primarily relied on 8b as the most appropriate method in the BART context.

*Comment:* One commenter (APS) objected to EPA shifting the CAA's mandate to compare costs and benefits under the BART program to an assessment of "cost-effectiveness" (\$/ton) without specifying the threshold level of what is cost-effective. APS also noted that in the absence of a specific threshold for cost-effectiveness, the FLMs have referred to a benchmark of \$20 million per deciview as the upper limit. The commenter also presented data showing the incremental costs of going from LNB/OFA to SNCR or SCR to be over \$20 million per deciview for Cholla.

*Response:* The commenter is correct that the BART Guidelines list the \$/deciview ratio as an additional cost-effectiveness metric that can be employed along with \$/ton for use in a BART evaluation, and we have included this information in our proposal. While the FLMs have indicated that they consider \$20 million/dv to be a

benchmark for average cost-effectiveness, we note that the BART Guidelines do not require the development of a specific threshold. The BART Guidelines, however, require that cost-effectiveness be calculated in terms of annualized dollars per ton of pollutant removed, or \$/ton.<sup>103</sup> We considered cost of controls by discussing the total capital costs, annual costs, \$/ton, and incremental \$/ton, and considered the degree of visibility improvement by discussing the individual and cumulative deciview improvement resulting from the various control technology options, as well as the percent change in improvement. Our consideration of other metrics in addition to \$/dv in no way relegates visibility improvement to a secondary role. Finally, we note that the FLMs' recommended "benchmarks" for dollars per deciview are for average dollars per deciview not *incremental* dollars per deciview.<sup>104</sup> Neither the BART Guidelines nor the FLMs recommend consideration of incremental dollars per deciview.

*Comment:* One commenter (NPS) cautioned against any implication in EPA's analyses that visibility improvement must exceed 0.5 dv to be significant. The commenter believes that such an approach would be contrary to the BART Guidelines.

*Response:* EPA agrees that the 0.5 dv threshold for "contribute to visibility impairment" is only for the initial Subject-to-BART screening test and it is a maximum even for that purpose, according to the BART Guidelines.<sup>105</sup> Smaller improvements from controls should be considered in BART determinations, since they can be beneficial in considering effects from controls on multiple sources.<sup>106</sup> We have used the 0.5 dv level simply as one point of comparison, a "benchmark" or "yardstick," to gauge the magnitude of impacts under various control scenarios.

*Comment:* Several commenters (APS, AUG, Navajo Nation, PacifiCorp and SRP) asserted that EPA's proposed NO<sub>x</sub> BART determination rests on a flawed

assessment of visibility impacts. The commenters made the following arguments to support their contention that EPA's modeling overestimates the visibility benefits associated with BART control options. First, EPA used an outdated version of the CALPUFF model (version 5.8) that over-predicts visibility benefits. Based on citations provided by the commenters, CALPUFF version 6.42 has been shown to provide better agreement with observed levels of nitrates. The commenters provided modeling results using CALPUFF version 6.42 for EPA's consideration. Second, EPA's outdated use of constant ammonia background concentration of 1.0 ppb over-predicts visibility benefits and fails to account for known monthly or seasonal variations. EPA inappropriately rejected ADEQ's use of variable background concentrations, which was well within the state's discretion. Several of these commenters also noted that a case study<sup>107</sup> by Terhorst and Berkman based on the 2005 closure of the Mohave Generating Station found virtually no evidence that closure resulted in improved visibility at the Grand Canyon. In addition, SRP stated that EPA must consider visibility benefits from NO<sub>x</sub> controls within the context of nitrate contributions to regional haze. Studies of visibility impairment on the Colorado plateau show that nitrate aerosols contribute only two to five percent to haze.

*Response:* EPA disagrees with the commenters that any new CALPUFF version should be used for the BART determination. EPA relied on version 5.8 of CALPUFF because it is EPA-approved version in accordance with the Guideline on Air Quality Models ("GAQM", 40 CFR 51, Appendix W, section 6.2.1.e). EPA updated the specific version to be used for regulatory purposes on June 29, 2007, including minor revisions as of that date. The approved CALPUFF modeling system includes CALPUFF version 5.8, level 070623, and CALMET version 5.8 level 070623. CALPUFF version 5.8 has been thoroughly tested and evaluated, and has been shown to perform consistently with the initial 2003 version in the analytical situations for which CALPUFF has been approved. Any other version, and especially one with such fundamental differences in its handling of chemistry, would be considered an "alternative model", subject to the provisions of GAQM section 3.2.2(b), requiring full model

<sup>103</sup> BART Guidelines section IV.D.4.c.

<sup>104</sup> See, e.g. National Park Service Comments on Best Available Retrofit Technology for Apache, Cholla, and Coronado Power Plants in Arizona (September 17, 2012) at 6.

<sup>105</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section III.A.1 ("As a general matter, any threshold that you use for determining whether a source "contributes" to visibility impairment should not be higher than 0.5 deciviews.")

<sup>106</sup> See, e.g. 70 FR 39129 ("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.")

<sup>107</sup> Terhorst, Jonathan and Berkman, Mark, "Effect of Coal-fired Power Generation on Visibility in a Nearby National Park", *Atmospheric Environment* 44, 2524, 2530 (Apr. 2010).

<sup>102</sup> Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report—Revised (2010), U.S. Forest Service, National Park Service, U.S. Fish and Wildlife Service, October 2010. [http://www.nature.nps.gov/air/Pubs/pdf/flag/FLAG\\_2010.pdf](http://www.nature.nps.gov/air/Pubs/pdf/flag/FLAG_2010.pdf).

documentation, peer-review, and performance evaluation. No such information for the later CALPUFF versions that meet the requirements of section 3.2.2(b) has been submitted to or approved by EPA. Experience has shown that when the full evaluation procedure is not followed, errors that are not immediately apparent can be introduced along with new model features. For example, changes introduced to CALMET to improve simulation of over-water convective mixing heights caused their periodic collapse to zero, even over land, so that CALPUFF concentration estimates were no longer reliable.<sup>108</sup>

The change from CALPUFF version 5.8 to CALPUFF 6.4 is not a simple model update to address minor issues, but a significant change in the model science that requires its own rulemaking with public notice and comment before it can be relied on for regulatory purposes.

Furthermore, it should be noted that the US Forest Service and EPA review of CALPUFF version 6.4 results for a limited set of BART applications showed that differences in its results from those of version 5.8 are driven by two input assumptions not associated with the chemistry changes in 6.4. Use of the so-called “full” ammonia limiting method and finer horizontal grid resolution are the primary drivers in the predicted differences in modeled visibility impacts between the model versions. These input assumptions have been previously reviewed by EPA and the FLMs and have been rejected based on lack of documentation, inadequate peer review, and lack of technical justification and validation.

Introducing a new regulatory model is a long process. EPA intends to conduct a comprehensive evaluation of the latest CALPUFF version along with other “chemistry” air quality models, including a full statistical performance evaluation, verification of its scientific basis, and determination of whether the underlying science has been incorporated into the modeling system correctly. To accommodate such a model, there would have to be an evaluation of the effect on the regulatory framework for its use, including in New Source Review permitting, and also changes to the Guideline on Air Quality Models and other modeling guidance, in consultation with the FLMs. CALPUFF version 5.8 has already gone through

this comprehensive evaluation process and remains EPA-approved version, and is thus the appropriate version for EPA’s BART determinations of these facilities.

The ammonia issue has already been addressed above. EPA believes that there is no compelling alternative to the use of the default 1 ppb background concentration.

The Terhorst & Berkman study cited by the commenter is worthy of consideration as the Regional Haze program evolves, but one study does not invalidate CALPUFF, which has had multiple performance evaluations and has gone through public comment and rulemaking. It also does not remove the legal requirement to perform BART determinations for eligible facilities.

While nitrate appears to be a smaller contributor to visibility impairment than some other compounds, section 169A of the Clean Air Act requires BART determinations on BART-eligible EGUs regardless of ambient visibility conditions. Application of BART is one means by which we can ensure the continuation of downward emission and visibility impairment trends. Modeling shows maximum visibility impacts of 1.2 to 4.5 deciviews depending on the facility, which are not negligible contributions to visibility impairment. Even if an individual pollutant or source category appears small to some commenters, the many segments of the emissions inventory taken together do cause visibility impairment, and each must be addressed in order to make progress towards the national goal of remedying visibility impairment from man-made pollution. EPA identifies stationary sources as an important category to evaluate under the Regional Haze program, including a BART analysis.

*Comment:* Several commenters argued that the proposed FIP is inconsistent with the goal of the RHR, which is to make progress toward natural visibility conditions by the year 2064. Another commenter added that Arizona’s energy providers have already invested time and money (hundreds of millions of dollars) in order to reach the long-term goal of achieving natural background visibility by 2064, and that the accelerated timeline proposed by the rule would result in astronomical costs. Another commenter stated that EPA is front-loading as many emission reductions as possible in the first five years of this program, while ignoring other causes of visibility impairment, such as fires, in its FIP. Other commenters suggested that Arizona’s haze is produced by a number of environmental factors, like pollution

from wildfires, garbage burning along the Mexico/US border, and dust storms.

*Response:* We do not agree that we are front-loading emission reductions or that we have lost sight of the “end goal.” While the goal of the regional haze program is to achieve natural visibility conditions in all mandatory Class I Federal areas by 2064, the requirement for states to implement BART applies only during the first planning period ending in 2018.<sup>109</sup> Where a State has not met the RHR requirements related to BART, EPA is obligated to disapprove that portion of the State’s submittal. And, as explained elsewhere in this document, because the FIP clock has already expired for the Arizona Regional Haze plan, we are required to promulgate a FIP for any disapproved portion of the SIP. Our action fulfills part of this duty.

We agree that there are various other factors that contribute to haze at Arizona’s Class I areas. However, these other factors are not relevant to the BART requirements, which govern today’s action. Under the RHR, causes of haze other than BART sources are addressed under separate requirements for reasonable progress and a long-term strategy. We will address the remaining requirements of the RHR for the first implementation period in Arizona, including requirements for reasonable progress toward the 2064 goal, in a separate rulemaking action.

#### *D. Source-Specific Comments on EPA’s BART Analyses and Determinations*

##### 1. EPA’s BART Analysis and Determination for NO<sub>x</sub> at Apache Units 2 and 3

###### a. Control Efficiencies

*Comment:* Various commenters (ADEQ, AEPCO and AUG) asserted that EPA’s proposed BART determination for Apache Units 2 and 3 was premised on the assumption that SCR can achieve an emission limit of 0.050 lb/MMBtu continuously on a 30-day rolling average, including periods of startup, shutdown and equipment malfunctions, but that this limit has not been shown to be feasible. They argued that EPA had failed to support either its proposed BART determination or its reliance on this limit in its BART analysis. In addition, AEPCO and AUG stated that EPA inappropriately relied on vendor information to support an emission rate of 0.050 lb/MMBtu using SCR. AEPCO also noted that it considered this support anecdotal and stated that it

<sup>109</sup> See 40 CFR 51.308(f) (future Regional Haze plans must address reasonable progress and long-term strategy, but not BART).

<sup>108</sup> “CALPUFF Regulatory Update”, Roger W. Brode, Presentation at Regional/State/Local Modelers Workshop, June 10–12, 2008; <http://www.cleanairinfo.com/regionalstatelocalmodelingworkshop/archive/2008/agenda.htm>.



cannot form the basis for a BART determination, as BACT rules expressly provide that EPA does “not consider a vendor guarantee alone to be sufficient justification that a control option will work.” AEPSCO requested that if EPA retains the SCR limits, that they be set at 0.07 lb/MMBtu due to the infeasibility of complying with a lower limit at the Apache station. Also, due to the load-following and cycling nature of the units and the need to accommodate startups and shutdowns, AEPSCO requested that any lower limits be set as an annual average limit.

*Response:* We partially agree with this comment. In our proposal, our analysis was based on an SCR annual average design value of 0.050 lb/MMBtu, which was subsequently proposed as a rolling 30-day average emission limit. We disagree that our use of 0.050 lb/MMBtu as an annual average design value is merely anecdotally supported or based on vendor literature/guarantees alone. As discussed in our proposal, the ability of SCR to achieve control efficiencies in the range of 80 to 90 percent is well established. Although the information included in our proposal did include vendor estimates, it also included summaries of SCR control efficiencies that were achieved in practice. We have further supplemented the record to include more recent examples illustrating that SCR, as a technology, is capable of achieving control efficiencies in the range of 80 to 90 percent. For the Apache units, an annual average emission rate of 0.050 lb/MMBtu represents 87 to 89 percent control. While these values represent the upper range of SCR control and are more stringent than the control efficiencies used in the BART analyses prepared by AEPSCO,<sup>110</sup> we reaffirm that these values are appropriate, given that they are still within the range of what is achievable with SCR and that the Apache units are among the highest baseline NO<sub>x</sub> emission rate units considered in our proposal. We agree with the commenter that, when establishing a 30-day rolling average BART emission limit that would apply at all times, it is appropriate to accommodate emissions associated with startup and shutdown events in developing the emission limit. SRP raised similar concerns in comments on Coronado 1 and 2. As discussed in more detail in our responses on Coronado, SRP submitted information suggesting that the Coronado units cannot achieve an SCR emission rate of 0.050 lb/

<sup>110</sup> See Docket Items B-03 and B-04, Appendix A. AEPSCO's calculations are based on 83–85 percent SCR control efficiency, and 24-hour average emission rates of 0.07 lb/MMBtu.

MMBtu on a rolling 30-day average and could only achieve in the range of 0.053 to 0.072 lb/MMBtu.<sup>111</sup> We have reviewed the analyses provided by SRP and note that while the results of SRP's analysis indicate that Coronado could meet a 0.050 lb/MMBtu limit on an annual average basis,<sup>112</sup> we agree that the Coronado units cannot achieve an SCR emission rate of 0.050 lb/MMBtu on rolling 30-day average. As a result, we conclude that 0.050 lb/MMBtu is appropriate as annual average design value, but not as 30-day rolling average emission limit at the Coronado units. While we acknowledge that Apache 2 and 3 are not identical to the Coronado units, we do note the following similarities:

- Both the Apache and Coronado units are of the same boiler type (Riley turbo).
- Both the Apache and Coronado units were constructed and placed into operation at approximately the same time. Construction commenced on the Apache units in 1976, and they were placed into operation in 1979. The Coronado units were placed into operation in 1979 and 1980.
- Both the Apache and Coronado units have access to, and could potentially use, a bituminous and sub-bituminous coal blend.<sup>113</sup>
- Although the historical operating profiles of the Apache and Coronado units are not identical, both the Apache and Coronado units are cycling units that exhibit a greater number of startup and shutdown events than baseload units.

Based on these similarities, we similarly conclude that the Apache units cannot achieve an SCR emission rate of 0.050 lb/MMBtu on a rolling 30-day average, but that use of 0.050 lb/MMBtu as an annual average design value is appropriate. We agree that when establishing a rolling 30-day BART emission limit that is based upon an annual average design value, it is appropriate to provide a compliance margin for periods of startup and shutdown. In addition to considering the boiler type, age of the units, and coal

<sup>111</sup> As discussed in further detail in the responses on Coronado, this range of values corresponds to an SCR unit designed to operate during all periods of normal operation and loading conditions.

<sup>112</sup> As discussed in further detail in the responses on Coronado, this is specifically in regards to Coronado Unit 1.

<sup>113</sup> The Apache units have access to a number of bituminous and sub-bituminous coal blends. See, e.g., Final Report, Apache Unit 2 BART Analysis, Table 3–1 (December 2007). While the Coronado units currently burn 100 percent sub-bituminous Powder River Basin coal, they have historically burned a mixture of PRB with bituminous coal. See SRP Comments on Proposed Rule (September 2012), RMB Technical Memorandum, page 3.

type to which Apache has access, we also note that AEPSCO meets the definition of “small entity” as established for electric utility companies by the U.S. Small Business Administration.<sup>114</sup> We considered AEPSCO's small entity status<sup>115</sup> and how to provide AEPSCO with operational flexibility consistent with application of the five-factor BART analysis. Based on these considerations, we have decided to raise the rolling 30-day average emission limit from the proposed level of 0.050 lb/MMBtu to 0.070 lb/MMBtu. A rolling 30-day average of 0.070 lb/MMBtu represents an upward revision of 40 percent from an annual average design value of 0.050 lb/MMBtu and corresponds to the upper end of the range of lb/MMBtu values considered achievable by SRP's analysis. We consider this magnitude of upward revision appropriate to accommodate emissions from startup and shutdown events, as well to provide AEPSCO a sufficient measure of operational flexibility as a small entity. In addition, in response to comments requesting that emission limits be established across units,<sup>116</sup> consistent with the BART Guidelines,<sup>117</sup> we have decided to set the emission limit as a “bubble” limit across Apache Units 2 and 3. We are therefore finalizing a 30-day rolling average BART emission limit of 0.070 lb/MMBtu for Apache Units 2 and 3 as a “bubble” across these two units.

*Comment:* One commenter (AEPSCO) requested that if EPA establishes an

<sup>114</sup> As noted in our NPRM (77 FR 42867).

<sup>115</sup> See EPA's Action Development Process, Final Guidance for EPA Rulewriters: Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act, November 2006, at 3. This EPA guidance document states that prior to the enactment of the Small Business Regulatory Enforcement Fairness Act, EPA exceeded the requirements of the Regulatory Flexibility Act (RFA) by preparing a regulatory flexibility analysis for every rule that would have any impact on any number of small entities. In view of the changes made by SBREFA, however, EPA decided to implement the RFA as written—a regulatory flexibility analysis as specified by the RFA is not required simply because the rule has some impact on some number of small entities: “Instead, such analysis will be required only in cases where we will not certify that the rule will not have significant economic impact on a substantial number of small entities”, but “It remains EPA policy that program offices should assess the direct adverse impact of every rule on small entities and minimize any adverse impact to the extent feasible, regardless of the magnitude of the impact or the number of small entities affected.”

<sup>116</sup> Although AEPSCO did not specifically request this, this comment was made in comments submitted by Arizona Utility Group on behalf of all of the utilities. As a result, we are also establishing bubble limits for the Apache units.

<sup>117</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section V (“You should consider allowing sources to “average” emissions across any set of BART-eligible emission units within a fence line \* \* \*”).

SNCR limit, that the limits for Apache Units 2 and 3 be set at 0.23 lb/MMBtu. The commenter notes that while there are some differences in past utilization, the units are functionally identical and that, based on the best information available, a limit of 0.23 lb/MMBtu is likely the best consistently achievable limit given the load-following, unit-cycling and startup and shutdown issues that must be addressed as part of unit operation.

*Response:* Although AEPCO stated in comments that “based on the best information available, a limit of 0.23 lb/MMBtu is likely the best achievable limit” and cited unit cycling and startup/shutdown issues, AEPCO did

not provide any information in its comments documenting how or to what extent these issues justify a 0.23 lb/MMBtu emission limit (rolling 30-day average). We note that AEPCO’s original BART analysis also identified an SNCR emission estimate of 0.23 lb/MMBtu, but did not discuss the extent to which startup, shutdown, and malfunction events are accounted for in this emission rate.

We note, however, that SRP also provided information in its comments regarding SNCR performance at Coronado Unit 1. Again, because of the similarities between the Apache units and the Coronado units, we consider it useful to examine information provided

for the Coronado units in evaluating SNCR performance and an appropriate SNCR emission limit for the Apache units. As noted in our responses to comments on Coronado, SRP submitted a conceptual design estimate for SNCR for Coronado 1 that included a vendor estimate of 25 percent control efficiency from LNB emission rates. As noted in our responses for Coronado, while this is less stringent than the 30 percent SNCR control efficiency used by our contractor, we consider it a reasonable estimate. Based upon 25 percent control efficiency, annual average emission rates for the SNCR with LNB and OFA option are presented in Table 2.

TABLE 2—APACHE: SNCR EMISSION RATE ESTIMATE  
[Annual average]

Control technology	Control efficiency (percent) <sup>1</sup>	Apache 2 (lb/MMBtu)	Apache 3 (lb/MMBtu)	Average across units (lb/MMBtu)
OFA .....		0.37	0.44	0.40
LNB+OFA .....	30	0.26	0.31	0.28
SNCR+LNB+OFA .....	25	0.19	0.23	0.21

<sup>1</sup> This represents the incremental control efficiency from the previous control option, not the overall control efficiency from the baseline case of OFA.

If we were to establish a BART emission limit corresponding to the use of SNCR technology, we would use the annual average SNCR emission rates presented in Table 2 as our basis, rather than our original estimates based on 30 percent SNCR control efficiency. As noted in a separate response, when using an annual average design emission rate to establish a rolling 30-day limit that will apply during periods of startup, shutdown, and malfunction, we consider it appropriate to provide some type of measure that provides a compliance margin for such events. First, we would set the SNCR emission limit as a “bubble” limit across Apache 2 and 3. As seen in Table 2, the annual average SNCR emission rate, averaged across both units, is 0.21 lb/MMBtu. A 0.23 lb/MMBtu emission limit, as requested by AEPCO, established on a rolling 30-day average represents an approximate 10 percent increase from the 0.21 lb/MMBtu annual average emission rate. We would consider this magnitude of upward revision appropriate to accommodate startup, shutdown, and malfunction events as well as the unit cycling nature of the Apache units. As a result, if established, we would consider the BART emission limit corresponding to the SNCR with LNB and OFA option to be 0.23 lb/MMBtu, established as a bubble across both units.

For the purposes of our cost calculations or visibility modeling, however, we have retained the use of our original SNCR emission rates. A less stringent SNCR emission rate would, by itself, primarily serve to make the next most stringent control option, SCR, appear to remove a greater amount of emissions. This in turn would make the SCR control option appear more incrementally cost-effective (i.e., by removing a greater amount of emissions, relative to SNCR, for the same cost). As discussed in our proposal and in other responses to comments, we already consider SCR to be cost-effective, and it is not determinative to our decision to find that SCR is “even more” incrementally cost-effective.

b. Costs of Compliance

*Comment:* Two commenters (NPS and Earthjustice) conducted their own analyses of the cost and cost-effectiveness of SCR with LNB and OFA for reducing emissions of NO<sub>x</sub> at Apache Units 2 and 3. NPS used the cost methodologies of the CCM, relied on the IPM to reflect the most recent SCR cost levels, and submitted the detailed calculations as Appendix B to its comments. The commenter’s analysis yielded cost-effectiveness values of \$2,392/ton to \$3,144/ton. The commenter noted that EPA’s analysis yielded cost-effectiveness values of

\$2,275/ton to \$2,908/ton, which EPA considers cost-effective. According to Earthjustice, when the cost-effectiveness of SCR is calculated using more accurate costs and proper baselines, the result is a cost-effective SCR investment that reduces NO<sub>x</sub> at a cost of \$2,640/ton at Unit 2 and \$2,275/ton at Unit 3.

*Response:* Based upon a review of the commenters’ calculations, we recognize that there are certain aspects of cost calculations that would result in lower \$/ton values under different assumptions. As noted in our proposal, we already consider the SCR with LNB and OFA control option to be cost-effective at \$/ton values that are somewhat higher than those calculated by the commenters. As a result, we decline to modify our estimates of cost-effectiveness to reflect these comments, as it is not in any way determinative to our decision to find that SCR is “even more” cost-effective or that the incremental cost-effectiveness value between SCR and SNCR is “even more” incrementally cost-effective.

*Comment:* One commenter (AEPCO) stated EPA underestimated the site-specific costs for installing SCR at Apache, due principally to EPA’s substitution of general data used in the IPM model for the site-specific data used by ADEQ. The commenter stated that EPA needs to reevaluate its numbers in light of AEPCO’s site-

specific analysis. For operation and maintenance costs, AEPCO estimates total costs of \$1,760,000, which is slightly lower than EPA's estimate of \$1,822,463, with the main difference due to EPA's higher allowance for maintenance. For the base unit costs, EPA used a 25 percent reduction factor for "low dust" for Unit 3. AEPCO's vendors do not believe there will be any substantial reduction in cost based on "low dust," and estimates that installed costs will be approximately \$39,094,000 compared to EPA's estimate of \$33,279,000 for this unit. AEPCO estimates that the bare module cost will be near \$48,119,000, rather than the \$25,599,000 that EPA estimates, because EPA only included costs for induced draft (ID) fan upgrades and did not account for the additional costs of upgrading existing or running new electrical service to support the additional electrical loads required by SCR. The commenter also stated that

EPA did not include contractor indirect costs and contingency with the capital, engineering and construction costs, nor did EPA include any owner's costs or allowance for funds during construction, including interest during construction. AEPCO does not believe EPA should disallow these costs. AEPCO's estimates with these costs are \$85,666,000, compared with EPA's estimate of \$33,279,000.

The commenter stated that based on AEPCO's estimated installed costs of SCR, the cost burden is disproportional to the benefits. Adding the costs of SCR to EPA's estimate for LNB and OFA, the annualized cost is \$3,508 per ton and \$13.9 million per deciview.

Another commenter (ACCCE) stated that EPA's proposal to require SCR at Apache Units 2 and 3 must be abandoned due to the high costs of SCR. The commenter notes that according to EPA's estimates, costs of SCR with LNB and OFA would be about \$6 million for

each unit, while the annualized costs of LNB and OFA estimated by ADEQ are only about \$533,000 per unit. In addition, the commenter notes that the marginal improvement in visibility with SCR over LNB and OFA would be less than 1 deciview.

*Response:* We disagree with commenters' assertions that we underestimated the costs of SCR, or that the cost of SCR is disproportional to its benefits. In developing our proposed action for Apache Units 2 and 3, we examined the cost estimates for the SCR with LNB and OFA control option contained in AEPCO's original BART analysis.<sup>118</sup> By comparison, the SCR with LNB and OFA cost estimates we developed for our proposed action<sup>119</sup> do not differ significantly. A comparison of capital cost, total annual cost, and cost-effectiveness for these two estimates are summarized in Tables 3 and 4.

TABLE 3—APACHE UNIT 2: COST COMPARISON OF SCR WITH LNB AND OFA

	Capital cost (\$)	Total annual cost (\$/yr)	Emissions removed (tpy)	Average cost-effectiveness (\$/ton)
EPA estimate .....	\$44,779,657	\$5,869,299	2,019	\$2,908
AEPCO original estimate .....	48,740,300	6,102,740	3,250	1,878

TABLE 4—APACHE UNIT 3: COST COMPARISON OF SCR WITH LNB AND OFA

	Capital cost (\$)	Total annual cost (\$/yr)	Emissions removed (tpy)	Average cost-effectiveness (\$/ton)
EPA estimate .....	\$43,812,028	\$6,103,078	2,683	\$2,275
AEPCO original estimate .....	48,740,300	6,062,302	2,778	2,182

We note that while we used a different cost estimation methodology than AEPCO, our estimates of capital cost and total annual cost are very similar to the company's original estimates and differ, for example, by only 8 percent and 4 percent (respectively) at Apache Unit 2. More importantly, we note that AEPCO's original estimates for Apache Units 2 and 3 actually show lower \$/ton values than our own, meaning that AEPCO's original estimate indicates that SCR with LNB and OFA is cost-effective.

In submitted comments, AEPCO provided multiple analyses comparing our SCR (stand alone) cost estimate with revised estimates prepared by engineering firm Burns and

McDonnell.<sup>120</sup> AEPCO provided two sets of revisions: one in which it retained our assumptions regarding costs not included in the CCM, such as AFUDC and owner's costs, and another set in which it included those costs. In both cases, these analyses also contained revisions in order to reflect capital costs and O&M costs that AEPCO considered more representative and appropriate for the Apache units. These revisions included the following:

- Higher bare module SCR costs, involving the inclusion and upward revision of specific constituent cost items (e.g., concrete and piling, ductwork);
- Use of lower cost reduction for the low-dust SCR design as reflected in bare module cost (10 percent cost reduction,

compared to a 25 percent cost reduction used in our estimate);

- Use of higher capacity factor (0.85 for both units, compared to 0.62 and 0.71);
- Lower SCR NO<sub>x</sub> removal efficiency (based on an SCR emission rate of 0.07 lb/MMBtu, compared to 0.05 lb/MMBtu);
- Inclusion of an additional 15 percent engineering, procurement, contracting fee (not included in our cost estimate); and
- And certain other different assumptions regarding O&M costs that result in similar total O&M costs.

AEPCO then included our estimate of LNB and OFA costs with its SCR (standalone) costs to arrive at its overall cost estimate for the SCR with LNB and OFA control option. As discussed elsewhere in this preamble, we have decided to finalize a 30-day rolling average BART emission limit of 0.070

<sup>118</sup> Docket Item No. B-01, Arizona Regional Haze SIP, Appendix D, page 49.

<sup>119</sup> See 77 FR 42856, Table 16.

<sup>120</sup> The analysis was included in Attachment 1 to AEPCO's Comments on the page titled "SCR Capital Cost Comparison."

lb/MMBtu for Apache Units 2 and 3, and a “bubble” across these two units to provide AEPCO an adequate margin for compliance. Although this 30-day limit accommodates the possibility of multiple startups in a given 30-day period, we expect such spikes to be smoothed out over the course of a year, so that the annual average remains closer to 0.05 lb/MMBtu. For the other

items noted above, such as bare module SCR costs, we are willing to defer to AEPCO’s judgment on these issues in order to address AEPCO’s concerns that our cost estimate was insufficiently site-specific. As a supplemental cost estimate, we have used the version of AEPCO’s cost estimate that adheres to our assumptions regarding costs that are allowed by the CCM. As shown in Table

5, this results in revised SCR with LNB and OFA cost-effectiveness values of \$3,450/ton and \$2,973/ton for Apache 2 and 3, respectively, that are still within a range that we consider cost-effective when considered in conjunction with the visibility improvement associated with SCR.

TABLE 5—APACHE 2 AND 3: COST ESTIMATE OF SUPPLEMENTAL SCR WITH LNB AND OFA

Parameter	Apache 2	Apache 3	Notes
SCR Capital Cost (\$)	71,938,250	71,938,250	1
LNB+OFA Capital Cost (\$)	10,543,189	10,543,189	2
SCR+LNB+OFA Capital Cost (\$)	82,481,439	82,481,439	
Interest Rate (percent)	7.0	7.0	
Equipment Lifetime (years)	20	20	
Capital Recovery Factor	0.094	0.094	2
Annualized Capital Cost (\$/yr)	7,785,664	7,785,664	
Fixed O&M (\$/yr)	466,000	466,000	1
Variable O&M (\$/yr)	1,294,600	1,294,600	1
Total Annual O&M (\$/yr)	1,760,600	1,760,600	
<b>Total Annual Cost (\$/yr)</b>	<b>9,546,264</b>	<b>9,546,264</b>	
Heat Rate (MMBtu/hr)	2,316	2,223	2
Baseline Emission Rate (annual average lb/MMBtu)	0.371	0.438	
SCR Emission Rate (annual average lb/MMBtu)	0.050	0.050	2
SCR Control Efficiency (percent)	87	89	
Annual Capacity Factor	0.85	0.85	1
Baseline Emissions (tpy)	3,198	3,625	
SCR Emissions (tpy)	431	414	
Emissions Removed (tpy)	2,767	3,211	
Annual Cost (\$/yr)	9,546,264	9,546,264	
Emissions Removed (tpy)	2,767	3,211	
<b>Average Cost-Effectiveness (\$/ton)</b>	<b>3,450</b>	<b>2,973</b>	

*Comment:* One commenter (AEPCO) stated that according to EPA’s estimates of SNCR costs, the incremental costs of SNCR with LNB and OFA compared to LNB and OFA are \$3.3 million with a maximum incremental improvement of 0.47 dv at Chiricahua Wilderness Area. The commenter stated that this improvement in deciviews is insignificant compared with cost.

*Response:* As described above, EPA is not limited to considering incremental costs and benefits in comparing BART alternatives. The visibility benefits of SNCR at Chiricahua are a full 1 deciview with an annual cost of \$6.6 million and a cost-effectiveness of \$2,056 \$/ton averaged over the two emitting units. In this case, even the incremental cost-effectiveness of \$2,837 \$/ton is well within the range that we consider cost-effective. The incremental visibility benefit of 0.47 dv is also substantial, and additional benefits would occur at multiple Class I areas. Considered as a contribution to visibility impairment, EPA disagrees that this improvement from SNCR is insignificant.

*Comment:* One commenter (AEPCO) stated that the Appendix Y BART Guidelines (40 CFR 51, App. Y, section IV.E.3.2) provide that the State and EPA must consider the economic effects of BART determinations. AEPCO estimates that to install and operate SCR with LNB and OFA, rates would need to rise by more than 17.5 percent. Further, the units could have to shut down if the cost of power from those units is out of line with the cost of power in the open market. Moreover, due to contract expirations, AEPCO has no certainty that even its existing 147,643 meters will be available to defray costs. AEPCO asserted that these factors are exactly the types of circumstances that were designed to be acknowledged in the BART Guidelines.

One commenter (AEPCO) stated that EPA failed to follow the requirements of CAA section 51.308 and Appendix Y in its cost analysis by failing to review the affordability of the final cost on AEPCO as a single facility cooperative, but rather examined only the cost per ton and the cost per deciview. EPA should also consider the implications of AEPCO’s cooperative status and its

limitations in obtaining funding for capital improvements. As a single generating station, with multiple units subject to BART requirements, the cooperative is unable to spread costs over unaffected units, other facilities or a large system of units and ratepayers. Also, as a cooperative, AEPCO is owned by its members and cannot sell stock or other equities to raise funding, and must seek long-term financing from the Rural Utilities Service, which has a limited budget and is being asked to fund efforts for other cooperatives and rural utilities to meet CAIR, CSAPR, other SIP initiatives, and the upcoming EGU MACT. In addition, the terms of AEPCO’s mortgage agreement would necessitate a rate increase of more than 16 percent to accommodate SCR, and it is not certain whether the Arizona Corporation Commission (ACC) would grant such a rate increase or what the long term impact would be on AEPCO’s working and patronage capital.

AEPCO also stated that the operating and financing costs are unreasonable for the Apache plant. EPA estimates the SCR system alone will have operating and maintenance costs of \$3.3 million,

which is 35 percent of AEPSCO's total net revenue of \$9.5 million for 2010 and more than the net revenue of \$1.9 million for 2011. AEPSCO estimates that it will need to increase rates by \$22.5 million a year over the O&M costs just to finance SCR with LNB and OFA on Units 2 and 3. This combined cost is 14 times AEPSCO's net revenues in 2011 and 2.8 times 2010 net revenues. This cost does not include other expenditures that will be required for Units 1, 2 and 3 for BART. With only 147,643 metered customers and with many of these customers in low income areas, rate increases for these customers are not trivial. The commenter also stated that SNCR also is not affordable due to the operating costs. AEPSCO estimates SNCR with LNB and OFA operating costs to be \$6.8 million, which is three times AEPSCO's net revenue 2011 and over two-thirds of net revenues in 2010.

Another commenter (Earthjustice) stated that SCR costs will not threaten AEPSCO's continued viability or have a severe impact on its operations, which are the only two affordability conditions allowed to be considered under the BART Guidelines (Appendix Y, Section IV.E.3.). The commenter noted that guidance and case law on Reasonably Available Control Technology (RACT) and BACT determinations, which make clear that affordability issues are given relatively little weight, are instructive for BART determinations due to the similar analysis. For RACT and BACT, the commenter explained that Congress intended that all sources in a source category bear similar costs for pollution reduction and that sources should not be able to avoid cost-effective controls due to poor financial position, as this would reward inefficient or poorly-managed sources. The commenter cited two cases regarding RACT and BACT economic feasibility (*Michigan v. Thomas*, 805 F.2d 176, 180 (6th Cir. 1986), *Nat'l Steel Corp., Great Lakes Steel Div. v. Gorsuch*, 700 F.2d 314, 324 (6th Cir. 1983)). The commenter also noted that detailed economic data is required for sources to raise affordability issues under RACT and BACT, and the detailed economic analysis called for in the BART Guidelines should be similarly robust where EPA considers affordability issues for "unusual circumstances." The commenter also stated that Apache's continued viability is not threatened, based on a report by Paul Chernick at Resource Insight Inc., which shows that AEPSCO's average operating margin over the last four years would cover 185 percent of the annual debt repayment

for the SCR system, and the current equity capital of \$94 million in 2011 would cover the entire cost of installation. The report also shows that AEPSCO will receive refunds from a settlement with two railroads totaling \$63 million. The commenter further refuted that AEPSCO may not be able to borrow sufficient funds for SCR. The commenter stated that RUS loan funds are not raised or subsidized by taxpayers, and the RUS does not anticipate any shortage in funding. In addition, the commenter claimed that the National Rural Utility Cooperative Finance Corporation (NRUCFC) is financed by private investors, and AEPSCO should not have any difficulty borrowing from the NRUCFC, if necessary.

Another commenter (ACCCE) stated that the large costs of SCR may adversely impact AEPSCO and its customers due to AEPSCO's small size, the low income profiles of AEPSCO's service area, and AEPSCO's ability to obtain financing. The commenter urges EPA to give full consideration to AEPSCO's comments submitted June 29, 2012, on these issues.

Commenters from AEPSCO's member cooperatives stressed the unique economic and engineering challenges they face—low population density, the demands of servicing vast remote areas with rugged topography, and transmission grid capacity limitations that make it difficult to import power. They noted that the majority of their power comes from the Apache Generating Station, so the cost impact of SCR installation would be especially acute, resulting in rate increases ranging from an estimated 15 percent to 30 percent. The commenters pointed out that their customer base has average incomes well below the national and Arizona averages, and would be especially hard hit by large rate increases; many customers struggle to pay their power bills as it is. The commenters stated that AEPSCO and the associated cooperatives cannot finance or absorb the costs of SCR at the Apache Generating Station. The commenters indicated that closure of the large, load-following coal-fired units would threaten the reliability of the electrical system, particularly with the limited capacity of the local grid to import power from other areas.

Another commenter (Earthjustice) cited a report by Paul Chernick at Resource Insight Inc., which estimates that any rate increases at Apache would be limited to a 2 percent to 5 percent increase at most, resulting in an average extra cost of \$3.28 per month on customer bills. The commenter stated

that this is reasonable, as average annual increases have been up to 3 times as high as this increase, and this rate will likely be offset by a settlement award of \$63 million. The commenter also noted that while the incomes of its customer base are relatively low, the cost of living in the area is also lower than the national average. The commenter further noted that utilities in similarly economically disadvantaged areas have successfully installed modern pollution controls costing significantly more than the cost of SCR at Apache.

*Response:* It is not EPA's intention to endanger the economic viability of Apache Generating Station or to place an undue burden on AEPSCO's customers. EPA has considered the comments on these issues very carefully. Regarding the legal basis for our decision, neither the CAA nor the RHR requires states or EPA to consider the affordability of controls or ratepayer impacts as part of a BART analysis. Rather, the CAA and RHR 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."<sup>121</sup>

The BART Guidelines do allow for (but do not require) the consideration of "affordability" as part of the "costs of compliance" under certain circumstances, noting that:

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 \* \* \* Any analysis may also consider whether other competing plants in the same industry have

<sup>121</sup> CAA section 169A(g)(2), 42 U.S.C. 7491(g)(2); 40 CFR 51.308(e)(1)(ii)(A).

been required to install BART controls if this information is available.<sup>122</sup>

We interpret the question of affordability as a specific question of whether the viability of continued plant operations will be affected by the pollution control technology in question. Although one commenter asserted that the costs of SCR with LNB and OFA could cause a shutdown of Apache Units 2 and 3 if it causes power costs from those units to be out of line with the cost of power on the open market, the commenter did not provide evidence or analysis that supports this assertion. We agree that the terms of AEPSCO's mortgage require AEPSCO to have sufficient revenue to meet the financial metrics of Times Interest Earned Ratio and Debt Service Coverage ratio. But AEPSCO is eligible to finance additional debt related to air pollution controls, and it has not shown that such financing is unavailable to it. Securing a rate increase from ACC may be time consuming, and thus supports our decision to grant AEPSCO five years for installation of such controls. However, the information provided to us does not show that installation of SCR would affect the viability of continued plant operations. AEPSCO is not being treated differently from other competing plants in its industry: many other electric utilities, including other rural electric cooperatives, are also being required to install BART controls.

Nonetheless, we performed additional analysis to understand better the impacts of the proposed pollution controls on AEPSCO as a small entity. As we explained in our proposal, the U.S. Small Business Administration (SBA) defines an electric utility company as small if, including its affiliates, it is primarily engaged in the generation, transmission and/or distribution of electric energy for sale and its total electric output for the preceding fiscal year did not exceed 4 million megawatt hours (MWh).<sup>123</sup> In 2011, AEPSCO member cooperatives sold 2,453,272 MWh of electricity.<sup>124</sup> As explained in the proposal, we conducted an initial assessment of the potential adverse impacts on AEPSCO of requiring SCR with LNB and OFA. Using publicly available information, EPA estimated that the annualized cost of requiring SCR in Units 1 and 2 would likely be in the range of 3 percent of AEPSCO's assets and between 6 and 7 percent of

AEPSCO's annual sales. We noted in the NPRM that the projected costs of SCR with LNB and OFA are approximately \$12 million per year, and that this exceeds AEPSCO's net margins of \$9.5 million in 2010 and \$1.9 million in 2011,<sup>125</sup> although the report by Paul Chernick at Resource Insight Inc., submitted by Earthjustice, notes that AEPSCO's margin in 2008 was \$17.4 million.

In addition to conducting this initial economic impact assessment, we requested information from AEPSCO on the economics of operating Apache Generating Station and what impact the installation of SCR may have on the economics of operating Apache Generating Station. We received a description of plant conditions and potential economic effects before the NPRM was published,<sup>126</sup> and received additional information during the comment period. We noted in the NPRM that if our analysis of this information indicated that installation of SCR would have a severe impact on the economics of operating Apache Generating Station, we would incorporate such considerations in our selection of BART.

The BART cost figures provided in this final action do not include other expenditures that will be required for Apache Units 1, 2 and 3 to meet the BART emission limits included in Arizona's Regional Haze SIP. Under the CAA, EPA is not permitted to consider economic feasibility when taking action on a SIP.<sup>127</sup> To the extent these costs are relevant to our FIP action, we note that AEPSCO did not provide any cost estimates for the required upgrades to the existing ESPs and scrubbers at Apache Units 2 and 3 and estimated that the total first year annualized cost of the required controls at Apache Unit 1 (LNB and FGR) would be \$0.552 million.<sup>128</sup> These costs are two orders of

magnitude lower than the SCR costs described elsewhere in this document. Therefore, even if we were to take them into account, they would not substantially affect our analyses.

Regarding the comment that the cost of SCR with LNB and OFA at Apache could be covered with funds from AEPSCO's operating margins or legal settlements, while Apache Generating Station does have annual operating margins that vary according to various conditions, it is not necessarily true that AEPSCO can cover the costs of pollution control equipment exclusively from these funds, or from the settlement agreement mentioned in the comment. Because AEPSCO is a member-owned utility, operating margins and other surplus funds may be earmarked to be returned to its member cooperatives on a rotating basis. While some of these funds may be available for capital expenditures such as pollution controls, we have assumed for the purpose of our analysis that financing will be necessary to achieve the pollution reductions required by our action.

For electric utilities, EPA has not customarily analyzed or considered ratepayer impacts in BART determinations.<sup>129</sup> Nevertheless, we also analyzed ratepayer impacts in an effort to assess the potential effects of our action on AEPSCO as a small entity. EPA requested an electricity rate analysis through our contractor, EC/R Inc., to assist us in evaluating the possible electricity rate increases discussed in the comments above. Our contractor noted that AEPSCO's analysis appears to place the entire burden of the incremental capital and O&M costs on its Member Co-ops and their retail customers. However, the analysis should account for a share of the SCR cost going to off-system sales volumes and not only allocated to member rates. The contractor's Incremental Cost Model calculated an increment in revenue requirements for AEPSCO's member cooperatives of 12.7 percent under the scenario that spreads the incremental SCR cost across all kWh produced at Apache, both Member Co-ops and off-system or non-Member sales. Under the alternative scenario that the incremental cost for SCR is covered exclusively by member cooperatives, the incremental revenue

calculations and thus the cost-effectiveness of the various control options considered. See 77 FR 4284.

<sup>129</sup> 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, and 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.

<sup>122</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.E.3.

<sup>123</sup> 77 FR 42866–42867; see also 13 CFR 121.201, footnote 1.

<sup>124</sup> Annual Report for year ending December 31, 2011, from AEPSCO to Arizona Corporation Commission.

<sup>125</sup> See Docket Item H–1 Arizona Electric Power Cooperative, Inc. Annual Report Electric for Year Ending December 31, 2011 submitted to Arizona Corporation Commission Utilities Division, available at [http://www.azcc.gov/Divisions/Utilities/Annualpercent20Reports/2011/Electric/Arizona\\_Electric\\_Power\\_Cooperative\\_Inc.pdf](http://www.azcc.gov/Divisions/Utilities/Annualpercent20Reports/2011/Electric/Arizona_Electric_Power_Cooperative_Inc.pdf).

<sup>126</sup> Docket Item C–16, Letter from Michelle Freeark (AEPSCO) to Deborah Jordan (EPA), AEPSCO's Comments on BART for Apache Generating Station, June 29, 2012.

<sup>127</sup> *Union Electric Co., v. EPA*, 427 U.S. 246, 255–66 (1976); 42 U.S.C. 7410(a) (2).

<sup>128</sup> Arizona Regional Haze SIP, Appendix D, Table 10.3; see also Comments of Arizona Electric Power Cooperative, Inc., Proposed Disapproval of AZ RH SIP and EPA's Proposed RH BART FIP (September 18, 2012) page 9. In our proposal, we noted that these control cost calculations include costs that are disallowed by EPA's Control Cost Manual, such as owner's costs and AFUDC. Both of these elements have the effect of inflating cost

requirement was 15.4 percent.<sup>130</sup> As explained in the preceding responses, this analysis is based on a capital cost for the installation of SCR with LNB and OFA of \$164.9 million, which matches the costs claimed by AEPSCO in their comment letter minus certain charges excluded by EPA CCM. This difference in the estimated capital cost for SCR also accounts for much of the discrepancy between AEPSCO's and Earthjustice's estimates of electricity rate increases, since Earthjustice's

estimate was based on the capital cost estimates originally published in our NPRM.

AEPSCO sells electricity through its member cooperatives, and not directly to residential and business customers, but EC/R also analyzed the impact of an increase in the cost of electricity generation on the monthly bills of electricity users serviced by AEPSCO's Member Co-ops. Table 6 indicates the incremental retail costs of electricity to end users under the two scenarios

mentioned above. The potential rate increases for residential users in 2019, the first full year of incremental capital expenditures for pollution controls installed in 2017 (and the year with the largest incremental cost impact), range from 4.5 percent, or \$5.75 per month over 2011 rates, to 10.6 percent, or \$10.75 per month over 2011 rates.<sup>131</sup> EC/R noted that the assumptions it made in constructing its model may cause the impact to rates to be conservatively overstated.

TABLE 6—INCREMENTAL RETAIL COSTS DUE TO SCR  
[As 2019 costs would impact 2011 retail rates]

Scenario	Range of outcomes	Residential class only			Combined residential, commercial & industrial		
		Percent Increase (percent)	Average \$ per year per customer	Average \$ per month per customer	Percent Increase (percent)	Average \$ per year per customer	Average \$ per month per customer
A: Members Pay all SCR Costs.	Low .....	5.4	\$83	\$6.92	5.8	\$125	\$10.42
	High .....	10.6	129	10.75	12.0	220	18.33
B: Members Pay Portion of SCR Costs.	Low .....	4.5	69	5.75	4.8	103	8.58
	High .....	8.8	107	8.92	9.9	182	15.17

While these projected rate increases are not trivial, they are comparable to average historical rate increases for AEPSCO, Arizona, and U.S. ratepayers.<sup>132</sup> They are also projected to occur seven years in the future. Again, in discussing the limitations of this retail rate analysis, EC/R noted that the results of the retail rate assessment should be considered conservative by design.

Regarding the comment that utilities in similarly economically disadvantaged areas have successfully installed modern pollution controls costing significantly more than the cost of SCR at Apache, we note that none of the installed controls listed in Earthjustice's comment letter were installed under the RHR. Accordingly, EPA cannot rely on them as precedents for the Apache Generating Station BART analysis.

Regarding the comment on the economic vulnerability of AEPSCO's ratepayer population, EPA reviewed the supplemental information on per capita and median household incomes. Because electric utility bills are likely paid at the household and not individual, or per capita, level, we believe that median household income is an appropriate metric for assessment. We used census data to compare

household income levels in the areas served by AEPSCO's Class A member cooperatives to average household incomes in the United States. In 2011 the median income for U.S. households was \$50,502. Using the supplemental information provided by AEPSCO, we calculated that the median income for AEPSCO's Member Co-ops' ratepayers was \$49,303. In addition, we aggregated the data on median household income by zip code into four incomes ranges. Seventy-one percent of the median household incomes by zip code were in the \$40,000 and above income ranges and twenty-nine percent were in the median household income range of \$20,000 to \$39,999. We found that the household incomes in AEPSCO's Member Co-ops' service area are in the same range as average U.S. household income, so an increase in AEPSCO's electricity rates should not cause greater hardship than a similar increase elsewhere in the country.<sup>133</sup> EPA's responsibility under the CAA and the RHR is to implement BART at Apache Generating Station. As discussed elsewhere in this document, the five-factor analysis indicates SCR with LNB and OFA represents BART for NO<sub>x</sub> at Apache Units 2 and 3. While the

analyses conducted by EPA and the commenters attempted to project the revenue requirements and possible rate increases that would be required if SCR with LNB and OFA are required at Apache, BART and other environmental regulatory requirements form only one part of the complex business conditions under which utility rate decisions take place, especially over extended time periods. It is the responsibility of utility companies to work with the appropriate regulatory agencies to implement any necessary rate changes in a manageable fashion.

Accordingly, because neither these projected rate increases nor any submitted information or analysis indicate that a requirement to install SCR with LNB and OFA will affect the viability of Apache Generating Station, EPA is finalizing its determination that this level of control represents BART. However, we are also taking into account AEPSCO's status as a small entity as part of our determination. In particular, in its comments on our proposal, AEPSCO requested that "EPA set the final BART limits in terms of lb/MMBtu only and not as a specified technology" to provide AEPSCO with

<sup>130</sup> Apache Plant: Report on SCR Incremental Cost Assessment. Prepared by Energy Strategies, LLC for EC/R, Inc. (November 2012).

<sup>131</sup> *Id.*

<sup>132</sup> Energy Information Administration (EIA) State Historical Tables for 2011, Released: October 1, 2012. Average Price by State by Provider, 1990–2011. [http://www.eia.gov/electricity/data/state/avgprice\\_annual.xls](http://www.eia.gov/electricity/data/state/avgprice_annual.xls), last accessed November 5, 2012.

<sup>133</sup> Arizona Regional Haze SIP, BART Determination for Apache Generating Station, Supplemental Economic Analysis. Memorandum from Larry Sorrels and Robin Langdon, EPA Office of Air Quality Planning and Standards (November 5, 2012).

“maximum flexibility.”<sup>134</sup> AEPCO also requested that if EPA decided to finalize emission limits consistent with SCR that the limits be set at 0.07 lb/MMBtu.<sup>135</sup> Given the unusual status of AEPCO as a small entity and a rural electric cooperative, we believe that it is consistent with EPA policy to minimize adverse impact to this small entity to the extent that such action is feasible and consistent with our BART analysis. To allow this small entity the maximum flexibility that is consistent with our analysis of the five factors, we have determined that it is appropriate to set the BART limit as a 30-day rolling average 0.070 lb/MMBtu limit, with a five year compliance deadline. As AEPCO noted, this approach may allow minor changes in configuration of the optimal system to allow AEPCO’s compliance at somewhat lower cost. This 30-day rolling average 0.070 lb/MMBtu limit is also applied as a “bubble” across Units 2 and 3. This approach allows for short term emission spikes from startups and provides this small entity with additional operational flexibility within the constraints of the BART emissions limit.

*Comment:* One commenter (AEPCO) stated that EPA should not consider fuel switching from the current mix to all natural gas at Apache Unit 1 to be costless. AEPCO states that if it loses the ability to use multiple fuels, its negotiating leverage with natural gas suppliers will be greatly reduced, and it will not be able to obtain gas at reasonably competitive rates. AEPCO argued that this cost at Apache Unit 1 should be considered by EPA in its overall evaluation of the affordability of controls at Apache.

*Response:* EPA is approving ADEQ’s emissions limit for Apache Unit 1. As noted by the commenter, Tables 6 and 7 of our proposed action (77 FR 42844) listed “fuel switch to PNG” as a control option in the context of the PM<sub>10</sub> and SO<sub>2</sub> BART analyses, in addition to “fuel switch to low-sulfur fuel oil.” The annualized costs for both options were listed as zero in both analyses. The information contained in Tables 6 and 7 does not represent our analysis for Apache Unit 1, but reflects the information contained in ADEQ’s PM<sub>10</sub> and SO<sub>2</sub> BART analyses. ADEQ’s BART analyses for Apache 1 eliminated more stringent control technologies such as fabric filters and wet FGD, and determined that a fuel switch to natural gas was BART. Natural gas is a commodity, and its price fluctuates due to factors beyond the constraints on

AEPCO’s ability to use multiple fuels. However, the BART emissions limit we are establishing for Apache Units 2 and 3 will still allow AEPCO a choice of using multiple fuels across the units at the Apache facility.

#### b. Visibility Improvement

*Comment:* One commenter (NPS) agreed with EPA’s analysis of the visibility impacts of the alternative NO<sub>x</sub> control options for Apache Units 2 and 3 at the various impacted Class I areas, as presented in EPA’s TSD, including EPA’s conclusions that “the improvements from SCR are substantially greater than for the other candidate controls” and that “the modeled degree of visibility improvement supports SCR as BART for Apache.” The commenter also indicated that it compiled BART analyses data from across the United States, which revealed that the average cost per deciview proposed by either a state or a BART source is \$14 to \$18 million. The commenter pointed out that for all of the NO<sub>x</sub> control options at the Apache plant, including SCR, both the \$/max deciview and the \$/cumulative deciview are well below this range.

*Response:* We acknowledge the commenter’s agreement with our analysis. Our supplemental analysis, discussed in more detail above, was conducted using a capital cost for the installation of SCR with LNB and OFA of \$164.9 million. For the 0.070 limit on Apache Units 2 and 3 that we are finalizing in this action, this supplemental analysis found an average cost per deciview (\$/max deciview) of \$12.7 million and a cumulative average cost per deciview (\$/cumulative deciview) of \$3.1 million.

#### c. Other Comments

*Comment:* One commenter noted that EPA is required by the Executive Order on Environmental Justice to consider all potential economic and environmental impacts on minorities and low-income populations that its decisions on BART, in this case, will have on AEPCO and its customers. The commenter stated that over four in ten of AEPCO’s customers are minorities. In similar remarks, another commenter cautioned EPA that such increases would impact at-risk populations.

*Response:* In establishing BART requirements for the facilities in this final rulemaking, EPA is increasing the level of environmental protection for all affected populations by requiring substantial NO<sub>x</sub> emission reductions. Thus, EPA does not expect any disproportionately high and adverse human health or environmental effects

on any population, including any minority or low-income population from our final action. Disadvantaged populations also will be able to enjoy the visibility improvements in Class I areas anticipated from the emissions reductions required by this final rulemaking.

EPA took several steps to ensure transparency and meaningful participation in the rule development process for this BART FIP. In response to numerous requests, we extended the public comment period on our proposal and increased the number of public hearings in Arizona from one to three. In addition, all three hearings had Spanish language interpretation services and the hearing on August 14 in Holbrook, Arizona, also offered interpretation in Diné.

We disagree that Executive Order 12898 requires EPA to consider the economic effects of our proposed action on disadvantaged populations. As EPA’s Environmental Appeals Board (EAB) has explained:

Executive Order 12898 instructs federal agencies to address, as appropriate, “disproportionately high and adverse human health or environmental effects of [their] programs, policies, and activities on minority and low-income populations \* \* \*.” The Executive Order, thus, speaks to human health and environmental effects; it does not require federal agencies to consider issues regarding cost or rate changes.<sup>136</sup>

Therefore, Executive Order 12898 does not require us to consider potential economic effects. Nonetheless, as explained elsewhere in this document, in consideration of AEPCO’s status as a small entity and consistent with EPA policy encouraging consideration of the potential social and economic impacts of EPA actions,<sup>137</sup> we have conducted an analysis of the affordability of installing SCR at Apache Units 2 and 3. This analysis indicates that installation of SCR would not affect the viability of continued plant operations at Apache and would result in an average rate increase for residential member utility customers of (at most) \$11 per month in 2019 compared to 2011 rates.

*Comment:* One commenter indicated that because AEPCO is a small electric cooperative, EPA is required by the Regulatory Flexibility Act to prepare a regulatory flexibility analysis for this rulemaking.

<sup>136</sup> In re: Upper Blackstone Water Pollution Abatement District, Order Denying Review In Part and Remanding In Part, NPDES Appeal Nos. 08–11 to 08–18 & 09–06. (May 28, 2010) slip op at 105. (internal citation omitted).

<sup>137</sup> See, e.g., Interim Guidance on Considering Environmental Justice During the Development of an Action page 4, footnote 4.

<sup>134</sup> AEPCO Comments page 18.

<sup>135</sup> *Id.*



*Response:* We agree that AEPCO is considered small entity for purposes of the Regulatory Flexibility Act (RFA). However, the RFA does not require a regulatory flexibility analysis when a rule has an impact on only *one* small entity (as opposed to a significant impact on a substantial number of small entities). Nonetheless, EPA policy is to assess the direct adverse impact of every rule on small entities and minimize any adverse impact to the extent feasible, regardless of the magnitude of the impact or number of small entities affected. Therefore, we gave AEPCO additional opportunities to participate in the rulemaking process. Specifically, prior to issuing our proposed rule, we informed AEPCO that our proposed action would address BART requirements for units at AEPCO's Apache facility. We also requested information from AEPCO on the economics of operating Apache Generating Station and what impact the installation of SCR may have on the economics of operating Apache Generating Station. We have considered the comments we received concerning AEPCO's status as a small entity and the potential economic impact of our proposed action on AEPCO. Our discussion of affordability above includes our response to these comments and delineates the changes we made from our initial proposal in order to give AEPCO flexibility as a small entity. We have also taken into consideration the potential impact of the reporting, recordkeeping, and other compliance requirements of this rule, as set forth in the regulatory text. Because AEPCO is an electric utility that is already subject to reporting, recordkeeping and other compliance requirements under the CAA, AEPCO already has access to the professional skills necessary for the preparation of the reports and records necessary for compliance with the FIP.

## 2. Cholla Units 2, 3 and 4

### a. Selection of Baseline Period

*Comment:* Several commenters asserted that EPA incorrectly and inappropriately changed the control baseline period in its NO<sub>x</sub> BART analysis for Cholla. APS and PacifiCorp contend that the 2011 NO<sub>x</sub> emissions were already controlled by LNB and OFA at Cholla Units 2, 3 and 4, which penalized APS and PacifiCorp for their voluntary use of these controls. In addition, since LNB and OFA were already in use, EPA inappropriately only considered higher cost post-combustion controls (SCR and SNCR) in its BART analysis. If the baseline

remained 2001–2006, LNB and OFA would also have been considered in the analysis. APS noted that EPA concurred with ADEQ's BART determination for SO<sub>2</sub> and PM<sub>10</sub> emissions for these same units using a baseline of 2001–2006. In addition, one commenter (Earthjustice) asserted the baseline period (2008–2011) understates NO<sub>x</sub> emissions reductions compared to the baseline period of 2001–2004.

In contrast, one commenter (NPS) concurred with EPA's use of 2011 as the baseline period for Cholla units 2, 3 and 4 since it represents the first complete calendar year at which it is certain that the Cholla plant operated using the full quantity of a higher NO<sub>x</sub>-emitting coal that the plant is committed to purchase under its current coal contract. The commenter submitted a graph of annual NO<sub>x</sub> emission rates for the units at the Cholla plant, which the commenter believes to show the impact of recently added combustion controls and higher-NO<sub>x</sub> coal.

*Response:* As explained in a previous response, we do not agree that use of the updated baseline for Cholla was incorrect or inappropriate. Moreover, updating the baseline did not eliminate LNB and OFA from consideration as BART, since existing controls can constitute BART if additional controls are not warranted based on the five-factor analysis. For example, EPA recently approved a determination by Colorado that existing LNB at Comanche Units 1 and 2 constituted BART where “the State determined that the added expense of achieving lower limits through different controls was not reasonable based on the high cost-effectiveness [\$9,900/ton] coupled with the low visibility improvement (under 0.2 dv) afforded.”<sup>138</sup> In this case, by contrast, the cost-effectiveness of post combustion controls is reasonable and the expected visibility improvements are substantial, as explained below. Nonetheless, in order to address the commenter's concerns that we did not properly consider LNB and OFA as a potential control option and therefore precluded a BART determination of LNB and OFA, we have used a baseline period of 2001–2003, which corresponds to the period used in APS's original BART analysis. Our supplemental cost analysis for Cholla is summarized in Table 10.<sup>139</sup>

<sup>138</sup> 77 FR 18052, 18066 (March 15, 2012) (Proposed Rule); pre-publication version of Final Rule, signed September 10, 2012, available at: <http://www.epa.gov/region8/air/FinalActionOnColoradoRegionalHazePlanSep2012.pdf>.

<sup>139</sup> A spreadsheet titled “Supplemental Cost Analysis 2012–11–15.xls” is in the docket.

### b. Control Efficiencies

*Comment:* In arguing against the achievability of EPA's proposed limit, one commenter (APS) noted that according to the study that EPA placed in the docket (IPM Model—Revisions to Cost and Performance for APC Technologies, 2010, Sargent & Lundy), the Agency's minimum emissions limit of 0.05 lb/MMBtu is specific to Powder River Basin coal and the minimum level for bituminous coal is 0.07 lb/MMBtu. The commenter also stated that because this is a minimum emissions level, it is probably too aggressive even for a BART determination based on bituminous coal. The commenter also stated that these rates may be appropriate for new units under ideal conditions as BACT are not appropriate for BART.

Another commenter (AUG) stated that EPA's record in support of the putative achievability of a 0.050 lb/MMBtu emission limit at Apache, Cholla, and Coronado is extremely thin and unpersuasive. AUG states that EPA has not, for instance, demonstrated through the development of an SCR conceptual design or some other, similar site specific analysis that SCR can achieve this emission rate at any of these particular facilities, and that EPA must affirmatively establish that its selected BART rate is in fact achievable at these facilities.

In addition, AUG asserted that EPA's proposed limit of 0.050 lb/MMBtu is inconsistent with the following EPA actions:

- As part of CSAPR, EPA concluded that a NO<sub>x</sub> limit below 0.06 lb/MMBtu is not achievable through retrofit of SCR on coal-fired electric generating units.<sup>140</sup>
- In EPA's proposed rule for North Dakota, EPA based its BART analysis on a 0.05 lb/MMBtu emission rate, but then proposed to adopt a 0.07 lb/MMBtu limit because EPA concluded the more stringent rate would not allow a sufficient margin of compliance (citing 76 FR 58570, 58610, September 21, 2011).
- In its final rule for South Dakota, EPA set a NO<sub>x</sub> limit of 0.10 lb/MMBtu for an electric generating plant to allow for an adequate margin of compliance (citing 77 FR 24845, 24848, 24849, April 26, 2012).
- In Colorado's recently approved regional haze SIP, the NO<sub>x</sub> BART for Craig Station is an emission rate of 0.27 lb/MMBtu based on SNCR and SCR for their units and the NO<sub>x</sub> BART for

<sup>140</sup> Citing 76 FR 1109, 1115, January 7, 2011; EPA, Transport Rule Engineering Feasibility Response to Comments, Docket ID No. EPA-HQ-OAR-2009-0491-4529, at 13, July 6, 2011.

Hayden Station is an emission rate of 0.07 lb/MMBtu for one unit and 0.08 lb/MMBtu at another unit based on SCR.

*Response:* We disagree that the SCR emission rate for the Cholla units should be established at 0.07 lb/MMBtu per IPM guidance for bituminous coal. Based on the coal information provided in the original Cholla BART analyses,<sup>141</sup> the Lee Ranch/El Segundo Mine coal being used at Cholla does exhibit some properties that would fall in the range of bituminous coal (nitrogen and moisture content), but also exhibits properties that fall in the range of sub-bituminous coal (fixed carbon, heat value). As a result, we do not agree that the Lee Ranch/El Segundo coal can clearly be classified as a bituminous coal.

More broadly, we disagree with commenters' assertion that 0.05 lb/MMBtu (rolling 30-day average) is an inappropriate SCR emission limit for the Cholla units. Although BART determinations are performed on a site-specific basis, the process for establishing the technical feasibility of a control technology and its associated emission performance level are described in the BART Guidelines as follows:

It is important, however, that in analyzing the technology you take into account the

most stringent emission control level that the technology is capable of achieving. You should consider recent regulatory decisions and performance data (e.g., manufacturer's data, engineering estimates and the experience of other sources) when identifying an emissions performance level or levels to evaluate.

In 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. However, you should explain the basis for choosing the alternate level (or range) of control in the BART analysis. Without a showing of differences between the source and other sources that have achieved more stringent emissions limits, you should conclude that the level being achieved by those other sources is representative of the achievable level for the source being analyzed.<sup>142</sup>

We therefore disagree with commenters' assertion that the BART Guidelines require a SCR conceptual design or other site specific engineering analysis in order to demonstrate a level of performance. The BART Guidelines indicate that one should take into account the most stringent emission control level that the *technology* is capable of achieving and then document any special circumstances for selecting an alternate level or range of control in the BART analysis.

In our proposal, we explained that SCR, as a technology, can achieve a level of performance between 80 to 90 percent reduction, even on a retrofit basis, and especially when combined with LNB and OFA. Although the commenters indicate that they do not consider our support for this position persuasive, they have not specifically disputed the claim that SCR can, as a technology, achieve this level of performance. We have included additional documents, including vendor experience lists of SCR projects, which indicate that SCR has been capable of achieving this level of performance.<sup>143</sup> In determining whether special circumstances exist at the Cholla units that may justify using a different range of control, we examined the Clean Air Markets Database (CAMD) for tangential coal-fired units operating with SCR, either stand alone or in conjunction with LNB and OFA, and on a retrofit basis. We identified the 10 best such performing units, and have listed them in Table 7. In addition, we have listed their best-performing annual average emission rate as well as the percent reduction associated with that emission rate by comparing it to annual average emission rates from its pre-SCR period of operation.<sup>144</sup>

TABLE 7—BEST PERFORMING TANGENTIAL COAL-FIRED EGUS WITH RETROFIT SCRS

State	Facility name	Unit ID	SCR Emission rate		Control efficiency (percent)	Control technology
			(lb/MMBtu)	Year		
TX .....	W A Parish .....	WAP7	0.038	2007	73	SCR <sup>1</sup>
TX .....	W A Parish .....	WAP8	0.038	2006	77	SCR <sup>1</sup>
VA .....	Chesterfield Power Station .....	6	0.041	2009	89	SCR+LNB+COFA/SOFA
NC .....	Marshall .....	3	0.045	2011	85	SCR+LNB+SOFA
TN .....	Kingston .....	6	0.051	2009	88	SCR+LNB+SOFA
TN .....	Kingston .....	8	0.052	2009	88	SCR+LNB+SOFA
TN .....	Kingston .....	9	0.052	2009	89	SCR
TN .....	Kingston .....	7	0.054	2009	88	SCR+LNB+SOFA
MN .....	Boswell Energy Center .....	3	0.054	2009	86	SCR+LNB+SOFA
TX .....	Sandow .....	4	0.059	2011	83	SCR+LNB+SOFA

<sup>1</sup> In the case of the Parish units, we note that their <80 percent control efficiency is the result of low pre-SCR emission rates.

In the case of the Cholla units, which are also tangential coal-fired EGUs, our estimate of the level of performance of the SCR with LNB and OFA control option corresponds to 80 to 85 percent control efficiency, which is in the low-to mid-range of SCR performance. We used these control efficiencies in our cost calculations on an annual average basis, and in our visibility modeling on

a 24-hour average basis.<sup>145</sup> Although the commenters have stated that they disagree with this level of control efficiency and the emission rate associated with it, they have not submitted information for the Cholla units documenting special circumstances that would justify a lower effective range of control efficiency for SCR. In fact, we note that certain aspects

of APS's own BART analyses for the Cholla units are based upon control efficiencies in a similar range. The original BART analyses performed by APS and submitted to ADEQ included visibility modeling indicating that SCR with LNB and OFA can achieve in the range of 83 to 86 percent control efficiency for Cholla Units 2, 3 and 4. APS calculated these control

<sup>141</sup> "Additional APS Cholla BART response", Appendix B.

<sup>142</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.3.

<sup>143</sup> Kurtides, Ted "Lessons Learned from SCR Reactor Retrofit", Presented at COAL-GEN (August 6-8, 2003); Hitachi SCR/NO<sub>x</sub> catalyst experience (February 2010); Haldor Topsoe SCR catalyst reference list (October 2009); Institute of Clean Air Companies, "White Paper—Selective Catalytic

Reduction Control of NO<sub>x</sub> emissions from Fossil Fuel-fired Electric Power Plants" (May 2009).

<sup>144</sup> "Tangentially-fired coal unit SCR retrofit emission data."

<sup>145</sup> See 77 FR 42859, Table 18.

efficiencies based upon the difference between the highest 24-hour average emission rate observed over a 2001–

2003 baseline period and a 24-hour average SCR emission rate of 0.07 lb/

MMBtu. This information is summarized in Table 8.

TABLE 8—SCR WITH LNB AND OFA CONTROL EFFICIENCY ESTIMATE [APS estimate]

Unit	Baseline NO <sub>x</sub> emissions (24-hour average)			SCR+LNB+OFA Emission rate	
	(lb/MMBtu) <sup>1</sup>	Control tech	Period	(lb/MMBtu)	Control efficiency <sup>2</sup> (percent)
Cholla 2 .....	0.503	CCOFA	2001–03	0.07	86
Cholla 3 .....	0.410	CCOFA	2001–03	0.07	83
Cholla 4 .....	0.415	CCOFA	2001–03	0.07	83

<sup>1</sup> Per Table 2–1 of the original BART analysis for each unit, Docket Items B–06 through B–08.  
<sup>2</sup> Per Appendix A of the original BART analysis for each unit, Docket Items B–06 through B–08.

APS submitted updated visibility modeling to us as part of comments on our proposal, and with the exception of Cholla Unit 2, the baseline emissions and associated SCR control efficiencies do not differ from the original analysis.<sup>146</sup> We note that APS did not

use SCR emission rates consistent with these control efficiencies in other aspects of its BART analysis, such as on an annual average basis in cost calculations. If the control efficiencies calculated by APS are applied to baseline annual average emission rates,

the Cholla units can achieve the values in Table 9. These values are consistent with our own estimates of SCR with LNB and OFA performance, and support the use of a 0.05 lb/MMBtu emission rate, on an annual average basis, in our cost calculations.<sup>147</sup>

TABLE 9—SCR WITH LNB AND OFA EMISSION RATE [Per APS Control Efficiency Estimate]

Unit	Baseline NO <sub>x</sub> emissions (Annual ave)			SCR+LNB+OFA emission rate	
	(lb/MMBtu)	Ctrl tech	Period	Control efficiency (percent)	(lb/MMBtu)
Cholla 2 .....	0.326	CCOFA	2001–03	86	0.045
Cholla 3 .....	0.304	CCOFA	2001–03	83	0.052
Cholla 4 .....	0.296	CCOFA	2001–03	83	0.050

With regard to establishing the BART emission limit of 0.05 lb/MMBtu on a rolling 30-day average, the commenters note that in the proposed Regional Haze FIP for North Dakota, we stated the following for the Milton R Young Station Unit 1, a coal-fired boiler for which we also proposed a NO<sub>x</sub> BART determination based on the use of SCR technology:

In proposing a BART emission limit of 0.07 lb/MMBtu, we adjusted the annual design rate of 0.05 lb/MMBtu upwards to allow for a sufficient margin of compliance for a 30-day rolling average limit that would apply at all times, including startup, shutdown, and malfunction.<sup>148</sup>

The commenter also notes that we approved South Dakota’s Regional Haze

SIP that established a BART emission limit of 0.10 lb/MMBtu (30-day rolling) for Big Stone I, based on the use of SCR technology, also citing a need for compliance margin for BART limits that must apply at all times including startup, shutdown, and malfunction (77 FR 24849). We agree with the commenter that it is appropriate to accommodate startup and shutdown events when establishing a rolling 30-day BART emission limit. Since these events, particularly startup, generate elevated levels of emissions, the particular day during which such an event occurs will appear as a short-term “spike.” On an annual average basis, such short-term spikes can be averaged with 365 other values that allow them

to be “smoothed out.”<sup>149</sup> Since the limit was established on a shorter averaging period than the design basis (from 365 days to 30 days), there are fewer days (i.e., data values) with which such short-term spikes can be “smoothed out.” In the instances noted by the commenter, a less stringent value (from 0.05 to 0.07 for MR Young 1) was established for the shorter averaging period.

In order to accommodate emissions from startup and shutdown events, we are finalizing two revisions to our proposed emission limit of 0.050 lb/MMBtu (rolling 30-day average). First, we are finalizing the limit as a “bubble” limit across Cholla Units 2, 3 and 4. By establishing the rolling 30-day limit

<sup>146</sup> In the visibility modeling submitted a part of their comments, APS apparently identified a higher maximum 24-hour average value from the 2001–2003 baseline period than the one identified in Table 8 for Cholla Unit 2. This results in an estimated SCR with LNB and OFA control efficiency of 87 percent.

<sup>147</sup> In addition, APS’s comments also included an SNCR design estimate based upon LNB performance of 0.22 lb/MMBtu. Achieving an SCR emission rate of 0.05 lb/MMBtu from this emission rate would represent only 77 percent control efficiency. This is well within the range of what SCR can achieve, even with a lower inlet NO<sub>x</sub> emission rate.

<sup>148</sup> 76 FR 58610.

<sup>149</sup> The precise method by which such short term spikes will be ‘smoothed out’ over the period of a year will vary based upon the precise compliance determination methodology. The suggestion that it would be averaged with the other 364 days’ values is just a generic description of one type of averaging process.

across all three units, this allows the spike in emissions associated with a startup/shutdown event at one unit to be smoothed with the emission values from the other operating units. Second, we are also finalizing a less stringent value in order to establish an emission limit that accommodates the startup and shutdown events associated with the operating profile of the Cholla units. In determining what magnitude of revision is appropriate, we examined the emissions of the Cholla units, as reported to CAMD, over a 2001–2003 baseline period.<sup>150</sup> We calculated annual average emission rates and 30-day rolling average emission rates using a calculation methodology corresponding to a bubble limit across all three units.<sup>151</sup> Based on this methodology, we determined that the maximum annual average emission rate for these units was approximately 0.32 lb/MMBtu, while the maximum 30-day rolling average emission rate was approximately 0.35 lb/MMBtu. This represents an 8 percent difference between the highest rates observed on an annual and 30-day rolling average. We recognize that this variability between annual average and 24-hour average emission rates is based on operation of the Cholla units with LNB and OFA, and may not be directly representative of the variability associated with operation of SCR. We are therefore finalizing an emission rate of 0.055 lb/MMBtu as a bubble limit across Cholla Units 2, 3 and 4, which represents a 10 percent upward revision from the annual average design value. When combined with the 3-unit bubble, this represents an emission limit that we consider appropriate to ensure design and operation of the emission control system to provide the best available retrofit control.

*Comment:* EPA based LNB/SOFA emission rates on 2011 NO<sub>x</sub> emissions rates, which is not an accurate assessment of the capability of the installed LNB and SOFA. Arizona set the BART limit for Cholla Units 2, 3 and 4 at 0.22 lb/MMBtu. All three units were able to meet this limit in their acceptance test after LNB and SOFA were retrofitted, and APS believes they can meet it long term. In addition, an SNCR design study performed by Black and Veatch indicated that an SNCR system could obtain a control efficiency of approximately 25 percent, which would correspond to an emission rate of 0.17 lb/MMBtu. EPA's cost and

visibility estimates must be updated to reflect these levels.

*Response:* We partially agree with this comment. In submitted comments, APS provided a conceptual design estimate for SNCR which was based upon 25 percent control efficiency (incremental from LNB) and a resulting emission rate of 0.17 lb/MMBtu. While this control efficiency is less than the 30 percent control efficiency used by our contractor, we consider it to be a reasonable estimate based upon the vendor quotes provided by APS.<sup>152</sup>

We disagree with the use of an LNB emission rate of 0.22 lb/MMBtu, as the Cholla units have not demonstrated a consistent ability to operate at this emission rate under the current coal contract for Lee Ranch/El Segundo coal. Based upon a review of CAMD emission data since the installation of LNB, we acknowledge that the Cholla units have, to varying degrees, operated with LNB at emission rates consistent with APS's assertion of 0.22 lb/MMBtu during this period. However, as noted in our proposal, calendar year 2011 represented the first year at which the Cholla plant operated at the "full" minimum purchase quantity under its new contract for Lee Ranch/El Segundo coal, which is a higher NO<sub>x</sub>-emitting coal than what was previously used. Since the beginning of 2011 to September 2012, Cholla Units 3 and 4 have operated at or below an emission rate of 0.22 lb/MMBtu for only five to six months of this 21 month period, and Cholla Unit 2 has not operated at or below this emission rate in any month during this period.<sup>153</sup> Therefore, an LNB emission rate of 0.22 lb/MMBtu is not supported by the actual recent operation of the Cholla units, so it is unlikely to be an appropriate representation of anticipated future emissions.

#### c. Costs of Compliance

*Comment:* One commenter (APS) stated that, for EPA's capital costs estimate, no back-up material was provided, even when directly requested by APS. This lack of information makes it impossible for APS to comment on the validity of EPA's cost estimates. The commenter also stated that EPA has not established its contractor or subcontractor responsible for the costs estimates as experienced in the engineering, procurement and

<sup>152</sup> Black and Veatch's report cites lower inlet NO<sub>x</sub> concentrations to the SNCR system. A lower inlet NO<sub>x</sub> emission rate makes it more difficult to reduce NO<sub>x</sub> emissions, which makes a lower removal efficiency reasonable.

<sup>153</sup> "Cholla CAMD emission data (monthly) 2010–12."

construction of utility-scale air quality control systems.

*Response:* We disagree with the commenter's assertion that we have not provided sufficient information regarding our cost calculations. In the docket for our proposal, we included the raw cost calculation spreadsheets that contain the cost calculation equations, corresponding variable values, selected notes regarding assumptions and variable ranges, as well as selected tables from the IPM Base Case v4.10.<sup>154</sup> In addition, web links were also provided (both in the raw cost calculation spreadsheet and in our proposal) to the location on the publicly available EPA Web site that contains full IPM documentation. We note that both SRP and AEPSCO were able to locate this spreadsheet, as both utilities submitted control cost estimates as part of their comments that revised certain variable values and assumptions in our contractor's raw calculation spreadsheet. This information was initially developed by EPA contractors<sup>155</sup> and was reviewed by EPA staff. Following the close of the public comment period on our proposed rulemaking, APS provided additional information concerning its own cost estimates. We have placed this information to the docket and taken it into account as part of this final rulemaking, as explained below.

*Comment:* One commenter (APS) stated that EPA's cost-effectiveness numbers in the proposed FIP are incorrect. The commenter stated that EPA used a capital recovery factor of 9.4 percent, assuming an interest rate of 7 percent, but APS states that a capital recovery factor of 13.4 percent should be used to account for income and property taxes and the cost of capital authorized by ACC in the last rate case. The commenter also stated that EPA analysis uses emissions factors for SCR that are not appropriate for the type of coal used, the units, or the averaging period. In addition, APS noted the cost values used in the IPM model and EPA's CCM may be outdated, which may also lead to underestimation of the true costs. APS estimates cost-effectiveness ranging from \$7,719/ton to \$8,894/ton, with incremental costs ranging from

<sup>154</sup> Document ID: EPA-R09-OAR-2012-0021-0008, File name: G-15\_MODELING\_FILES\_EGU\_BART\_Costs\_Apache\_Cholla\_Coronado\_FINAL2

<sup>155</sup> Specifically, the initial cost estimates were developed by Jim Staudt of Andover Technology Partners. While there is no requirement for EPA to establish that its contractors are "experienced in the engineering, procurement, and construction of utility-scale air quality control systems," Dr. Staudt has extensive expertise and experience in the field of air pollution control at power plants. See: [www.andovertechnology.com/staudt.html](http://www.andovertechnology.com/staudt.html).

<sup>150</sup> "Cholla CAMD emission data (daily) 2001–03"

<sup>151</sup> Please consult the regulatory language in our final action for the NO<sub>x</sub> compliance determination methodology associated with the bubble limit.

\$8,759/ton to \$10,329/ton compared to EPA's estimates of \$3,115/ton to \$3,473/ton, with incremental costs ranging from \$3,257/ton to \$3,813/ton. APS included costs for surcharges, current AFUDC and fixed charge rates, and emissions factors based on the capability of the existing LNB and OFA at the plant, typical SNCR removal rates, and minimum SCR emissions for bituminous coal.

In contrast, one commenter (Earthjustice) stated that SCR at Cholla is more cost-effective than EPA's calculations suggest, in that EPA overestimated the costs by (1) using an unjustifiably high 7 percent interest rate; (2) amortizing costs over a 20-year life of the SCR system, rather than a more realistic life of 30 years or more; and (3) overestimating the costs of the SCR catalyst, reagent, auxiliary power and property taxes and insurance. In addition, the commenter asserted that EPA baseline period understates NO<sub>x</sub> emissions reductions compared to the baseline period of 2001–2004.

According to the commenter, when the cost-effectiveness of SCR is calculated using more accurate costs, proper baselines and appropriate emission rates, the result is an even more cost-effective SCR investment that reduces NO<sub>x</sub> at a cost of \$1,901/ton at Unit 2, \$1,940/ton at Unit 3 and \$2,076/ton at Unit 4.

*Response:* Although we do not agree that our cost-effectiveness estimates

were incorrect, we have performed a supplemental analysis using portions of the updated cost estimates provided by APS in its comments. In this supplemental analysis, we have generally relied upon APS's estimates of capital costs and operating costs. While we do not find that these estimates were sufficiently supported with detailed site-specific information in all instances, we are using them as a conservative assumption (i.e., an assumption that would tend to overestimate rather underestimate the annualized cost of controls). As discussed in a previous response, we consider it appropriate to observe the broader cost methodology used in EPA's CCM, and have adjusted or eliminated certain cost items not allowed by the CCM. A line-by-line comparison of APS's cost estimate and our revisions can be found in the docket for this rulemaking action.<sup>156</sup> A summary of cost estimates based on this supplemental analysis is in Table 10, and includes the following:

- Inclusion of APS's updated cost estimates: We have adopted a 'hybrid' approach in which we have used APS's capital cost and O&M cost estimates, while excluding those cost items not allowed by CCM methodology. As discussed in a previous comment, we have included owner's costs up to the amount provided for "Engineering and Home Office Fees" as described by the CCM. We have excluded surcharge as

well as AFUDC, which is inconsistent with CCM methodology.

- Use of a 7 percent interest rate: We have retained the use of a 7 percent interest rate in calculating the capital recovery factor, and disagree with APS's assertion that a 13.4 percent interest rate is appropriate. For cost analyses related to government regulations, an appropriate "social" interest (discount) rate should be used. EPA calculated capital recoveries using 3 percent and 7 percent interest rates in determining cost-effectiveness for the Regulatory Impact Analysis (RIA) for the BART Guidelines.<sup>157 158</sup> We consider our use of an interest rate of 7 percent to calculate capital recovery to be a conservative approach.

- Use of original baseline period: As discussed elsewhere in our responses, we consider our use of a more recent baseline as consistent with BART Guidelines. However, in order to address commenter's concerns that we did not properly consider LNB and OFA as a potential control option and therefore precluded a BART determination of LNB and OFA, we have used a baseline period of 2001–2003, which corresponds to the period used in APS's original BART analysis. This represents a time period prior to the installation of LNB, during which the control technology in place on the Cholla units was only OFA.

TABLE 10—CHOLLA CONTROL COST ESTIMATES (PER APS COMMENTS, WITH EPA REVISIONS)

Control options	Capital cost (\$)	Annualized capital cost (\$/yr)	Annual O&M cost (\$/yr)	Total annual cost (\$/yr)
<b>Cholla 2:</b>				
LNB+OFA .....	\$4,482,254	\$423,093	\$120,000	\$543,093
SNCR w/LNB+OFA .....	16,617,408	1,568,566	1,254,500	2,823,066
SCR w/LNB+OFA .....	87,713,386	8,279,523	1,626,683	9,906,206
<b>Cholla 3:</b>				
LNB+OFA .....	3,848,807	363,300	120,000	483,300
SNCR w/LNB+OFA .....	19,238,125	1,815,943	1,254,500	3,070,443
SCR w/LNB+OFA .....	83,461,195	7,878,146	1,570,766	9,448,912
<b>Cholla 4:</b>				
LNB+OFA .....	5,334,618	503,550	170,000	673,550
SNCR w/LNB+OFA .....	24,885,052	2,348,973	1,737,393	4,086,366
SCR w/LNB+OFA .....	119,083,832	11,240,671	2,350,182	13,590,853

A summary of emission rates and emission reductions associated with each control option is in Table 11. As noted previously, these emission estimates are based on a 2001–2003 baseline period, during which the Cholla units operated only with OFA.

We note that while APS has provided emission estimates for this baseline period, the values provided, both in the original BART analysis and in submitted comments, appear to represent the highest 24-hour average value for modeling purposes. Since

control cost estimates are based on an annual average (\$/year), we have calculated annual emission rates for the OFA baseline using the annual average emission data reported to CAMD over this 2001–2003 baseline period. Comparing a baseline value on a 24-

<sup>156</sup> Docket ID No. EPA-R09-OAR-2012-0021.

<sup>157</sup> Regulatory Impact Analysis for the Final Clean Air Visibility Rule or the Guidelines for Best

Available Retrofit Technology (BART) Determinations Under the Regional Haze Regulations, EPA-0452/R-05-004 (June 2005).

<sup>158</sup> A 7 percent interest rate is recommended by Office of Management and Budget, Circular A-4, Regulatory Analysis, <http://www.whitehouse.gov/omb/circulars-a004-a-4/>.

hour average basis (as provided by APS) to a control option value on an annual average basis is not an “apples-to-

apples” comparison, as some portion of the emission reduction in such a comparison would be attributable to the

differences between moving from a 24-hour average to an annual average basis.

TABLE 11—CHOLLA EMISSION ESTIMATES

Control options	Emission factor (lb/MMBtu)	Heat rate (MMBtu/hr)	Annual capacity factor	Emission rate		Emissions removed (tpy)
				(lb/hr)	(tpy)	
<b>Cholla 2:</b>						
OFA (only) .....	0.326	3,022	0.91	985	3,927	.....
LNB+OFA .....	0.295	3,022	0.91	892	3,554	373
SNCR w/LNB+OFA .....	0.207	3,022	0.91	624	2,488	1,440
SCR w/LNB+OFA .....	0.050	3,022	0.91	151	602	3,325
<b>Cholla 3:</b>						
OFA (only) .....	0.304	3,480	0.86	1058	3,985	.....
LNB+OFA .....	0.254	3,480	0.86	885	3,335	650
SNCR w/LNB+OFA .....	0.178	3,480	0.86	620	2,334	1,651
SCR w/LNB+OFA .....	0.050	3,480	0.86	174	655	3,330
<b>Cholla 4:</b>						
OFA (only) .....	0.296	4,399	0.93	1302	5,304	.....
LNB+OFA .....	0.260	4,399	0.93	1144	4,661	643
SNCR w/LNB+OFA .....	0.182	4,399	0.93	801	3,263	2,042
SCR w/LNB+OFA .....	0.050	4,399	0.93	220	896	4,408

Cost-effectiveness values for each control technology are summarized in Table 12, based on the total annual costs

and annual emissions removed listed in the previous tables.

TABLE 12—CHOLLA CONTROL OPTION COST-EFFECTIVENESS

Control options	Total annual cost (\$/yr)	Emissions removed (tpy)	Cost-effectiveness (\$/ton)	
			Average	Increment
<b>Cholla 2:</b>				
OFA (only) .....	.....	.....	.....	.....
LNB+OFA .....	543,093	373	1,454	.....
SNCR w/LNB+OFA .....	2,823,066	1,440	1,961	2,138
SCR w/LNB+OFA .....	9,906,206	3,325	2,979	3,757
<b>Cholla 3:</b>				
OFA (only) .....	.....	.....	.....	.....
LNB+OFA .....	483,300	650	743	.....
SNCR w/LNB+OFA .....	3,070,443	1,651	1,860	2,586
SCR w/LNB+OFA .....	9,448,912	3,330	2,838	3,799
<b>Cholla 4:</b>				
OFA (only) .....	.....	.....	.....	.....
LNB+OFA .....	673,550	643	1,047	.....
SNCR w/LNB+OFA .....	4,086,366	2,042	2,001	2,441
SCR w/LNB+OFA .....	13,590,853	4,408	3,083	4,016

Even based on cost estimates revised to use APS’s capital and O&M cost estimates, we still consider the cost-effectiveness values of SCR, on an average (\$2,838 to \$3,083/ton) and incremental (\$3,757 to \$4,016/ton) basis, to not be cost-prohibitive. We consider these results supportive of our proposed determination that SCR with LNB and OFA is cost-effective. We note that while the LNB and OFA option is the least expensive (i.e., lowest annual cost) and is the most cost-effective of the control technologies (i.e., has the lowest \$/ton value), it is also the least effective control option. It removes substantially fewer emissions than either of the other

two control options, the SNCR- and SCR-based systems. As discussed in our proposed action, and in other responses in this document, we have not identified any energy or non-air quality impacts that warrant eliminating SCR from consideration for the Cholla units. Combined with the modeled visibility improvement associated with this control option, these cost estimates continue to support the selection of SCR with LNB and OFA as BART for NO<sub>x</sub> at the Cholla units.

d. Visibility Improvement

*Comment:* One commenter (NPS) agreed with EPA’s analysis of the

visibility impacts of the alternative NO<sub>x</sub> control options for Cholla Units 2, 3 and 4 at the various impacted Class I areas, as presented in EPA’s TSD. The commenter also indicated that its estimates of the two \$/deciview measures of cost-effectiveness were similar to those of EPA. Specifically, the commenter’s analysis yielded values of \$19.9 million for the “\$/max deciview” metric and \$3.7 million for “\$/cumulative deciview.”

*Response:* We acknowledge the comment.

*Comment:* One commenter (APS) hired a contractor to perform modeling with CALPUFF version 5.8 and the

updated version of 6.42 to measure the sensitivity of various emission control scenarios at Cholla Units 2, 3 and 4 including two different background ammonia concentrations. The contractor found that regardless of which model version or background ammonia value was used, the highest predicted visibility improvement of SNCR or SCR, compared to LNB and OFA, is lower than the threshold for human perceptibility of 1.0 deciview. Moreover, retrofitting SNCR or SCR at Cholla will not lead to any perceptible improvement in visibility at any of the 13 Class I areas within 300 km of the Cholla facility.

*Response:* EPA disagrees with the ammonia concentration and CALPUFF model version used by the commenter for reasons discussed above. Further, we do not agree that the consideration of visibility improvement must directly reflect human perception. The CAA and the RHR require, as part of each BART analysis, consideration of “the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology.”<sup>159</sup> 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. As EPA explained in the preamble to the BART Guidelines:

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.<sup>160</sup>

Thus, in our visibility improvement analysis, we have not considered perceptibility as a threshold criterion for considering improvements in visibility. Rather, we have considered visibility improvement in a holistic manner, taking into account all reasonably anticipated improvements in visibility expected to result at all Class I areas within 300 kilometers of each source. Improvements smaller than 0.5 dv may be warranted considering the number of Class I areas involved, and the fact that in the aggregate, small improvements from controls on multiple BART and other sources will contribute to visibility progress.<sup>161</sup>

In addition, EPA is not obligated to focus on incremental costs and benefits to the exclusion of absolute costs and

benefits. The BART Guidelines recommend consideration of both average and incremental cost-effectiveness,<sup>162</sup> but do not expressly require or recommend consideration of incremental visibility improvement. Rather, they provide for consideration of net visibility improvement (i.e., “the visibility improvement based on the modeled change in visibility impacts for the pre-control and post-control emission scenarios” as opposed to the change between different control scenarios).<sup>163</sup>

*Comment:* One commenter (APS) noted that Cholla Units 2 and 3 have separate flues but share a single stack, which EPA failed to recognize in its visibility modeling. The commenter also noted that EPA failed to use the appropriate Good Engineering Practice (GEP) stack height correction required by EPA’s own rules for modeling. Because these errors result in visibility impacts in opposite directions, the net effect is less than 5 percent, based on modeling that APS has conducted.

*Response:* If the commenter is correct that there were two errors that nearly cancel out, then this would appear to have little effect on EPA’s decision. The maximum area benefit of SCR was modeled by EPA to be 1.34 dv at Petrified Forest National Park, and 1.06 dv at Grand Canyon National Park; a 5 percent reduction in these would still result in substantial visibility benefits. EPA’s modeling was based on stack parameters provided by APS in a letter<sup>164</sup> that did not mention the merged stack, although it was mentioned in APS’s BART analysis<sup>165</sup> submitted to ADEQ. Stack parameters for Unit 4 provided in the commenter’s modeling do not match either of those documents (exit velocity of 77.1 feet/second versus 52 feet/second in APS’s letter). In addition, it is unclear how parameters for the merged stack in the commenter’s modeling were derived (except that the area of the merged stack used is equal to the sum of the areas of the individual stacks cited in the APS letter). Nevertheless EPA acknowledges that Units 2 and 3 should have been modeled together as a single stack. EPA conducted additional modeling to assess this affect, assuming the same total stack exit area and volume flow rate as for the individual stacks, and a volume-

weighted average of the individual stacks’ absolute exit temperatures. EPA found that impacts and improvements decreased by some 11 percent when merged stacks are used. The improvement from SCR at Petrified Forest remains over 1.0 dv, with continued substantial benefit at Grand Canyon. A merged stack for Units 2 and 3 was also assumed in additional modeling EPA performed to address H<sub>2</sub>SO<sub>4</sub> emissions for Cholla, as described below.

*EPA’s Guideline on Air Quality Models* (40 CFR part 51, Appendix W) at section 6.2.2 requires that facilities be modeled using a stack height consistent with GEP, rather than a higher actual stack height, in order to prohibit “stack height credit” from being used in developing emission limits.<sup>166</sup> By building very tall stacks instead of applying emission controls, facilities could avoid violating the NAAQS locally, but would contribute to higher levels of emissions regionally, and cause higher total pollutant levels downwind. In short, the requirement to use GEP stack height generally results in conservative modeling, thereby removing the incentive to build artificially tall stacks to evade controls. Choosing a stack height or taking credit for a stack height increase is not at issue in a BART determination. The visibility impacts and improvements shown in EPA’s BART modeling are closer to the actual values if actual stack heights are used. Insofar as GEP is relevant, using shorter GEP heights would tend to increase both pre- and post-control impacts, and to scale up the estimated visibility improvements. The overall effect would be to strengthen the case for EPA’s proposed controls.

*Comment:* Based on a report submitted with the comments, one commenter (Earthjustice) stated that had EPA’s BART analysis included lower emission rates and proper baselines, the visibility benefits of SCR at Cholla Units 2, 3 and 4 would be even greater than the 7.21 dv cumulative visibility benefit discussed in the proposed rule.

*Response:* As explained in the general discussion regarding selection of baseline periods above, we do not agree that we used an improper baseline. However, we agree that higher baselines and lower post-control emissions would show greater benefits than our modeling showed, and would further support our proposal for SCR.

<sup>162</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, Section IV.d.4.b.

<sup>163</sup> *Id.* Section IV.D.5.

<sup>164</sup> “Request for Information Relating to Cholla Power Plant”, letter from Sue Kidd, Director, Corporate Environmental Policy and Programs, to Francisco Doñez, EPA, (February 3, 2012).

<sup>165</sup> “BART Analysis for Cholla Unit 2,” Prepared for APS by CH2MHill (January 2008).

<sup>166</sup> Guideline on Air Quality Models 6.2.2.a. “The use of stack height credit in excess of Good Engineering Practice (GEP) stack height or credit resulting from any other dispersion technique is prohibited in the development of emission limitations by 40 CFR 51.118 and 40 CFR 51.164.”

<sup>159</sup> CAA section 169A(g)(2), 40 CFR 51.308(e)(1)(ii)(A).

<sup>160</sup> 70 FR 39129.

*Comment:* One commenter (APS) stated that EPA incorrectly applied H<sub>2</sub>SO<sub>4</sub> mitigation factors from an Electric Power Institute (EPRI) report<sup>167</sup> in reaching its conclusion that H<sub>2</sub>SO<sub>4</sub> production is not a problem with SCR at Cholla. The commenter stated that this factor is actually 90 percent rather than 99 percent in the report, but that this factor only applies to sub-bituminous coal because of the high calcium content in the ash of these coals. The commenter stated that testing at the Four Corners Power Plant (FCPP), which has similar coal ash calcium content to that at Cholla, indicates that 15 percent removal by the fabric filters would be likely. The commenter stated that the H<sub>2</sub>SO<sub>4</sub> emissions created by the SCR will exceed the NSR significance level, will result in costs associated with the H<sub>2</sub>SO<sub>4</sub> emissions, and will reduce the improvement in visibility anticipated by the retrofitting with SCR.

Another commenter (ADEQ) also stated that EPA discounts the impact of sulfuric acid mist that will be generated by SCR and overestimates the acid mist removal rate. The commenter indicated that testing at another facility shows H<sub>2</sub>SO<sub>4</sub> removal to be closer to 57 percent rather than EPA's assumed 99 percent removal. The commenter noted that if H<sub>2</sub>SO<sub>4</sub> emissions increase above the PSD significance threshold, a PSD permit and BACT analysis would be required. EPA's BART analysis fails to consider the costs associated with likely BACT requirements of low oxidation catalyst, fuel additives or sorbent injection with a polishing baghouse.

*Response:* EPA's decision to discount the increase of H<sub>2</sub>SO<sub>4</sub> caused by oxidation from the SCR catalyst was actually based on the 90 percent control figure; we erroneously wrote 99 percent (which applies to ammonia reduction from a wet scrubber). This figure is from the 0.10 percent penetration for baghouses, the only one available for baghouses in the EPRI report. It is not clear that results from the testing at FCPP referenced by the commenter may be applied directly to Cholla given the differences between the facilities. In addition, the full test results were not provided, so we cannot rely on the commenter's figures.

In any case, EPA does not believe that BART is the appropriate context for addressing this issue. Actual measurements of baseline sulfuric acid emissions have not yet been determined at Cholla. Moreover, the calculation of

projected sulfuric acid emissions after installation and operation of SCR using the EPRI methodology is dependent on future decisions made by the facility on the type of SCR catalyst and number of layers used, as well as numerous assumptions about loss to downstream components (i.e., air preheaters and baghouses), the true values of which are currently not yet defined or known for Cholla. An increase in sulfuric acid emissions from the installation of SCR may trigger major modification PSD permit requirements at a low threshold of seven tons per year.<sup>168</sup>

Preconstruction permitting review may also be triggered from significant emissions increases of PM<sub>2.5</sub> from SCR installation at Cholla. If one of these pollutants triggers PSD, the permitting authority must provide an Additional Impact Analysis under the PSD program. The PSD program also requires the permitting authority to determine BACT for pollutants that triggered PSD. For these reasons, Region 9 has determined that for Cholla, emission limits and monitoring requirements for sulfuric acid are more appropriately reviewed in the preconstruction permitting process.

Nevertheless, EPA conducted additional CALPUFF modeling to assess the visibility effect of increased sulfuric acid due to the SCR catalyst. One scenario used the existing modeling for Cholla, but added in SCR sulfate calculated by the method in the EPRI document. Since the existing modeling used sulfate calculated using PM speciation spreadsheets provided by the National Park Service, this scenario mixes two calculation methods and may not be reliable. The sulfate in the existing modeling is so large that the additional SCR sulfate from the EPRI method increases total sulfate by only about 5 percent. Visibility benefits only decreased by about three percent at Petrified Forest, and by an even smaller fraction at other areas. To assess the SCR sulfate effect in a more consistent manner, EPA calculated sulfate using the EPRI method throughout the base case for SCNR, and for SCR. All cases used a merged stack for Units 2 and 3 and consistent speciation for all units (formerly the speciation for Unit 2 differed from the others). The sulfate emissions from the EPRI method are much lower than from the NPS spreadsheets, but SCR increases that amount by a factor of six (even with the increase the total is still far lower than used in the original modeling). The visibility impacts for all cases are substantially lower than in the former

modeling; the maximum area base case impact is 3.51 dv at Petrified Forest compared to 4.53 dv previously. But for some areas the impacts from controls declined more than the impacts from the base case, leading to the somewhat surprising result that the improvement due to controls actually increased relative to the original modeling. The maximum area benefit of SCR in the new modeling is 1.55 dv compared to 1.34 dv in the original. The cumulative area benefit decreased very slightly to 7.19 dv compared to 7.21 in the original. Based on this improved estimate of sulfate emission based on the EPRI method, the case for SCR appears to be strengthened, since the maximum visibility improvement is larger than originally estimated.

#### e. Other Comments

*Comment:* One commenter (NPS) agreed with EPA's conclusions on Cholla that the visibility improvement associated with the most stringent option (SCR with LNB and OFA) is substantial; that SCR with LNB and OFA is cost-effective on an average basis as well as on an incremental basis when compared to the next most stringent option (SNCR with LNB and OFA); and that NO<sub>x</sub> BART for Cholla Units 2, 3 and 4 is SCR with LNB and OFA, with an associated emission limit for NO<sub>x</sub> on each of the units of 0.050 lb/MMBtu, based on a rolling 30-boiler-operating-day average.

*Response:* We acknowledge the comment.

*Comment:* One commenter (APS) estimated that EPA's proposed controls on Cholla Units 2 and 3 will cost \$248 million and \$103 million, respectively, and increase the costs of electricity from those units by over 25 percent. The commenter stated that given the current market price for natural gas, the proposed BART requirements, expected coal ash regulations, and potential future carbon legislation could jeopardize the long-term economic viability of the entire plant. The commenter also stated that EPA did not consider the impacts of requiring SCR on ratepayers' monthly bills, which would be about 2 percent to accommodate SCR alone. In addition, the commenter is concerned about potential impacts on the transmission grid in Arizona, the local economy due to lost jobs, and a reduced diversity in APS's fuel mix if Cholla was to close.

*Response:* It is not EPA's intention to endanger the economic viability of Cholla or to place an undue burden on APS's customers. Neither the CAA nor the RHR requires states or EPA to consider the affordability of controls,

<sup>167</sup> Estimating Total Sulfuric Acid Emissions from Stationary Power Plants, Version 2010a, 1020636, Technical Update, Electric Power Research Institute, April 2010).

<sup>168</sup> See 40 CFR 52.21(b)(23)(i).



ratepayer impacts or 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.”<sup>169</sup>

APS’s comments appear to be based in part on a misunderstanding 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 this factor is limited to non-air quality environmental impacts.<sup>170</sup> 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.”<sup>171</sup>

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:

\* \* \* 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.<sup>172</sup>

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.<sup>173</sup>

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, APS has provided no evidence to support its 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, APS’s assertions regarding plant shutdown, rate increases and job losses are speculative, and we cannot consider them as part of our BART determination.

*Comment:* One commenter (PacifiCorp) stated that because the regional haze actions in Arizona, Wyoming, Colorado and elsewhere will have an impact of \$100 million or more on the company and its customers, EPA must conduct the regulatory analyses required by the Unfunded Mandates Reform Act (UMRA) and Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use (Executive Order 13211) before reaching conclusions regarding BART controls or imposing a regional haze FIP.

*Response:* The commenter is combining separate regulatory actions. The commenter is not correct in aggregating the potential private sector mandate of separate rules to evaluate whether UMRA applies. UMRA defines the term ‘Federal private sector mandate’ to mean any provision in regulation that would impose an enforceable duty upon the private sector. Under UMRA, the term “regulation” or “rule” means any rule for which the agency publishes a general notice of proposed rulemaking. The rule being finalized today is limited to addressing the obligations of three facilities in Arizona and does not include other regional haze actions occurring in separate rulemakings, such as for Wyoming and Colorado.

Under section 202 of UMRA, before promulgating any final rule for which a general notice of proposed rulemaking was published, EPA must prepare a written statement, including a cost-benefit analysis, if that rule includes any “Federal mandates” that may result in expenditures to State, local, and Tribal governments, in the aggregate, or to the private sector, of \$100 million or more (adjusted for inflation) in any 1

year. Under Title II of UMRA, EPA has determined that this rule does not contain a Federal mandate that may result in expenditures that exceed the inflation-adjusted UMRA threshold of \$100 million (in 1996 dollars) by State, local, or Tribal governments or the private sector in any one year. Even using the higher cost estimates in our supplemental analysis for the FIP we are finalizing today, we estimate that the total annual costs in the aggregate will not exceed \$65 million.<sup>174</sup> Finally, this rule is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant regulatory action under Executive Order 12866.

*Comment:* One commenter (APS) disagreed with EPA’s conclusion that the use of anhydrous ammonia does not pose significant additional safety concerns compared to aqueous ammonia and urea. The commenter contends that while anhydrous ammonia would be transported by rail, safety concerns are not eliminated because the severity of damage in an accident can be much greater, if less frequent than truck accidents, and constitutes a much higher risk after delivery. Due to the hazards of moving and storing anhydrous ammonia, the Department of Homeland Security and EPA have additional requirements for anhydrous ammonia that result in additional costs to use it. Urea costs more than anhydrous ammonia, but it is safer and less expensive to use and store. Due to these factors the commenter stated that SNCR and SCR costs should include the use of urea rather than anhydrous ammonia.

*Response:* The BART analyses submitted by APS indicate that the annualized cost of urea at each of the Cholla units would be less than the annualized cost of anhydrous ammonia.<sup>175</sup> In addition, the cost estimates provided by APS in comments are based on the use of urea as a reagent. Accordingly, we have used the cost for urea in our supplemental cost analysis.

*Comment:* One commenter (APS) noted that Cholla has a long history of installing pollution control equipment,

<sup>174</sup> Using total annual costs from our supplemental analysis, annual aggregate cost equals \$64,378,422. This amount consists of: \$9,906,206 for Cholla Unit 2, \$9,448,912 for Cholla Unit 3, and \$13,590,853 for Cholla Unit 4 (See Table 10 of this NFRM); \$12,103,941 for Coronado Unit 1 and \$235,982 for Coronado Unit 2 (See Tables 15 and 13 of this NFRM); and \$9,546,264 for each of Apache Units 2 and 3 (See Table 5 of this NFRM).

<sup>175</sup> See BART Analysis for Cholla Unit 2, Appendix A, Economic Analysis, Input Calculations; BART Analysis for Cholla Unit 3, Appendix A, Economic Analysis, Input Calculations; BART Analysis for Cholla Unit 4, Appendix A, Economic Analysis, Input Calculations.

<sup>169</sup> CAA section 169A(g)(2), 42 U.S.C. 7491(g)(2); 40 CFR 51.308(e)(1)(ii)(A).

<sup>170</sup> *Id.*

<sup>171</sup> BART Guidelines section IV.D.4.h

<sup>172</sup> *Id.* section IV.E.2.

<sup>173</sup> *Id.* section IV.E.3.

has participated in a voluntary emissions reduction project, and has spent over \$473 million to reduce emissions. While Unit 1 at Cholla is not BART-eligible, it is equipped with a wet-tray absorber to control SO<sub>2</sub>, a fabric filter to control particulates, and LNB with OFA to control NO<sub>x</sub> emissions. Unit 2 is BART-eligible and has a mechanical dust collector for particulate control, a wet flooded-disk venturi scrubber and absorbers to control SO<sub>2</sub>, additional particulate controls, and LNB with OFA to control NO<sub>x</sub> emissions. Units 3 and 4 have wet open-spray FGD absorber to control SO<sub>2</sub>, fabric filters to control particulates, and LNB with OFA to control NO<sub>x</sub> emissions. Unit 2 is scheduled to upgrade its SO<sub>2</sub> and particulate controls to be identical to Units 3 and 4 by January 1, 2016.

*Response:* We appreciate that APS has installed various controls on the Cholla units over the last several years and we have taken these existing controls into account as part of our BART analysis for NO<sub>x</sub>.<sup>176</sup> However, we note that, even with all of these new controls, emissions from Cholla still cause visibility impairment at nine Class I areas and contribute to impairment at an additional two areas.<sup>177</sup>

*Comment:* One commenter (APS) requested that EPA allow the flexibility of averaging NO<sub>x</sub> emissions across all the BART-eligible units at the plant. The commenter stated that allowing for this flexibility would make no difference from a visibility improvement perspective.

*Response:* We agree with the commenter, and have finalized a single NO<sub>x</sub> emission limit across Cholla Units 2, 3 and 4.

### 3. Comments on Coronado Units 1 and 2

#### a. Selection of Baseline Period

*Comment:* Two commenters (ADEQ and SRP) stated that EPA's selected baseline emissions period inappropriately eliminated consideration of LNB with OFA as a viable BART control strategy. SRP asserted that EPA's decision to include LNB with OFA in its baseline NO<sub>x</sub> emissions estimate cannot, consistent with the BART rules, foreclose consideration of those controls as BART

for Coronado, and that EPA's failure to consider these controls in its BART assessment makes the proposed rule invalid. The commenter added that emission reductions already achieved at the facility using LNB with OFA should not be ignored in EPA's analysis simply because EPA delayed review of ADEQ's SIP until 2012. The commenter concluded that EPA should give deference to the baseline emissions period selected by the State in its SIP analysis and fully consider LNB with OFA as an appropriate basis for BART emission limitations for Coronado.

Another commenter (NPS) preferred the use of a baseline period before the installation of LNB with OFA instead of the post-installation period (May 16, 2009 to December 31, 2010) used by EPA. For Unit 2, the commenter stated that the federally enforceable limit of 0.080 lb/MMBtu is a realistic depiction of future emissions even though the required SCR system has not yet been installed.

*Response:* As explained in the general discussion regarding selection of baseline periods above, we disagree that our use of updated baseline periods for BART determinations is inappropriate or inconsistent with the CAA or the RHR. Moreover, updating the baseline did not eliminate LNB with OFA from consideration as BART for Coronado Unit 1, since existing controls can constitute BART, if additional controls are not warranted based on the five-factor analysis. For example, EPA recently approved a determination by Colorado that existing LNB at Comanche Units 1 and 2 constituted BART where "the State determined that the added expense of achieving lower limits through different controls was not reasonable based on the high cost-effectiveness [\$9,900/ton] coupled with the low visibility improvement (under 0.2 dv) afforded."<sup>178</sup> In the case of Coronado, by contrast, the cost-effectiveness of post combustion controls is reasonable and the expected visibility improvements are substantial, as explained below. Nonetheless, in order to address the commenter's concerns that we did not properly consider LNB with OFA as a potential control option, and therefore precluded a BART determination of LNB with OFA, we have used a baseline period of 2001–2003, which corresponds to the period used in SRP's original BART analysis. Our supplemental cost

analysis for Coronado is summarized in Table 15.<sup>179</sup>

#### b. Control Efficiencies

*Comment:* One commenter (SRP) stated that the SNCR NO<sub>x</sub> emission rate evaluated by EPA is incorrect. The commenter cited an SNCR conceptual design estimate prepared by S&L (attached to the submission) asserting that, based on an initial review of SNCR implementation at Coronado, the expected NO<sub>x</sub> reductions would be 25 percent and notes that additional studies would be needed to guarantee this performance. According to the commenter, this estimate also was verified by an independent vendor, FuelTech, whose assessment was also attached to the submission.

The commenter (SRP) assumed that EPA evaluated an emission limit that is based on a higher reduction efficiency (i.e., 30 percent) applied to a starting NO<sub>x</sub> emission limit of 0.30 lb/MMBtu. According to the commenter, given Coronado's current NO<sub>x</sub> emissions limit of 0.320 lb/MMBtu following the installation of LNB with OFA on each of the units and an SNCR control efficiency of 25 percent, the appropriate NO<sub>x</sub> emission rate to use in the BART analysis would be 0.24 lb/MMBtu, rather than EPA's assumed value of 0.21 lb/MMBtu. The commenter contended that this NO<sub>x</sub> emission rate (i.e., 0.24 lb/MMBtu) represents a level that can likely be achieved on a consistent basis based on input from SRP's vendors who have specific SNCR implementation experience.

*Response:* We partially agree with this comment. Coronado Unit 1 currently operates with a federally-enforceable NO<sub>x</sub> emission limit of 0.320 lb/MMBtu.<sup>180</sup> A review of recent emission data in CAMD indicates NO<sub>x</sub> emission levels below this limit. As noted in our response to SRP's comments regarding SCR, we agree that when using an annual average design emission rate to establish a rolling 30-day limit that will apply during periods of startup, shutdown, and malfunction events, it is appropriate to include some type of measure that provides a compliance margin.

In submitted comments, SRP provided a conceptual design estimate for SNCR which was based upon 25 percent control efficiency (incremental from LNB) and a resulting emission rate of 0.24 lb/MMBtu. While this control efficiency is less than the 30 percent

<sup>176</sup> 77 FR 42854, July 20, 2012 (noting that "[t]he baseline emissions used by EPA reflect current fuels and control technologies in place at the facilities, as well as regulatory requirements the facilities will be required to meet independent of EPA's BART determination.").

<sup>177</sup> See 77 FR 42861, July 20, 2012, Table 20 (showing baseline impacts from Cholla of over 1 dv at nine Class I areas, and impacts of over 0.5 dv at eleven areas).

<sup>178</sup> 77 FR 18052, 18066 (March 15, 2012) (Proposed Rule); pre-publication version of Final Rule, signed September 10, 2012, available at: <http://www.epa.gov/region8/air/FinalActionOnColoradoRegionalHazePlanSep2012.pdf>.

<sup>179</sup> A spreadsheet titled "Supplemental Cost Analysis 2012–11–15.xls" is in the docket.

<sup>180</sup> See Coronado Title V Permit, Attachment B, section II.E.1.a.ii.

control efficiency used by our contractor, we consider it to be a reasonable estimate based upon the vendor quotes provided by SRP.<sup>181</sup> When using a control efficiency of 25 percent and our baseline period of LNB performance for Coronado Unit 1, we estimate an annual average SNCR emission rate of 0.22 lb/MMBtu.

For the purposes of our cost calculations and visibility modeling, however, we have retained the use of our original SNCR emission rate (0.21 lb/MMBtu). A less stringent SNCR emission rate, by itself, would primarily make the next most stringent control option, SCR, appear to remove a greater amount of emissions. This in turn would make the SCR control option appear more incrementally cost-effective by removing a greater amount of emissions, relative to SNCR, for the same cost. As discussed in our proposal and in response to comments, we already consider SCR to be cost-effective. It is not determinative to our decision to find that SCR is “even more” incrementally cost-effective.

In the context of establishing a BART emission limit consistent with the use of SNCR technology, however, we would use the annual average SNCR emission rate of 0.22 lb/MMBtu as our basis, rather than our original estimate based on 30 percent SNCR control efficiency. As noted in a separate response, when using an annual average design emission rate to establish a rolling 30-day limit that would apply during periods of startup, shutdown, and malfunction, we consider it appropriate to provide some type of measure that provides a compliance margin for such events. A 0.24 lb/MMBtu emission limit, as requested by SRP, established on a rolling 30-day average represents about a 10 percent increase from the 0.22 lb/MMBtu annual average emission rate. We would consider this magnitude of upward revision appropriate to accommodate startup, shutdown, and malfunction events as well as the unit cycling nature of Coronado Unit 1. As a result, we would consider the BART emission limit corresponding to the SNCR with LNB and OFA option to be 0.24 lb/MMBtu.

*Comment:* One commenter (SRP) stated that EPA improperly ignored the Coronado consent decree in its selection of the proposed BART controls for NO<sub>x</sub>. The commenter noted that ADEQ determined that NO<sub>x</sub> BART for Coronado Units 1 and 2 is LNB with

OFA and a corresponding emission limit of 0.320 lb/MMBtu, making Units 1 and 2 currently subject to a 0.320 lb/MMBtu NO<sub>x</sub> limit. The commenter added that Unit 2 will be subject to a 0.080 lb/MMBtu NO<sub>x</sub> emission limit as soon as the SCR for that unit is installed and operational (i.e., by June 1, 2014), pursuant to the consent decree, a limit that is significantly more stringent than what the state determined to be BART for Coronado.

The commenter (SRP) asserted that the consent decree controls are better than BART. The commenter pointed out that once SCR is installed on Unit 2, the facility will be subject to a plant-wide emission limit of 7,300 tons of NO<sub>x</sub> per year under the consent decree which, according to the commenter, translates to an effective emission rate of 0.20 lb/MMBtu for Coronado as a whole, and is more stringent than the state’s NO<sub>x</sub> BART determination and EPA’s presumptive NO<sub>x</sub> limits.

The commenter (SRP) also contended that EPA’s BART rules support the conclusion that the existing and currently planned controls are better than NO<sub>x</sub> BART because those controls and emission rates were agreed to by SRP and EPA to resolve allegations of violations of certain requirements of the PSD program for both units. According to the commenter, those limits are intended to reflect compliance with the PSD program’s BART requirements. The commenter noted that BACT, by definition, reflects the maximum degree of control for new facilities or existing facilities undergoing a major modification while BART is to apply to unmodified existing sources. So BACT would be expected to be more stringent, and certainly not less stringent, than BART. The commenter quoted a recent EPA statement about the Four Corners Power Plant indicating that BART need not be equivalent to BACT (citing 77 FR 51620, 51636, August 24, 2012).

The commenter (SRP) asserted that the BART rules reflect this understanding, providing that PSD settlement agreements generally satisfy BART requirements (citing 70 FR 39164). According to the commenter, EPA recently recognized this principle in its final regional haze rule for North Dakota in which EPA concluded that it was appropriate to rely on North Dakota’s BACT determination for the two units at the Milton R. Young Station (0.36 lb/MMBtu and 0.35 lb/MMBtu) to satisfy BART because emissions control technology had not changed appreciably since that BACT determination (citing 77 FR 20897, April 6, 2012). The commenter stated that a similar situation is present in the case of

Coronado, and the recent PSD consent decree should, pursuant to the BART Guidelines, be deemed to satisfy BART.

*Response:* We do not agree that we improperly ignored the existing consent decree in our proposed BART determination for NO<sub>x</sub> at Coronado, since we specifically took the consent decree into account throughout our NO<sub>x</sub> BART analysis.<sup>182</sup> We also do not agree that the Coronado consent decree represents BACT or BART for NO<sub>x</sub>. While the consent decree concerned alleged violations of the PSD provisions of the CAA, it does not indicate that its provisions represent either BACT or BART. Rather, it specifically provides that:

Compliance with the terms of this Consent Decree does not guarantee compliance with all applicable federal, state, or local laws or regulations. The emission rates and removal efficiencies set forth herein do not relieve SRP from any obligation to comply with other state and federal requirements under the Clean Air Act \* \* \* 183

While the BART Guidelines provide that NSR/PSD settlement agreements may represent BART in some instances, they do not establish a presumption that such settlements represent BART, nor do they indicate that a BART analysis is unnecessary where such a settlement exists.<sup>184</sup> In Coronado’s case, we do not agree that the consent decree represents BART for NO<sub>x</sub> for either unit or for the facility as a whole. Nonetheless, we are taking the consent decree into account in our BART determination for NO<sub>x</sub> at Coronado, as described below.

*Comment:* In arguing against the achievability of EPA’s proposed limit, two commenters (AUG and SRP) cited a report prepared by RMB Consulting & Research, Inc. (RMB) for the San Juan Generating Station in New Mexico, which reportedly states that the 0.05 lb/MMBtu limit imposed on that facility does not represent a consistently achievable level of emissions for the units at the facility. In addition, SRP contracted with RMB and Sargent and Lundy (S&L) to review the ability of the Coronado units to achieve the 0.050 lb/MMBtu emission limit proposed by EPA

<sup>182</sup> See 77 FR 42849–42850, July 20, 2012, (summarizing terms of consent decree), 42861–42862 (describing consideration of consent decree requirements in baseline for Coronado analyses), 42863 (noting potential effect of consent decree activities on cost analysis), 42864 (proposing emission limit of 0.080 lb/MMBtu and compliance deadline of June 1, 2014 at Coronado Unit 2, consistent with the emission limit in the consent decree).

<sup>183</sup> Consent Decree in *United States v. Salt River Project*, CV 08–1479–PHX–JAT (entered December 19, 2008).

<sup>184</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.C.

<sup>181</sup> Although the report cites lower NO<sub>x</sub> concentrations, due to the lower inlet NO<sub>x</sub> emission rate, removal efficiency is also reduced making it more difficult to reduce NO<sub>x</sub> emissions.

using SCR control technology. Their reports were submitted as attachments to the commenter's submission. According to the commenter, both consultants concluded that a NO<sub>x</sub> BART limit of 0.050 lb/MMBtu is not achievable at Coronado on a 30-day rolling average that includes periods of startup, shutdown, and malfunction. The commenter made the following arguments against the achievability of a limit of 0.050 lb/MMBtu relying first on RMB's analysis and then on S&L's analysis.

RMB's analysis stated that EPA did not adequately consider the impact of startup and shutdown emissions or the ability to measure such emissions in its BART determination. RMB examined operating data from 2001 to 2011 in order to identify the number of startup events (both "cold" and "warm" starts) and shutdown events associated with each unit. RMB's analysis shows that the average number of startup/shutdown events for Coronado Units 1 and 2 is one per month (each), and that the maximum number of startup/shutdown events is five per month (Coronado Unit 1) and six per month (Coronado Unit 2). RMB then developed a computer model to estimate the 30-day rolling average the Coronado units could achieve based upon the emissions profile of these startup/shutdown events, the maximum number of startup/shutdown events, and an assumption of a NO<sub>x</sub> emission rate of 0.04 lb/MMBtu over the life of the catalyst. RMB's analysis indicates that the maximum 30-day average the units could achieve is well above 0.050 lb/MMBtu.

S&L's analysis focused on the ability of Coronado Unit 2, which has been designed to achieve a 0.08 lb/MMBtu emission rate, to achieve a lower 0.05 lb/MMBtu emission rate. S&L's analysis considered multiple design changes and examined their potential impact on reducing the design emission rate, as well as the costs and design/construction time associated with these options. S&L concluded that, at a minimum, SRP would be required to install a low load temperature control system designed to increase flue gas temperatures at the SCR inlet during periods of low load cycling to achieve any additional reduction in average NO<sub>x</sub> emissions. S&L's analysis concluded that even with a low-load temperature control system, Unit 2 could not consistently achieve the proposed limit when periods of low-load cycling, startup and shutdown are taken into account, and could only achieve within the range of 0.053 to 0.072 lb/MMBtu.

Finally, both AUG and SRP noted that the BART Guidelines authorize application of BART emission limits on a plant-wide basis, rather than a unit-by-unit basis, and that use of plant-wide limits would not affect the expected visibility benefits of controls. Therefore, they requested that EPA allow for plant-wide averaging at Coronado.

*Response:* We partially agree with this comment. As noted by the commenters, the BART Guidelines recommend that states "consider allowing sources to 'average' emissions across any set of BART-eligible emission units within a fence line \* \* \*" <sup>185</sup> Given that such a "bubbling" approach would not diminish the visibility benefits of controls, we have decided to finalize a single plant-wide limit across the two Coronado units.

In analyzing what emission limit would represent BART for NO<sub>x</sub> on a plant-wide basis, we have taken a number of factors into consideration. In our proposal, we used an annual average design value for SCR of 0.050 lb/MMBtu at Coronado Unit 1 and proposed an emission limit for this same value on a rolling 30-day average. At Coronado Unit 2, we proposed an emission limit of 0.080 lb/MMBtu, but solicited comment on whether a more stringent limit would be feasible and cost-effective for Unit 2. SRP submitted comments stating that an emission rate of 0.05 lb/MMBtu was not achievable by either unit, due to the startup/shutdown operating profile of the Coronado units. As noted in other responses, BART limits apply at all times including periods of startup, shutdown, and malfunction. As a result, we agree with commenters that when establishing a rolling 30-day BART emission limit that is based upon an annual average design value, it is appropriate to provide a compliance margin for periods of startup and shutdown. Therefore, we have taken into consideration the startup/shutdown operating profile of the Coronado units.

In submitted comments, SRP included reports prepared by S&L and RMB Consulting summarizing an analysis performed to determine the rolling 30-day emission rates the units could achieve when accounting for startup and shutdown events, as well as the load cycling operating profile of the plant. <sup>186</sup> The analyses in the two reports were based on slightly different assumptions. RMB's analysis, which

<sup>185</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section V.

<sup>186</sup> In addition to the final reports, SRP provided certain supporting spreadsheets upon request. We have placed these spreadsheets in the docket.

examined both Coronado Units 1 and 2, included the following assumptions:

- Five to six startups (1 cold/remainder warm) per month (which is the maximum observed based on 2001 to 2011 historical performance);
- Startup emissions based on the maximum value observed during that startup period;
- Non-startup periods of operation based on historical load operation, which consists of a mixture of low load and high-load cycling operation;
- Inclusion of a low load temperature control system; and
- Maintaining the catalyst guarantee of 0.04 lb/MMBtu during full load, steady-state operations over the life of the catalyst.

The analysis performed by S&L examined only Coronado Unit 2, and was one element of S&L's broader analysis examining the ability of Coronado Unit 2 to meet a limit more stringent than the 0.080 lb/MMBtu limit in the consent decree. The analysis performed by S&L was based on the following assumptions:

- One to three startup events per month;
- Non-startup periods of operation based entirely on low load cycling scenario (40–100 percent gross load cycling);
- Inclusion of a low load temperature control system; <sup>187</sup> and
- Maintaining the catalyst guarantee of 0.04 lb/MMBtu during full load, steady-state operations over the life of the catalyst.

The results of both of these analyses indicates that the Coronado units could achieve a rolling 30-day emission rate in the range of 0.053 to 0.072 lb/MMBtu based on all the assumptions listed above. We acknowledge that different assumptions, such as using fewer startups per month, or using a load operating profile during non-startup periods that corresponded to a greater fraction of high-load cycling operations, could produce a lower range of emission values. However, we find that the assumptions used in both analyses are reasonable based on the historic performance data supplied by SRP and its consultants. Therefore, we have concluded that a 0.050 lb/MMBtu emission rate is not achievable on a rolling 30-day average at either of the Coronado units. <sup>188</sup> Nonetheless, we note

<sup>187</sup> S&L's analysis also included emission modeling of Coronado Unit 2 without the low load temperature control system, which, as discussed in further detail below, is not part of the current SCR design.

<sup>188</sup> Nonetheless, we note that the emission modeling results (particularly those produced by

that the results of these analyses (particularly those produced by the RMB report) indicate that Coronado Unit 1 could meet a 0.050 lb/MMBtu limit on an annual average basis. As a result, we conclude that 0.050 lb/MMBtu is appropriate as an annual average design value, but not as 30-day rolling average emission limit at the Coronado units.

With respect to Coronado Unit 2, we have also taken into account the fact that Unit 2 is already subject to a consent decree limit of 0.080 lb/MMBtu with a compliance deadline of June 1, 2014. We consider the SCR system that SRP has designed to meet this limit to constitute “pollution control equipment in use at the source.” Therefore, consistent with the BART Guidelines, we have considered various ways in which the performance of the current SCR design for Unit 2 could be improved.<sup>189</sup> In its analysis examining

whether the SCR system for Unit 2 could achieve an emission rate more stringent than the 0.080 lb/MMBtu limit in the consent decree for which the SCR was designed, S&L examined a number of different potential measures. One of these measures was the installation of a low load temperature control system, which the current SCR design for Unit 2 does not include.

As described in the S&L report, periods of low load operation generally consist of operation between loads of 138 MW to 270 MW (operation above 270 MW can be considered “high” load). Broadly speaking, the temperature in the SCR system will fall below 599 degrees F during these periods of low load operation, which is the minimum temperature required for effective NO<sub>x</sub> control. A low load temperature control system increases the temperature at the SCR inlet in order to maintain 599 degrees F, allowing operation of the SCR

system during periods of low load.<sup>190</sup> Without this control system, the Coronado Unit 2 SCR system will not operate during periods of low load. Under EPA’s visibility regulations, “BART means an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction \* \* \*<sup>191</sup> While SCR represents the most stringent technology for NO<sub>x</sub> control, an SCR system that is designed not to function during a period of operation that represents a substantial fraction of the unit’s overall operating profile cannot be considered continuous. In examining the installation of a low load temperature control system as an upgrade option to Coronado Unit 2, we note that the S&L report estimated the costs for the low load temperature control system as shown in Table 13.

TABLE 13—S&L’S COST ESTIMATES FOR LOW LOAD TEMPERATURE CONTROL SYSTEM

Measure	Capital cost <sup>1</sup> (\$)	Annualized capital cost <sup>2</sup> (\$/yr)	Annual O&M costs (\$/yr)	Total annual costs (\$/yr)
Low load temperature control system .....	\$2,500,000	\$235,982	.....	\$235,982

<sup>1</sup> Represents the mid-range value of S&L’s estimate of capital costs.

<sup>2</sup> Capital costs annualized using a 7 percent interest rate over a 20 year lifetime.

Although it is not clear what annual average emission rate can be achieved by Coronado Unit 2 with installation of a low load temperature control system, the upper range of rolling 30-day emission rates modeled for Coronado Unit 2 is 0.072 lb/MMBtu. We consider this a conservative estimate (i.e., a high estimate in this case, as the annual average number will certainly be lower than the 30-day value), and have used this emission rate with the cost information contained in the S&L report, to calculate the cost-effectiveness value shown in Table 14. Installation of a low load temperature controller results in a cost-effectiveness of \$1,900/ton, which is in a range that we consider cost-effective.

In addition, SRP stated that it considered the incremental visibility benefit of an emission limit more stringent than 0.080 lb/MMBtu to be insignificant. In relation to installation of a low load temperature controller, we

disagree. Specifically, SRP bases this comment on the visibility improvement associated with a 0.080 lb/MMBtu limit and a lower value such as 0.07 or 0.05. Visibility modeling, however, is based on the highest emission rate observed on a 24-hour average, not on a 30-day or annual average basis. Since Coronado Unit 2 is not equipped with a low load temperature controller and therefore cannot operate the SCR during periods of low load operation, emissions from Coronado Unit 2 during these periods correspond to operation of LNB with OFA. A review of Coronado Unit 2’s operating history since June 2011, which is approximately when LNB was installed, indicates several instances in which it operates at low load for periods that can exceed a 24-hour calendar day. Based on the Acid Rain Program data provided by SRP and included in CAMD, the longest such period of continuous low load operation extended from May 20 to May 22, 2012.<sup>192</sup> As a

result, although equipped with an SCR system, the maximum 24-hour average emission rate for Coronado is more accurately represented by an emission rate corresponding to LNB and OFA, and not SCR.

We consider this distinction crucial. In our base case modeling runs, the maximum 24-hour average emission rate modeled for Coronado Unit 2 was represented by a NO<sub>x</sub> emission rate of 0.08 lb/MMBtu, corresponding to the emission limit for SCR in the consent decree. However, the highest 24-hour average emission rate is more accurately represented by a 24-hour period of low load operation, where the SCR system would not be operating. Based on Acid Rain Program data reported to CAMD, this corresponds to a NO<sub>x</sub> emission rate of 0.23 lb/MMBtu and 13,684 lb/day.<sup>193</sup> By allowing the SCR system to run during all loading periods, the installation of a low load temperature control system would result in a

the RMB report) indicate that Coronado Unit 1 could meet a 0.050 lb/MMBtu limit on an annual average basis. As a result, we conclude that the use of a 0.050 lb/MMBtu as annual average design value in our proposal was appropriate.

<sup>189</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.3.

<sup>190</sup> We note that this is not an unusual control system, and is commonly included in typical SCR

systems. If SCR were to be installed on Coronado 1, for example, the information SRP has provided indicates that such a system would include a low load temperature control system.

<sup>191</sup> 40 CFR 51.301.

<sup>192</sup> We have identified these dates in both sets of data, per “SRP 2 NO<sub>x</sub> analysis (EPA edits).xls” and “Coronado 2 2011–12Q3 NO<sub>x</sub> Emission Data (daily).xls”.

<sup>193</sup> This represents the emission rate on April 1, 2012, which is the highest emitting day that consisted of 24 consecutive hours of low-load operation, as identified in “SRP 2 NO<sub>x</sub> analysis (EPA edits).xls” and “Coronado 2 2011–12Q3 NO<sub>x</sub> Emission Data (daily).xls”.

decrease in the maximum 24-hour average emission rate from 0.21 lb/MMBtu to 0.080 lb/MMBtu. The visibility improvement associated with this emission decrease at the single most

affected Class I area is 0.52 (Gila Wilderness). Cumulatively, across all of the affected Class I areas, this results in visibility improvement of 2.64 deciviews. We consider this degree of

visibility improvement substantial, especially when taking into consideration the cost-effectiveness of installing a low load temperature control system.

TABLE 14—CORONADO UNIT 2: COST-EFFECTIVENESS

	Emission factor (lb/MMBtu)	Emission rate <sup>1</sup>		Removed (tpy)	Annual cost (\$/yr)	Cost-effectiveness (\$/ton)
		(lb/hr)	(tpy)			
SCR+LNB+OFA (no low load temp ctrl sys) .....	0.080	319	1,242	.....	.....	.....
SCR+LNB+OFA (with low load temp ctrl sys) .....	0.072	287	1,118	124	235,982	1,900

<sup>1</sup> Emissions calculated based on 3,984 MMBtu/hr and 0.89 capacity factor, as used in the TSD for our proposal.

In recognition of the work already performed by SRP to meet the consent decree emission limit of 0.080 lb/MMBtu for Unit 2, and to avoid interfering with SRP's ability to meet that requirement by the deadline of June 1, 2014, we have decided not to require a BART emission limit for Coronado 2 more stringent than 0.080 lb/MMBtu. Instead, we are finalizing a plant-wide NO<sub>x</sub> emission limit for Coronado of 0.065 lb/MMBtu on a rolling 30-day average, which will provide a sufficient compliance margin for startup and shutdown events. We are also structuring the compliance determination method so that, when one of the two units is not operating, its emissions from the preceding thirty boiler-operating-days will continue to be included in the two-unit average. We expect that SRP can meet this limit by installing a low load temperature control system on Unit 2 and an SCR system including a low load temperature control system on Unit 1. We are setting a compliance deadline for achieving this limit of five years from publication of this final rule, which will ensure that SRP has adequate time to design and install these controls without interfering with the consent decree deadline of June 1, 2014 for operation of SCR on Unit 2. Finally, we are including in the regulatory text of the FIP a requirement that pollution control equipment be designed and capable of operating properly to minimize emissions during all expected operating conditions, consistent with the regulatory definition of BART as "an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction for each pollutant which is emitted by an existing stationary facility."<sup>194</sup>

*Comment:* While supporting EPA's determination that SCR is BART for Coronado Unit 1, one commenter (Earthjustice) stated that lower NO<sub>x</sub> emission limits are cost-effective and achievable. For Unit 1, the commenter made the following two points based on a report (the "Sahu report") submitted with the comments. First, SCR can achieve even greater NO<sub>x</sub> reductions at less cost than EPA's calculations. EPA failed to analyze whether an emission limit lower than 0.05 lb/MMBtu is achievable and cost-effective with SCR at Unit 1 as required under the BART Guidelines. Second, the NO<sub>x</sub> emissions exiting Coronado Unit 1's boiler could be reduced significantly from the current rate of approximately 0.3 lb/MMBtu to a rate of 0.15 to 0.20 lb/MMBtu, which would result in a lower achievable emission rate. Neither ADEQ nor EPA analyzed the various methods of reducing these NO<sub>x</sub> emissions. The commenter (Earthjustice) noted that SRP submitted comments to EPA shortly before EPA issued the proposed rule arguing that SCR with a 0.05 lb/MMBtu NO<sub>x</sub> emission limit is unachievable at Unit 1 (and Unit 2).<sup>195</sup> According to the commenter, SRP argued that EPA's proposal is not achievable by pointing to BART proposals in other states that required SCR with an emission limit less stringent than 0.05 lb/MMBtu. The commenter countered that these BART determinations for other sources in other states do not show that EPA's BART proposal is unachievable at Coronado Unit 1, as BART determinations are source-specific. The commenter added that SRP's comments

provide no source-specific data explaining why SCR at Unit 1 could not achieve a 0.05 lb/MMBtu NO<sub>x</sub> emission limit. The commenter asserted that, in contrast, the Sahu report explains why an even lower 0.04 lb/MMBtu emission limit is achievable at Unit 1. Accordingly, the commenter believes that EPA should not weaken its BART proposal as SRP requested. *Response:* We disagree with the commenter's assertion that our BART analysis should have examined the potential for lower "boiler-out" NO<sub>x</sub> emission rates.<sup>196</sup> The commenter cites several examples of other coal-fired boilers using PRB coal achieving boiler-out NO<sub>x</sub> emission rates in the range of 0.096 to 0.154 lb/MMBtu, and points to these examples as evidence that the Apache and Coronado units could attain lower emission rates through the use of combustion controls. We note that the best performing units on this list are primarily tangential- or wall-fired units, and that none of the units appear to be Riley turbo-fired boilers. Particularly in the case of the Apache and Coronado units, which are turbo-fired boilers, we consider this distinction crucial when determining the appropriate units with which to compare emission performance. The Riley-turbo boiler is a unique wall-fired boiler design that is characterized by a venturi-shaped lower section (often described as a "pinch" in the boiler wall) with burners located on the underside of the pinched wall, tilted slightly downwards.<sup>197</sup> It is a relatively uncommon design, with only two dozen such units currently in operation.<sup>198</sup>

<sup>194</sup> 40 CFR 51.301. See also, CAA section 302(k), 42 U.S.C. 7602 (defining "emission limitation" as

"a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction \* \* \*").

<sup>195</sup> Citing Docket Item C-16 (SRP Letter to DJordan 06-26-2012).

<sup>196</sup> As described by the commenter, the "boiler-out" NO<sub>x</sub> emission rate refers to the emission rate after including the effects of combustion controls such as low NO<sub>x</sub> burners, over-fire air, neural networks, adaptive controls, etc.

<sup>197</sup> See "Design and Operation of Coal-fired TURBO furnaces for NO<sub>x</sub> control", Riley Stoker Corporation, November 1978.

<sup>198</sup> Acid Rain Program data indicates 22 turbo units were in operation in 2011.

The turbo boiler was developed in the 1960s and, unlike many other wall-fired boilers, was generally able to meet the NO<sub>x</sub> emission limits contained in the 1971 New Source Performance Standards for fossil fuel fired steam generators.<sup>199</sup> While Babcock Power, which acquired Riley Stoker, has developed new burner upgrades to meet more stringent NO<sub>x</sub> emission standards, the combustion control designs available for turbo-fired boilers have not been through the same number of design iterations, and are therefore not as effective as those for other boiler types.<sup>200</sup> We therefore do not consider it appropriate to compare the “boiler-out” emission rates of the Riley turbo design with those achieved by tangential and more traditional wall-fired units.

More specifically, combustion controls on Coronado 1 (LNB) were installed in 2009, and the commenter has not indicated any design improvements or upgrades that would achieve improved performance. We note that the baseline period for our analysis represented the use of combustion controls (in the form of LNB with OFA) and that our emission estimate of LNB is based on past actual emission data, as reported to CAMD, over the baseline period. As part of the supplemental cost analysis we performed, we used a baseline period that predated installation of LNB, and consisted of emission rates corresponding to OFA only.<sup>201</sup> Comparing annual average emission rates during the periods prior to and following LNB installation, we note that Coronado Unit 1 has achieved approximately 25 percent reduction from installing LNB at an emission rate of approximately 0.30 lb/MMBtu. We consider these values reasonable, as it is supported by actual emission data and represents a control efficiency similar to the 30 percent control efficiency assumed by our contractor.

In addition, we disagree with the commenter’s assertion that 0.04 lb/MMBtu is an appropriate SCR emission limit to consider for Coronado Unit 1. As discussed in the previous response to SRP’s comments, we have examined the analysis performed by SRP and determined that a 0.050 lb/MMBtu emission rate is not achievable by Coronado Unit 1 on a rolling 30-day average. Although we note that SRP’s analysis is based on a 0.04 lb/MMBtu

emission rate at full load, steady state conditions, and that SRP’s analysis indicates Coronado Unit 1 could achieve 0.050 lb/MMBtu on an annual average basis, we do not consider this emission rate achievable as a rolling 30-day limit based on the number of startup and shutdown events associated with its operating profile.

*Comment:* While supporting EPA’s determination that SCR is BART for Coronado Unit 2, one commenter (Earthjustice) stated that lower NO<sub>x</sub> emission limits are cost-effective and achievable. For Unit 2, the commenter made four major points. First, the NSR consent decree does not exempt Coronado Unit 2 from a NO<sub>x</sub> BART determination based on a valid five-factor BART analysis. Second, contrary to the argument that the 0.08 lb/MMBtu limit on Coronado Unit 2 under the consent decree was developed to address BACT obligations, that emission limit is not BACT, which requires a top-down analysis that selects the “maximum degree of reduction.” There is no BACT analysis in the consent decree and no explanation of how the 0.08 lb/MMBtu emission limit was selected. In addition, while BACT requires case-by-case analysis, the consent decree limit was not specific to Unit 2; it simply required installation of SCR on one of the two units. Third, the negotiated limit contained in the NSR consent decree cannot replace the required five-factor BART analysis for Coronado Unit 2 because BART is more stringent than the consent decree’s emission limit. The Sahu report shows that an emissions limit lower than 0.08 lb/MMBtu is cost-effective and achievable at Unit 2. Fourth, the NO<sub>x</sub> emissions exiting Coronado Unit 2’s boiler could be reduced significantly from the current rate of approximately 0.33 lb/MMBtu to a rate of 0.15 to 0.20 lb/MMBtu, which would result in a lower achievable emission rate. Neither ADEQ nor EPA analyzed the various methods of reducing these NO<sub>x</sub> emissions. SCR with a 0.04 lb/MMBtu emission limit at Coronado Unit 2 is achievable with various control methods and is even more cost-effective than EPA’s calculations suggest. Because of this, the commenter requested that EPA revise its BART determination to reflect this lower level.

The commenter (Earthjustice) stated that SRP has claimed that a NO<sub>x</sub> emission limit of 0.05 lb/MMBtu is unachievable based on its progress in constructing the SCR unit required by the NSR consent decree, but does not explain how construction progress to date would prevent it from calibrating the SCR to achieve a 0.05 lb/MMBtu

emission limit (or a 0.04 lb/MMBtu limit). The commenter noted that EPA requested information concerning whether the amount and management of catalyst could be altered to meet a 0.05 lb/MMBtu NO<sub>x</sub> limit at Unit 2, but according to the commenter SRP did not provide any such information. As a result, the commenter urged EPA to revise its BART determination to require SCR with an emission limit lower than 0.08 lb/MMBtu.

*Response:* We disagree with the commenter’s assertion that it is appropriate to consider lower “boiler-out” NO<sub>x</sub> emissions for Coronado Unit 2, for the same reasons we noted in the previous response for Coronado Unit 1 on this issue. We also disagree with the commenter’s assertion that 0.04 lb/MMBtu is an appropriate SCR emission rate to consider for Coronado Unit 2, also for the same reasons we noted in the previous response for Coronado Unit 1 on this issue.

We agree with the commenter’s assertions that the consent decree is not a replacement for a five-factor BART analysis. We also agree that while the consent decree resolved NSR/PSD obligations such as BACT, a “top-down” BACT analysis was not performed as part of the consent decree negotiations. Based on our review of SRP’s August 24, 2012 letter and submitted comments, we do not consider the SCR system for Coronado Unit 2, as currently designed, to constitute BART. As noted in the analysis contained in our response to SRP’s comments, we consider the installation of a low-load temperature controller to be both cost-effective and to result in substantial visibility improvement. We are not, however, finalizing a more stringent emission limit for Coronado Unit 2. Instead, we are finalizing a requirement that pollution control equipment be designed and capable of operating properly to minimize emissions during all expected operating conditions, consistent with the regulatory definition of BART as “an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction for each pollutant which is emitted by an existing stationary facility.”<sup>202</sup>

<sup>202</sup> 40 CFR 51.301. See also, CAA section 302(k), 42 U.S.C. 7602 (defining “emission limitation” as “a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction \* \* \*”).

<sup>199</sup> “An Overview of Riley Stoker’s Burner Development Efforts for NO<sub>x</sub> Control”, Riley Stoker Corporation, April 7, 1983.

<sup>200</sup> “Low NO<sub>x</sub> Combustion System Solutions for Wall Fired, T-Fired, and Turbo Fired Boilers.” Babcock Power, August 28–31, 2006.

<sup>201</sup> Supplemental Cost Analysis 2012–11–15.xls.

## c. Costs of Compliance

*Comment:* One commenter (NPS) agreed with EPA that SRP did not provide ADEQ with control cost calculations at a level of detail that allowed for a comprehensive review. The commenter conducted analysis of the cost and cost-effectiveness of adding SCR to reduce emissions of NO<sub>x</sub> at Coronado Unit 1 using the cost methodologies of the CCM and relying on the IPM to reflect the most recent SCR cost levels, and submitted the detailed calculations as Appendix E to its comments. The commenter's analysis yielded a cost-effectiveness value of \$2,540/ton. The commenter noted that EPA's analysis yielded a cost-effectiveness value of \$2,405/ton, which EPA considers cost-effective. Another commenter (Earthjustice) also asserted that SCR at Coronado 1 is cost-effective. When calculated based on an SCR emission rate of 0.04 lb/MMBtu, and when accurate cost figures and proper baselines are used, the commenter asserts that SCR would reduce NO<sub>x</sub> emissions at a cost of just \$2,024/ton of NO<sub>x</sub> removed.

NPS commented that it was not able to conduct a cost analysis for Coronado Unit 2, on which SRP is installing SCR to meet an emission limit of 0.080 lb/MMBtu under a consent decree with EPA. However, the commenter used the CCM to evaluate the differences between an SCR on this unit at 0.050 lb/MMBtu versus 0.080 lb/MMBtu. According to the commenter, an SCR meeting the more stringent limit would have essentially the same footprint as the less effective unit, but would require an additional layer of catalyst and would be seven feet taller. The commenter presented basic design parameters for SCR units achieving the two levels of control.

*Response:* We agree with NPS's assertion that SRP's cost figures, as provided in their original BART analysis and in the subsequent response to ADEQ's information request, were not sufficiently documented. While we also agree with the commenters' assertion that SCR with LNB and OFA is cost-effective, we decline to modify our estimates of cost-effectiveness to reflect the cost items noted in these comments, as it is not in any way determinative to our decision to find that SCR is "even more" cost-effective, or that the incremental cost-effectiveness value between SCR and SNCR is "even more" incrementally cost-effective.

*Comment:* One commenter (SRP) argued that EPA's cost of compliance analysis for Coronado is flawed and must be replaced with site-specific

costs. The commenter asserted that EPA improperly ignored site-specific cost estimates for Coronado BART control options by substituting its own estimates, and ignored the fact that Arizona has "the lead role in designing and implementing [its] regional haze program" and "broad authority over BART determinations" (citing *Corn Growers*, 291 F.3d at 3, 8). The commenter stated that ADEQ fully complied with the BART Guidelines and was justified in any deviation from the specific terms of the CCM because ADEQ engaged in a reasoned, site-specific cost analysis. The commenter added that ADEQ has discretion to conduct and document its cost assessment at a level that it deems appropriate, and that the documentation that supports ADEQ's BART determination is reasonable by any objective standard.

The commenter (SRP) asserted that EPA improperly ignored site-specific cost estimates for Coronado BART control options, instead using the IPM to calculate the capital costs and annual operating costs associated with the various NO<sub>x</sub> control options that EPA considered. Moreover, the commenter added that no cost estimate derived from a model designed to produce generalized information about utilities throughout the nation could satisfy the CAA requirement that BART be determined based on a site-specific analysis. SRP provided adjusted inputs for use in IPM for unit size, gross heat rate, NO<sub>x</sub> removal factor, NO<sub>x</sub> removal efficiency, ammonia cost, operating labor rate, bare module costs, urea costs and property taxes and insurance. SRP asserted that when these values are used in the model, the IPM outputs validate the site-specific costs provided by SRP (based on detailed SCR and SNCR cost comparisons provided in the comments), although the adjusted IPM results still under-predict the costs based on site-specific considerations.

The commenter (SRP) stated that its site-specific costs for SCR are based on the actual cost projections associated with the current SCR installation at Unit 2. The commenter stated that SRP has already made substantial progress on the Unit 2 SCR installation with more than 40 percent of the project already complete, with the engineering design effort more than 90 percent complete, and the overall procurement efforts more than 75 percent complete. As such, the commenter believes that the site-specific costs are appropriate for use in any evaluation of BART controls.

In addition, the commenter (SRP) indicated that its cost estimates for Unit 1 are conservative since they are based

on actual costs experienced for Unit 2 for which SCR has been designed to achieve an emission limit of 0.080 lb/MMBtu, rather than the 0.050 lb/MMBtu assumed by EPA for Unit 1. According to the commenter, there could be additional costs for Unit 1 of as much as \$117 million for additional catalyst and an increased ammonia emission rate, a dry sorbent injection control system to address increased sulfuric acid mist and condensable PM emissions, and a fabric filter baghouse and induced draft fans to address increased filterable PM emissions. The commenter stated that even without these additional costs, the site-specific cost estimate for an SCR system on Unit 1 is almost twice the value used by EPA in its BART determination, and for the SCR system on Unit 2, the actual cost incurred by SRP is likewise almost twice the value used by EPA in its BART determination. The commenter concluded that this documentation demonstrates the importance of using available site-specific cost estimates when conducting a BART determination for Coronado.

*Response:* We disagree with the commenter's assertion that the cost calculations SRP provided to ADEQ as part of the original BART analysis, or in the subsequent response to ADEQ's information request, were supported by sufficient documentation. For example, the annual O&M costs associated with an SCR system will involve such costs as reagent usage, catalyst replacement costs, and labor costs, among others. SRP provided no breakdown of annual O&M costs beyond the total annual O&M value. Similarly, SRP's capital cost estimates consist of only a total value, accompanied by a capital recovery factor to determine the corresponding annualized cost. This level of detail does not allow us, and could not have allowed ADEQ, to evaluate the reasonableness of SRP's cost estimates for Coronado. As noted in a previous response, we have identified several issues with the cost calculations performed for the Apache and Cholla units that are inconsistent with the methodology established by EPA's CCM. SRP's cost estimates do not provide sufficient detail for us to evaluate if they are consistent with CCM methodology.

Although we do not agree that our cost-effectiveness estimates were incorrect, we have performed a supplemental analysis for Coronado 1 using portions of the updated cost estimates provided by SRP in its comments. Our use of these cost estimates in this supplemental analysis should not be construed to represent an acceptance of SRP's revision to our IPM



assumptions. Rather, this supplemental analysis represents a conservative estimate of costs (i.e., an assumption that would tend to overestimate rather than underestimate the annualized cost of controls). A summary of cost estimates based on this supplemental analysis is displayed in Table 15.

- SRP's revised SNCR cost estimates: SRP also submitted a conceptual capital cost estimate for an SNCR system as part

of its comments. This estimate has excluded cost items not allowed by the CCM, such as AFUDC, escalation, and owner's costs, and have been included in the supplemental analysis.

- Original baseline period: As discussed elsewhere in our responses, we consider our use of a more recent baseline as consistent with BART Guidelines. However, in order to address commenter's concerns that we

did not properly consider LNB and OFA as a potential control option and therefore precluded a BART determination of LNB and OFA, we have used a baseline period of 2001–2003, which corresponds to the period used in SRP's original BART analysis. This represents a time period prior to the installation of LNB, during which the control technology in place on Coronado 1 was OFA-only.

TABLE 15—CORONADO UNIT 1: CONTROL COST ESTIMATES  
[Per SRP with EPA revisions]

Coronado 1 control technology	Capital cost (\$)	Annualized capital cost (\$/yr)	Annual O&M cost (\$/yr)	Total annual cost (\$/yr)
LNB+OFA .....	\$6,500,000	\$613,554	\$0	\$613,554
SNCR w/LNB+OFA .....	14,164,000	1,336,981	5,829,800	7,166,781
SCR w/LNB+OFA .....	80,633,219	7,611,205	4,492,736	12,103,941

Regarding SRP's concern that its own costs for Coronado Unit 1 are conservative (i.e., underestimated in this context) because they are based on a Coronado Unit 2 design that achieves 0.080 lb/MMBtu instead of 0.050 lb/MMBtu, we partially agree. For Coronado Unit 2, SRP identified certain additional costs that would be associated with design changes necessary to meet an emission rate more stringent than the consent decree limit of 0.080 lb/MMBtu. The two most important changes would be increased levels of ammonia injection and additional SCR catalyst (in the form of an additional fourth catalyst layer at the time of initial catalyst fill). The SCR catalyst is responsible for a certain amount of SO<sub>2</sub> to SO<sub>3</sub> conversion, which can then form sulfuric acid (H<sub>2</sub>SO<sub>4</sub>). SRP notes that the additional fourth catalyst layer can be expected to result in a collateral increase in sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) emissions. A dry sorbent injection (DSI) system may be needed to address this increase in sulfuric acid, which itself has the potential to increase filterable particulate emissions. Addressing this increase in filterable particulate emissions may in turn require installation of a fabric filter baghouse. Of the \$117 million in capital costs identified by SRP, the majority of these costs (\$113 million) are associated with construction of the DSI and fabric filter.

While we agree that designing Coronado Unit 1 to meet an annual

average emission limit of 0.050 lb/MMBtu will involve greater costs than a system designed to meet 0.080 lb/MMBtu, we disagree that the costs for Coronado Unit 1 are of the magnitude of those described above for Coronado Unit 2. Based on SRP's comments, we note that the SCR reactor box for Unit 2 has been designed for a "3+1" configuration (i.e., an initial three catalyst layers, with space for a fourth layer to be added later in the system's lifetime to maintain the same level of effectiveness) and has perhaps already been fabricated. As a result, accommodating additional catalyst cannot be achieved by increasing the volume of the initial three layers, but must be achieved by including the fourth catalyst layer (or some portion of it) during the initial fill. Since each catalyst layer is designed for a certain amount of SO<sub>2</sub> to SO<sub>3</sub> conversion, inclusion of an additional layer unavoidably results in an increase in the overall conversion rate. However, since an SCR system for Coronado Unit 1 has not been designed, we consider it feasible for SRP to specify a design at the outset that accommodates additional volume in the initial catalyst layers, thereby achieving a more stringent emission rate without the higher SO<sub>2</sub> to SO<sub>3</sub> conversion rate associated with a fourth catalyst layer. Moreover, even if SRP were required to install a DSI system or DSI and a fabric filter, EPA does not agree that these costs should be

considered part of the cost of compliance for the purposes of a BART determination. EPA cannot anticipate what control technology might be required in the future for sulfuric acid mist under PSD or minor NSR. The BART Guidelines do not require the inclusion of potential future costs that might be associated with permit requirements as part of the cost estimates for a BART determination.

Therefore, while we acknowledge that there are costs associated with additional catalyst and increased ammonia injection, they represent a small fraction (\$4 million) of the \$117 million total identified by SRP. We have used certain elements from SRP's estimates in preparing our supplemental cost analysis for Unit 1, but we have not adjusted SRP's estimates to reflect these factors since the cost estimates provided by SRP do not include a level of detail that would allow us to properly make such adjustments.

A summary of emission rates and emission reductions associated with each control option is in Table 16. As noted previously, these emission estimates are based on a 2001–2003 baseline period, during which the Coronado units operated only with OFA. We have calculated annual emission rates for the OFA baseline using the annual average emission data (lb/MMBtu) reported to CAMD over this 2001–2003 baseline period.

TABLE 16—CORONADO 1: ANNUAL EMISSION ESTIMATES

Coronado 1 control technology	Emission factor (lb/MMBtu) <sup>1</sup>	Heat rate (MMBtu/hr)	Annual capacity factor	Emission rate		Emissions removed (tpy)
				(lb/hr)	(tpy)	
OFA (only) .....	0.407	4,316	0.84	1,756	6,462	.....
LNB+OFA .....	0.303	4,316	0.84	1,308	4,811	1,651
SNCR w/LNB+OFA .....	0.212	4,316	0.84	915	3,368	3,095
SCR w/LNB+OFA .....	0.050	4,316	0.84	216	794	5,669

<sup>1</sup> Annual average basis.

Cost-effectiveness values for each control technology are summarized in Table 17, and are based on the total

annual costs and annual emissions removed listed in the previous tables.

TABLE 17—CORONADO 1: CONTROL OPTION COST-EFFECTIVENESS

Coronado 1 control technology	Total annual cost (\$/yr)	Emissions removed (tpy)	Cost-effectiveness (\$/ton)	
			Avg.	Incr.
OFA (only) .....				
LNB+OFA .....	\$613,554	1,651	\$372	
SNCR w/LNB+OFA .....	7,166,781	3,095	2,316	4,540
SCR w/LNB+OFA .....	12,103,941	5,669	2,135	1,918

Based on SRP’s capital and O&M cost estimates, we still consider the cost-effectiveness values of SCR, on an average (\$2,135/ton) and incremental (\$1,918/ton) basis, to not be cost-prohibitive. We consider these results supportive of our proposed determination that SCR with LNB and OFA is cost-effective. We note that while the LNB and OFA option is the least expensive (i.e., lowest annual cost) and is the most cost-effective of the control technologies (i.e., has the lowest \$/ton value), it is also the least effective control option (i.e., removes smallest quantity of NO<sub>x</sub>). It removes substantially fewer emissions than either of the other two control options, the SNCR- and SCR-based systems. As discussed in our proposed action, and in other responses in this document, we have not identified any energy or non-air quality impacts that warrant eliminating SCR from consideration for Coronado Unit 1. Combined with the modeled visibility improvement associated with the SCR control option, SRP’s cost estimates continue to support the selection of SCR with LNB and OFA as BART for Coronado 1.

*Comment:* One commenter (SRP) stated that the proposed rule and the TSD say almost nothing about how IPM was used to calculate costs, instead directing the public to an EPA contractor report for more information. The commenter asserted that no contractor report in the docket for the rulemaking supplies additional detail on precisely how IPM was used. The

commenter added that this failing renders EPA’s proposed rule inconsistent with the CAA’s public notice requirements.

*Response:* We disagree with the commenter’s assertion that we have not provided sufficient information regarding our cost calculations. In the e-docket for our proposal, we included the raw cost calculation spreadsheets from our contractor that contain the IPM equations, corresponding variable values, selected notes regarding assumptions and variable ranges, as well as selected tables from the IPM Base Case v4.10.<sup>203</sup> In addition, Web links were provided (both in the raw cost calculation spreadsheet and in our proposal) to the location on the publicly available EPA Web site that contains full IPM documentation.

*Comment:* One commenter (SRP) stated that EPA failed to follow the BART Guidelines by not conducting an incremental cost analysis for Coronado. According to the commenter, the proposed rule and TSD both provide a single entry for incremental costs for each of the Coronado units that reflect the incremental cost of the most stringent NO<sub>x</sub> BART control option compared to the baseline. The commenter asserted that this is not a complete incremental analysis because it ignores incremental comparisons between identified control options. SRP contended that in the absence of a

proper NO<sub>x</sub> BART assessment, the proposed rule lacks an adequate foundation. The commenter stated that the high incremental costs of post-combustion NO<sub>x</sub> control technologies when compared to combustion control technologies reinforces the conclusion that post-combustion control technologies cannot be the basis for BART for the units at Coronado.

*Response:* We disagree with the commenter’s assertion that we did not perform a sufficient incremental cost analysis for the Coronado units. In our control cost summaries (Table 22 in the proposed rule and Table 32 in the TSD), the column labeled “incremental cost-effectiveness” represents the \$/ton of the control option when compared to the preceding control option. The column labeled “average cost-effectiveness”, represents the \$/ton of the control option when compared to the baseline control. In the case of Coronado Unit 1, we considered two control options beyond the baseline: SNCR with LNB and OFA, and SCR with LNB and OFA. The “single entry for incremental costs”, as described in the comment, represents the incremental cost between the SNCR- and SCR-based options. An incremental cost value was not calculated between LNB with OFA (which is the option preceding the SNCR-based option) and SNCR because LNB with OFA represented the baseline control in our analysis. The cost-effectiveness of moving from LNB with OFA to SNCR with LNB and OFA is therefore

<sup>203</sup> Document ID: EPA-R09-OAR-2012-0021-0008, File name: G-15\_MODELING\_FILES\_EGU\_BART\_Costs\_Apache\_Cholla\_Coronado\_FINAL2.

adequately captured in the “average cost-effectiveness” column. We do note that, in our supplemental cost analysis, we have used OFA as the baseline control, and have therefore calculated an incremental cost-effectiveness value for moving from LNB with OFA to SNCR with LNB and OFA. These results are described in a previous comment and, as noted in that comment, we disagree with the commenter’s assertion that the incremental cost of post-combustion controls is cost-prohibitive.

#### d. Visibility Improvement

*Comment:* One commenter (SRP) asserted that EPA is without basis for establishing in the proposed rule a 0.5 deciview comparison threshold as a touchstone for analyzing impacts from Coronado BART controls, citing the BART Guidelines and associated preamble. According to the commenter, even if EPA could impose a 0.5 deciview comparison threshold, it is only by substituting its own preferred modeling methodology (which the commenters argued is something EPA cannot lawfully do) that EPA can project that requiring SCR at Unit 1 would barely yield a projected improvement of more than 0.5 deciview at one area. The commenter also noted that 0.5 deciview is below the level of human perceptibility.

*Response:* As explained above, we have not used 0.5 dv as a threshold, but as one point of comparison such as a “benchmark” or “yardstick” to gauge the magnitude of impacts under various control scenarios.

#### e. Other Comments

*Comment:* The commenter (NPS) agreed with EPA’s determination that NO<sub>x</sub> BART for Coronado Units 1 and 2 is SCR with LNB and OFA. The commenter noted that EPA proposed on Unit 1 an emission limit for NO<sub>x</sub> of 0.050 lb/MMBtu, based on a rolling 30-boiler-operating-day average, and on Unit 2 an emission limit of 0.080 lb/MMBtu, which is consistent with the emission limit in the consent decree. The commenter stated that EPA acknowledged that the emission limit for Unit 2 established in the consent decree was not the result of a BART five-factor analysis, and that the consent decree does not indicate that SCR at 0.080 lb/MMBtu represents BART. The commenter commended EPA for soliciting additional information on the feasibility of achieving a more stringent limit.

*Response:* We acknowledge the comment.

*Comment:* In response to EPA’s proposed BART determination in the

proposed FIP, one commenter (SRP) performed and submitted an assessment of the critical components of a BART analysis for Coronado, including control costs and the visibility improvements associated with the control options. The commenter indicated that this analysis shows that even without considering other energy and non-air quality environmental impacts associated with the implementation of SNCR or SCR, it is clear that the visibility benefits realized from implementation of post-combustion controls are not justified by the cost. The commenter also submitted the results of this analysis using CALPUFF version 6.42 in place of version 5.8. The commenter stated that this analysis provides even stronger evidence that selection of post-combustion controls as BART for Coronado is inappropriate.

*Response:* We disagree with this comment. As noted in a separate response, we have performed a supplemental cost analysis that relies upon many elements of the cost analysis provided by the commenter. Even with the higher cost estimates provided by the commenter, we consider the costs of post-combustion controls such as SNCR and SCR to be cost-effective on a \$/ton basis. In addition, as noted in a separate response, we disagree with several assumptions used in the commenter’s visibility modeling, such as the use of an unapproved CALPUFF model version and treatment of ammonia background concentrations. We therefore disagree that the visibility benefits modeled by the commenter are representative of the benefits that will accrue with the use of post-combustion controls. The modeling results performed in support of our proposal indicate substantial visibility benefits, especially with the SCR control option. As a result, we do not consider it appropriate to eliminate either of the post-combustion controls from consideration as BART. Although SCR is the most stringent control option, its associated visibility benefits and cost-effectiveness justify this technology as BART.

#### E. Comments on Enforceability Requirements in EPA’s BART FIP

*Comment:* One commenter (SRP) made the following points concerning the proposed enforceability requirements:

- EPA must modify the monitoring requirements to be consistent with existing requirements. If EPA proceeds to impose additional controls at Coronado beyond those specified in the consent decree and already included in the Coronado permit, it must align these

requirements to eliminate unnecessary and unreasonable compliance burdens.

- The commenter supports and appreciates the use of the monitoring system certification and quality assurance (QA) procedures in 40 CFR Part 75. However, EPA’s proposed definition of “valid” data is broader than 40 CFR Part 75, and EPA also should make clear that the “bias” adjustment procedures in 40 CFR Part 75 do not apply to data used to calculate the 30-day rolling averages.

- The commenter objects to the proposed additional relative accuracy requirements. Imposing additional relative accuracy test audit (RATA) specifications will not increase the accuracy of any monitoring system, but would increase the difficulty and cost of testing. It also could result in additional missing data if tests must be repeated to meet the specifications. To proceed with combined RATA specifications, EPA also would need to either propose (and solicit comment on) alternative low-emitter combined specifications that have been demonstrated to be consistently achievable, or exempt units meeting any of the applicable 40 CFR Part 75 low-emitter thresholds from those specifications.

- The commenter stated that the proposed data availability requirements are unnecessary and too stringent. Source owners and operators already have sufficient incentive to obtain valid data in order to avoid the increasingly conservative (and ultimately punitive) missing data substitution procedures that apply under 40 CFR Part 75. Regarding stringency, if a unit has a significant missing data event during a calendar quarter in which it also has a significant period of unit downtime (e.g., as a result of an outage), the percent of operating hours during the quarter with valid data could easily be less than 90 percent. It is in part for this reason that 40 CFR Part 75 measures data availability over each 8,760-operating-hour period. EPA should either eliminate the unnecessary requirement or provide data to justify its proposed requirement that take into account the differences described above.

- EPA must modify the quarterly reporting requirements to be consistent with existing requirements.

- EPA must modify the notification requirements in the proposed rule because they are overly broad and overly prescriptive. First, EPA should clarify the proposed provision by requiring notice only of new controls that will be required to meet the FIP or regional haze SIP. Second, because installation of controls is a complex process, and the point at which that

process is “complete” may not be immediately clear, EPA must revise the requirement to use a more objective term and allow sufficient time for owners and operators to comply. Third, because the proposed requirement duplicates reporting already required for a new add-on NO<sub>x</sub> emission control under 40 CFR Part 75, EPA should rely on (and if necessary refer to) the notice required under Part 75.

*Response:* We partially agree with this comment and are adjusting the enforceability requirements of the final FIP accordingly. EPA agrees that the Part 75 bias adjustment should not be applied to the compliance data for the BART rules in this action and is making changes to the final rule to address this comment. However, EPA does not agree that only the incentives under the Acid Rain Part 75 rules are sufficient to assure adequate valid data for this rule. Part 75 relies on progressively punitive data substitution procedures to promote good valid data availability for its program. Our rule does not substitute data, so the incentives of the Part 75 rules do not exist. Therefore, EPA is requiring that each unit subject to this rule obtain 90 percent valid data, as determined under Part 75, for each calendar year.

It should be noted that the commenter did not submit any data specific to its EGUs indicating the difficulty of meeting the proposed valid data availability requirements. Also, the other two utility companies affected by this rule did not make any objection to the proposed data requirements. However, EPA, as a result of this comment, has reconsidered the additional quality assurance and valid data requirements from the proposal. As indicated by the commenter, measurement and QA requirements for NO<sub>x</sub> lb/hour are not currently required by Part 75. In addition, EPA recognizes that the calculation of heat input requires the combination of the flow and diluent (O<sub>2</sub> or CO<sub>2</sub>) CEMS along with measurements of temperature and estimation of moisture. In addition in the final rule, EPA is providing for a multi-unit determination of compliance. This would compound the valid data concerns of the commenter. EPA requires monitoring data used for compliance determinations to be of known quality as demonstrated through Quality Assurance/Quality Control (QA/QC) procedures.<sup>204</sup> In place of the requirement to validate through RATA testing of the NO<sub>x</sub> lb/hour measurement and heat input, EPA will require that all

of the CEMS required by Part 75 and used for the compliance demonstrations for this action obtain 90 percent valid data (per Part 75 specifications) for each unit over each calendar year. In addition, the rule will require the affected units to conduct RATA evaluations and calculate the quarterly valid data hours for NO<sub>x</sub> lb/hour and heat input. EPA will not finalize the minimum data requirements in the proposal, but will require these data to be calculated (all data for determining the relative accuracy in these units are available when Part 75 RATAs are performed) and reported to both EPA and ADEQ to determine if these data are capable of meeting more rigorous QA/QC requirements in the future. We also note that the final rule will add QA/QC and minimum valid data requirements for the inlet SO<sub>2</sub> CEMS that are needed to calculate the SO<sub>2</sub> removal efficiencies for the Cholla EGUs. Finally, EPA agrees that semiannual reporting will be sufficient for this rule, and the final rule will reflect this.

*Comment:* One commenter (AEPCO) requested that EPA clarify that AEPCO has longer than 180 days to comply with the non-SCR limits. The commenter is particularly concerned about the time needed for the ESP and scrubber upgrades and believes a five-year period for all BART implementation would be appropriate. ADEQ also commented that the facility will need more than 180 days to complete the upgrades needed to meet the SO<sub>2</sub> BART limits, and stated that a five-year compliance time frame from the time the BART limit is finalized, as specified in RHR Appendix Y, is most appropriate.

*Response:* EPA agrees that AEPCO would need more than the 180 days in the proposed rule. However, we do not agree that five years is necessary to perform the necessary upgrades. The final rule will require AEPCO's two units to meet the SO<sub>2</sub> and PM<sub>10</sub> limits within four years of the effective date of this rule. This time frame will allow AEPCO to perform the upgrades to the two units during regularly scheduled maintenance outages.

*Comment:* Several commenters (ADEQ, AEPCO, APS, EarthJustice, NPS, SRP) provided feedback on test methods. AEPCO supported maintaining the use of EPA Method 201A to comply with the proposed BART PM<sub>10</sub> limits. In contrast, ADEQ and APS only supported the use of Methods 201A and 202 if SCR controls are not used. These commenters stated that SCR causes an increase in sulfuric acid aerosol mist, which results in an increase in condensable particulate matter. APS suggested Methods 1–4 and

Method 5 or 5e are appropriate where SCR is used. ADEQ suggested Method 5 or 5e where SCR is used, and states that any collateral increase in acid mist should be addressed through a permitting process. SRP stated that wet scrubbers also render Methods 201 and 201A inapplicable, and requested that EPA specify the use of Method 5, 5B, 5I or an approved alternative.

One commenter (NPS) pointed out that use of SCR at these units is expected to result in increased condensable particulate matter in the form of sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>), which would have the effect of making the emission limit more stringent than intended by ADEQ, and likely not be achievable in practice. To address EPA's request for comment on whether to allow compliance with the PM<sub>10</sub> limit to be demonstrated using test methods that do not capture condensable particulate matter, namely EPA Methods 1 through 4 and Method 5 or Method 5e, the commenter conducted and submitted an analysis of H<sub>2</sub>SO<sub>4</sub> emissions. According to the commenter, H<sub>2</sub>SO<sub>4</sub> emissions will not be significant, contributing less than 10 percent to the PM<sub>10</sub> limit. The commenter suggested that the 0.030 lb/MMBtu limit proposed by ADEQ for the Apache and Coronado units be adjusted to 0.033 lb/MMBtu to reflect the increase in total PM<sub>10</sub> attributable to SCR, and that PM<sub>10</sub> emissions would be measured by conducting EPA Method 201A/202 tests consistent with the ADEQ's SIP.

In contrast to the previous commenters, one commenter (Earthjustice) stated that EPA should approve the test methods in the ADEQ RH SIP (i.e., EPA Methods 201 and 202) and ensure that the BART limit includes both filterable and condensable PM fractions. The commenter asserted that if EPA allows or requires a test method other than Method 201 and 202, the PM<sub>10</sub> BART emission limit would effectively be less stringent because it would only apply to filterable PM, and not total PM. The commenter indicated that requiring different test methods would in effect be proposing an even less-stringent PM<sub>10</sub> BART limit, which would require EPA to undertake an independent BART analysis that demonstrates that the less-stringent emission limit is BART. Consequently, according to the commenter, if EPA requires or allows a different test method, it must lower the emission limit to reflect only the filterable PM<sub>10</sub> fraction. The commenter added that in this case, EPA should ensure that compliance with the filterable PM<sub>10</sub> limit is demonstrated with use of CEMS

<sup>204</sup> See, e.g., 40 CFR 60.13(a) and 40 CFR Appendix F.

for filterable PM, which is currently available.

*Response:* ADEQ selected test methods 201 and 202 for determining compliance with this limit. EPA noted in the proposal that the proposed addition of SCR for NO<sub>x</sub> control would likely increase the quantity of PM collected as condensable PM by method 202 due to an increase in H<sub>2</sub>SO<sub>4</sub> from the oxidation of SO<sub>2</sub> to SO<sub>3</sub>. EPA requested comment on changing the test method from methods 201 and 202 to EPA Method 5 which measures only the filterable PM. Method 5 measures all sizes of filterable PM which results in a higher filterable PM value than Methods 201 or Method 201A, which only measure filterable PM<sub>10</sub>.

In its comments concerning the proposal for Coronado, SRP noted that Method 201A cannot be used in a wet exhaust gas stream. We agree with this comment. In promulgating amendments to Method 201A and Method 202 in 2010, EPA explained that:

Method 201A cannot be used to measure emissions from stacks that have entrained moisture droplets (e.g., from a wet scrubber stack) since these stacks may have water droplets that are larger than the cut size of the PM<sub>10</sub> sizing device. The presence of moisture would prevent an accurate measurement of total PM<sub>10</sub> since any PM<sub>10</sub> dissolved in larger water droplets would not be collected by the sizing device and would consequently be excluded in determining total PM<sub>10</sub> mass. To measure PM<sub>10</sub> in stacks where water droplets are known to exist, EPA's Technical Information Document 09 (Methods 201 and 201A in Presence of Water Droplets) recommends use of Method 5 of appendix A-3 to 40 CFR part 60 (or a comparable method) and consideration of the total particulate catch as PM<sub>10</sub> emissions.<sup>205</sup>

It is also true that the rarely used Method 201 cannot be used in a wet exhaust stream (also known as a "wet stack").<sup>206</sup>

At this time, the three facilities subject to this BART rule have a mix of wet and dry stacks. EPA anticipates that the SO<sub>2</sub> BART limits set by ADEQ will result in 100 percent of the exhaust gas undergoing SO<sub>2</sub> scrubbing. Neither ADEQ nor EPA is requiring reheat of the exhaust gas stream. Therefore, it is likely that all of the coal-fired units covered by this action will have wet stacks. So it is doubtful that any filterable PM<sub>10</sub> method would work as the compliance method.<sup>207</sup> Therefore,

<sup>205</sup> 75 FR 80118, 80121.

<sup>206</sup> See EPA's Technical Information Document 09, "Methods 201 and 201A in Presence of Water Droplets" (September 9, 1991).

<sup>207</sup> See, e.g. 75 FR 80126 ("Monitoring the emission of PM<sub>10</sub> or PM<sub>2.5</sub> from a wet gas stream is a challenging problem that has not been addressed successfully despite considerable effort.

EPA is finalizing a decision to allow either Method 5 or Methods 201A and 202 for demonstrating compliance with the BART PM<sub>10</sub> limits set by ADEQ.

As noted above, the addition of the SCR to these EGUs for NO<sub>x</sub> control will likely increase the condensable PM that will be measured by Method 202. By offering the option of Method 5 or Methods 201A and 202, the facilities can determine which methods are compatible with their units' stack conditions and will best demonstrate the proper operation of their PM controls. Any significant increase in H<sub>2</sub>SO<sub>4</sub> and the appropriate control of this visibility impairing pollutant will be addressed through the PSD permitting process with a BACT determination for H<sub>2</sub>SO<sub>4</sub> control. The significance level that triggers permitting for H<sub>2</sub>SO<sub>4</sub> is an increase of seven tons per year of this pollutant.<sup>208</sup> Coronado has already received a PSD permit for H<sub>2</sub>SO<sub>4</sub> that is likely to result from the increase in H<sub>2</sub>SO<sub>4</sub> resulting from the SCR required under the consent decree.

EPA's AP-42 indicates that approximately one third of the filterable PM emissions from EGUs are larger than PM<sub>10</sub>. This means that the change from Method 201 (or 201A) to Method 5 as the compliance method will result in this increased measurement of PM. This is offset by the elimination of the condensable measurement of Method 202 and as noted above, the utilities will have the option of using either testing approach.

*Comment:* One commenter (APS) requests that EPA change the compliance date for the PM<sub>10</sub> limit at Cholla Unit 2 to January 1, 2016, rather than January 1, 2015. The commenter explained that EPA misunderstood the language of the ADEQ SIP, which refers to APS's commitment to install a fabric filter by 2015, to mean installation and operation by the first of the year, whereas this commitment actually meant by the end of 2015, or December 31, 2015. The commenter further requested that this date be extended to April 16, 2016, if the ADEQ approves APS's request for a one-year extension to comply with the Mercury and Air Toxics Standards (MATS) before EPA finalizes this BART determination.

The commenter also requested that EPA change the compliance date with the 0.15 lb/MMBtu SO<sub>2</sub> emissions standard from 180 days after promulgation to January 1, 2016, or April 16, 2016, to allow sufficient time

A consensus method to provide this information has not emerged.")

<sup>208</sup> See 40 CFR 52.21(b)(23)(i).

to do the necessary upgrades for Unit 2. This unit will require scrubber upgrades that need to be done concurrent with the fabric filter installation to accommodate the increase in pressure drop that a new fabric filter will impose. ADEQ also stated a compliance date of April 1, 2016, would be more appropriate than January 1, 2015, for both the PM<sub>10</sub> and SO<sub>2</sub> limits at Cholla Unit 2.

*Response:* EPA agrees with this comment and has changed the compliance date in the final rule to April 1, 2016.<sup>209</sup> In addition, as explained above, in order to ensure that the wet FGD (i.e. scrubbers) on all three units at Cholla are properly operated and maintained, consistent with 40 CFR 51.308(e)(1)(v), we are finalizing a removal efficiency requirement for SO<sub>2</sub> of 95 percent on a 30-day rolling basis for Cholla Units 2, 3 and 4. Compliance with the efficiency requirement will be determined by SO<sub>2</sub> continuous emission monitoring systems (CEMS) operated at the inlets and outlets of the scrubbers. Units 3 and 4 already have SO<sub>2</sub> and CO<sub>2</sub> CEMS installed after the scrubbers, and Unit 2 has SO<sub>2</sub> and CO<sub>2</sub> CEMS installed before the scrubbers.<sup>210</sup> Therefore, SO<sub>2</sub> and diluent CEMS will need to be installed at the inlets to the scrubbers on Units 3 and 4. We estimate that the total annualized cost for this installation (including ongoing operation and maintenance costs) will be approximately \$51,000 per unit.<sup>211</sup> We also note that this efficiency requirement will probably result in a slight increase in operation and maintenance costs in the form of additional limestone and scrubber waste disposal expenses. Even considered collectively, these additional costs are *de minimis* in comparison to the annualized cost of SCR (i.e., \$9,906,206 to \$13,590,853 per unit at Cholla, according to our supplemental cost analysis) or the total cost of installing a new wet FGD system, which APS has estimated to be \$67.0 to \$70.9 million.<sup>212</sup> In order to allow sufficient

<sup>209</sup> Although APS requested a deadline of April 16, 2016, this request was contingent upon ADEQ's approval of APS's August 7, 2012 request for a one-year extension to comply with the MATS. ADEQ's comments indicate that April 1, 2016 is the appropriate deadline for this requirement, so we have modified the final compliance deadline to April 1, 2016.

<sup>210</sup> See Cholla Title V Permit (2012), Table C-3: Continuous Emission Monitors.

<sup>211</sup> We used EPA's CEMS Cost Model (available at <http://www.epa.gov/ttn/emc/cem.html>) to estimate the total annualized cost of adding inlet CEMS for SO<sub>2</sub> and CO<sub>2</sub>. See "CEMS Cost Calculation."

<sup>212</sup> APS Comments, Table 3-8. No annualized cost was provided.

time for installation of the CEMS, the compliance deadline for this removal efficiency requirement at these units will be one year after publication of this final rule for Units 3 and 4. The removal efficiency compliance deadline for Unit 2 will coincide with the compliance date for the lb/MMBtu SO<sub>2</sub> emission limit for this unit (i.e., April 1, 2016).

*Comment:* Two commenters requested that EPA implement SCR installation in three rather than five years. Earthjustice claimed that the proposed five-year compliance deadline is unreasonable and inconsistent with the CAA and RHR requirements, noting that compliance before the “outside date” is required whenever earlier compliance is possible. This commenter contended that average SCR installations have required 37 to 43 months to implement, and EPA has provided no site-specific factors for these plants to require a longer-than-average installation time. The commenter notes that ADEQ has an “accelerated permit processing” program, so that any PSD permits needed to address sulfuric acid mist increases should not require an extension of the compliance deadline to five years. The commenter also requested that EPA obtain and post to the docket the outage schedule for these plants, which may provide additional justification for a compliance deadline shorter than five years. In contrast, SRP commented that, if EPA finalizes a requirement for SCR at Unit 1 “a five-year compliance period is certainly warranted.” SRP noted that it estimated it would require 48 months to install SCR at Coronado Unit 2, and that installing SCR on Unit 1 would be even more complicated due to the reduced amount of space following the installation on Unit 2.

*Response:* We are finalizing a compliance deadline of five years from final publication of this notice for all SCR-based emission limits. As explained in our proposal, five years is a reasonable time frame for SCR design and installation, particularly where retrofits of multiple units at a single facility are required. Granting the full five years for SCR design and installation will allow the facilities to tie in the SCR systems during routinely scheduled maintenance outages, which are typically scheduled for every three years. With respect to Coronado in particular, the five-year compliance schedule will allow SRP sufficient time to design and install the SCR system on Unit 1 and to design and install a low-load temperature controller on Unit 2, which likely must be done in the period after the SCR for Unit 2 is placed into operation (June 1, 2014).

*Comment:* One commenter (Earthjustice) stated that EPA should set BART limits for PM<sub>2.5</sub> and PM<sub>10</sub>, rather than just PM<sub>10</sub>. The commenter indicated that the BART Guidelines specify that BART should be evaluated and defined for both PM<sub>2.5</sub> and PM<sub>10</sub> (citing 40 CFR part 51, Appendix Y, section II.A.3).

*Response:* The BART Guidelines do not require states to set BART limits for PM<sub>2.5</sub> in addition to limits for PM<sub>10</sub>. The portions of the BART Guidelines cited by commenters (i.e. sections II.A.3 and III.A.2) pertain to the identification of sources that are BART-eligible and sources that are subject-to-BART, not the actual five-factor analysis or determination of BART for a given source, which is described in section IV of the Guidelines. With respect to the five-factor analysis, the Guidelines provide that, “[m]odeling should be conducted for SO<sub>2</sub>, NO<sub>x</sub> and direct PM emissions (PM<sub>2.5</sub> and/or PM<sub>10</sub>).”<sup>213</sup> The Guidelines thus provide states with the flexibility to consider either PM<sub>2.5</sub> or PM<sub>10</sub> emissions or both, as part of their five-factor analysis. Likewise, the Guidelines do not require that the emission limits reflecting BART should include separate limits for PM<sub>2.5</sub> and PM<sub>10</sub>.<sup>214</sup> Thus, we are not required by the RHR to set separate BART limits for PM<sub>2.5</sub>.

#### F. Comments on Legal Issues

*Comment:* A number of commenters asserted that EPA has acted in a manner contrary to the CAA, under which states are to play the lead role in designing and implementing the regional haze program. These commenters typically indicated that EPA is required to defer to the states’ judgment regarding BART where the state has considered the five statutory BART factors, and has no authority to override a state’s BART determination simply because it disagrees with the state’s conclusions. The commenters often stated that the states are empowered by the CAA to determine how best to weigh each of the statutory BART factors and that EPA’s only legal role in SIP review is to determine whether the state’s plan is consistent with the CAA. The commenters generally stated the belief that ADEQ’s BART determinations fully complied with the CAA, the Regional Haze Rule and the BART Guidelines. The commenters frequently cited *American Corn Growers Ass’n. v. EPA*, 291 F.3d (D.C. Cir. 2002); *EME Homer City Generation, L.P. v. EPA*, No.

11-1302, slip op. at 42 (D.C. Cir. Aug. 21, 2012) (“CSAPR decision”); *Luminant Generation Co. v. EPA*, 675 F.3d 917, 921 (5th Cir. 2012); and *State of Texas, et al., v. EPA*, 690 F.3d 670 (5th Cir. 2012).

Several commenters stated that EPA made no finding that Arizona failed to satisfy its statutory obligation to consider and weigh the BART factors, and asserted that EPA conceded that the state had done so in its FIP proposal (citing 77 FR 42851). Some commenters (AEPCO, SRP) stated that EPA proposed to disapprove the SIP, in part, because it is not consistent with BART decisions that other states have made (citing 77 FR 42836), and contended that this finding is irrelevant to the approvability of ADEQ’s SIP. One commenter (SRP) added that ADEQ’s BART determinations are entirely legal and reasonable and, to the extent that other states’ BART determinations may be relevant, consistent not only with the action of other states, but with action that EPA has approved or proposed to approve for those states (i.e., combustion controls as BART for NO<sub>x</sub>).

Two commenters added that EPA purported to defer to ADEQ’s BART determinations by indicating that it would prefer to act on a SIP revised to address the deficiencies perceived by EPA (citing 77 FR 42839), but the commenters asserted that it is not deference to invite the State to submit a SIP that conforms to EPA’s policy choices. The commenters contended that in any case, with the court ordered deadline of November 15, 2012, for EPA to finalize the proposed FIP, it would be impossible for Arizona to prepare and adopt a revised SIP in time.

*Response:* We do not agree that our partial disapproval of the Arizona Regional Haze SIP is contrary to the CAA. As noted by several commenters, States have the lead role in determining BART for individual sources through SIPs. However, EPA also has a crucial role in reviewing SIPs for compliance with the requirements of the CAA and its implementing regulations. Pursuant to CAA section 110, States must submit SIPs to EPA for review and EPA must review SIPs for consistency with the Act’s requirements and disapprove any SIP revision that “would interfere with any applicable requirement” of the Act.<sup>215</sup> The CAA also empowers EPA to call for SIP revisions “[w]henever [EPA] finds that the applicable implementation plan for any area is substantially inadequate to \* \* \* comply with any requirement of this

<sup>213</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.5.

<sup>214</sup> *Id.* Section V.

<sup>215</sup> CAA section 110(a)(1), (k)(3) and (l), 42 U.S.C. 7410(a)(1), (k)(3) and (l).

chapter,” and impose sanctions when EPA determines they are “reasonable and appropriate for the purpose of ensuring that the requirements [of the Act] \* \* \* are met.”<sup>216</sup> Furthermore, the Act mandates that EPA promulgate a FIP when EPA finds that a State has failed to submit a required SIP to the Agency, failed to submit a complete SIP, or where EPA disapproves a SIP.<sup>217</sup> Thus, the CAA provides EPA with a critical oversight role in ensuring that SIPs meet the requirements of the CAA.

Nothing in the CAA indicates that EPA’s role is less important in the context of the Regional Haze program than under other CAA programs. On the contrary, CAA section 110(a)(2)(j) explicitly requires that SIPs “meet the applicable requirements” of Part C of Title I of the CAA including the requirements for visibility protection set forth in sections 169A and 169B.<sup>218</sup> Pursuant to section 169A(b), EPA is required to promulgate visibility protection regulations that apply to “each applicable implementation plan” (i.e., each SIP or FIP)<sup>219</sup> for each State containing one or more Class I areas and each State “emissions from which may reasonably be anticipated to cause or contribute to any impairment of visibility in any [Class I area].”<sup>220</sup> The CAA specifies that these regulations (including the RHR) must require each such SIP or FIP to “contain such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal,” including implementation of BART, as determined by the State (or by EPA in the case of a FIP).<sup>221</sup> Moreover, the CAA requires that BART for each “fossil-fuel fired generating power plant having a total generating capacity in excess of 750 megawatts” must be determined pursuant to the guidelines promulgated by EPA (i.e., the BART

Guidelines).<sup>222</sup> Thus, the statute provides EPA a key oversight role in reviewing SIPs for compliance with the RHR and BART requirements.

The cases cited by commenters do not support an argument that EPA’s role as a reviewer is any less critical in the regional haze context than it is in reviewing other SIP components. In *American Corn Growers v. EPA*, the petitioners challenged the original RHR because, among other things, the RHR treated one of the five statutory factors differently than the others by requiring States to consider the degree of visibility improvement from imposing BART on a group of sources rather than on a source-specific basis.<sup>223</sup> The court concluded that such a requirement could force States to apply BART controls at sources without evidence that the individual sources contributed to visibility impairment at a Class I area, which encroached on States’ primary authority under the regional haze provisions to determine which individual sources are subject to BART and what BART controls are appropriate for each source.<sup>224</sup> Therefore, the court vacated the visibility improvement part of the original RHR as contrary to the statute.<sup>225</sup> Contrary to some commenters’ suggestions, however, the *American Corn Growers* decision did not address EPA’s authority to reject a State’s BART determinations for failure to conform to the CAA, the RHR or the BART Guidelines.

Commenters also cite *Luminant Generation v. EPA*, 675 F.3d 917, 921 (5th Cir. 2012) and *Texas v. EPA*, 690 F.3d 670 (5th Cir. 2012). Neither of these cases involves BART or the CAA’s regional haze provisions at all. Rather, they involved EPA’s disapprovals of SIP revisions involving Texas’s minor new source review (NSR) program. As noted by the *Luminant* court, “because ‘the Act includes no specifics regarding the structure or functioning of minor NSR programs’ and because the implementing regulations are ‘very general [.] \* \* \* SIP-approved minor NSR programs can vary quite widely

from State to State.’”<sup>226</sup> By contrast, Regional Haze SIPs and BART determinations are subject to detailed requirements set forth in CAA sections 169A, the RHR and the BART Guidelines. While in *Luminant* and *Texas*, the Fifth Circuit found that EPA had failed to tie its disapproval to any requirement of the CAA or EPA’s implementing regulations,<sup>227</sup> in this case our disapproval is based on the SIP’s failure to comply with CAA sections 110(a)(2) and 169A(b)(2)(A), as implemented through the RHR and the BART Guidelines.

As noted above, CAA section 110(a)(2)(j) requires all SIPs to “meet the applicable requirements” of Part C of Title I of the CAA, including the requirement that each source found subject-to-BART, “procure, install, and operate, as expeditiously as practicable (and maintain thereafter) the best available retrofit technology \* \* \*”<sup>228</sup> Section 169A(g)(2) further provides that:

In determining best available retrofit technology the State (or the Administrator in determining emission limitations which reflect such technology) shall take into consideration the costs of compliance, the energy and nonair 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.<sup>229</sup>

Similarly, 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 within the State. In this analysis, the State must take into consideration the technology available, the costs of compliance, the energy and nonair 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 improvement in visibility which may reasonably be anticipated to result from the use of such technology.<sup>230</sup>

ADEQ’s BART determinations for NO<sub>x</sub> at Apache Units 2 and 3, Cholla Units 2, 3 and 4 and Coronado Units 1 and 2 fall short of these requirements in several respects.

First, ADEQ did not analyze the “best system of continuous emission control

<sup>216</sup> See *id.* 42 U.S.C. 7410(k)(5), (m).

<sup>217</sup> See *id.* section 7410(c)(1).

<sup>218</sup> CAA sections 110(a)(2)(j), 169A and 169B 42 U.S.C. 7410(a)(2)(j), 7491 and 7492.

<sup>219</sup> Under the CAA, “applicable implementation plan” is defined as “the portion (or portions) of the implementation plan, or most recent revision thereof, which has been approved under [CAA section 110], or promulgated under [CAA section 110](c) \* \* \* and which implements the relevant requirements of [the CAA].” CAA section 302(q), 42 U.S.C. 7602(q). In other words, an “applicable implementation plan” is an EPA-approved SIP or Tribal Implementation Plan, or an EPA-promulgated FIP.

<sup>220</sup> 42 U.S.C. 7491(b)(2). In promulgating the RHR, EPA determined that “all States contain sources whose emissions are reasonably anticipated to contribute to regional haze in a Class I area and, therefore, must submit regional haze SIPs.” 64 FR 35720; see also 40 CFR 51.300(b)(3).

<sup>221</sup> 42 U.S.C. 7491(b)(2).

<sup>222</sup> *Id.* In this case, Cholla and Coronado each have a total generating capacity in excess of 750 megawatts, while Apache has a total plant-wide generating capacity of 560 megawatts. Thus, the BART Guidelines are mandatory for BART determinations at Cholla and Coronado and serve as non-binding guidance with respect to Apache.

<sup>223</sup> 291 F.3d at 5–9.

<sup>224</sup> *Id.* at 7–8.

<sup>225</sup> EPA revised the RHR to address the court’s decision in *American Corn Growers* at the same time as we promulgated the BART Guidelines. 70 FR 39104 (July 6, 2005). The revised RHR and the Guidelines were upheld by the D.C. Circuit in *Utility Air Regulatory Group v. EPA*, 471 F.3d 1333 (D.C. Cir. 2006).

<sup>226</sup> 675 F.3d at 922 (citing 74 FR 51418, 51421 (Oct. 6, 2009)).

<sup>227</sup> 675 F.3d at 924, 929; 690 F.3d at 679, 682, 686.

<sup>228</sup> CAA section 169A(b)(2)(A), 42 U.S.C. 7491(b)(2)(A).

<sup>229</sup> 42 U.S.C. 7491(g)(2).

<sup>230</sup> 40 CFR 51.308(e)(1)(ii)(A).

technology available and associated emission reductions achievable.” Rather it accepted the source’s own assertions about what emissions reductions were achievable with various control technologies. For example, in response to comments from the FLMs arguing that SCR could achieve lower rates on 30-day-rolling average, ADEQ stated that:

ADEQ’s BART evaluations were based on site-specific information provided by the applicants. It is the Department’s understanding that such information was based partially on feedback received from vendors and plant personnel who are intimately familiar with the specific equipment that is being considered. In that regard, the Department based its BART computations on the emission rates proposed by the applicant for the different control technology options.<sup>231</sup>

While it is certainly reasonable to consider site-specific information provided by the sources as part of a BART analysis, it is not reasonable to assume, with no independent analysis, that the sources have appropriately identified the emissions reductions achievable with the best available controls. ADEQ provided no evidence that the sources’ estimates were based on legitimate site-specific considerations or that ADEQ undertook any verification of these estimates. Therefore, ADEQ has not demonstrated that its BART determinations were “based on an analysis of the best system of continuous emission control technology available and associated emission reductions achievable.”

Second, ADEQ has not demonstrated that it actually took into consideration the BART factors in making its determinations. In particular, while ADEQ provided information regarding each of the factors, it gave no explanation or rationale for how it reached a determination based on that information.

Finally, ADEQ did not appropriately consider the “degree of improvement in visibility which may reasonably be anticipated” from installation of BART because it did not consider visibility benefits at all of the affected Class I areas, nor did it consider the total visibility benefit expected to result from the entire BART-eligible source. Overlooking significant visibility benefits at additional areas and from multiple BART-eligible units considerably understates the overall benefit of controls to improve visibility and is contrary to the very purpose of BART, i.e., “eliminating or reducing”

visibility impairment at all Class I areas.<sup>232</sup> Thus ADEQ’s BART determinations for NO<sub>x</sub> at Apache Units 2 and 3, Cholla Units 2, 3 and 4 and Coronado Units 1 and 2 do not meet the requirements of CAA section 169A(g)(2) or 40 CFR 51.308(e)(1)(ii)(A).

In addition, 40 CFR 51.308(e)(1)(ii)(B) provides that:

The determination of BART for fossil-fuel fired power plants having a total generating capacity greater than 750 megawatts must be made pursuant to the guidelines in appendix Y of this part (Guidelines for BART Determinations under the Regional Haze Rule).

Cholla and Coronado each have a generating capacity greater than 750 megawatts. Therefore, the BART determinations for these BART sources must be made pursuant to the BART Guidelines. However, ADEQ’s BART determinations for these sources did not fully comply with the BART Guidelines. In particular, as explained more fully above, contrary to the Guidelines’ direction that “cost estimates should be based on the *OAQPS Control Cost Manual*, where possible,” the control cost calculations supplied by the utilities and relied upon by ADEQ included line item costs not allowed by the Control Cost Manual, such as owner’s costs, surcharge, and AFUDC. Thus, ADEQ’s consideration of the “cost of compliance” for these units was not consistent with the Guidelines. Furthermore, as explained above, ADEQ’s consideration of visibility benefits was inconsistent with the Guidelines because the State did not consider benefits at multiple Class I areas and multiple BART-eligible units at each source. In addition, ADEQ failed to provide “a justification for adopting the technology [the State selected] as the ‘best’ level of control, including an explanation of the CAA factors that led [the State] to choose that option over other control levels.”<sup>233</sup> Therefore, ADEQ’s BART determinations for NO<sub>x</sub> at Cholla and Coronado do not comply with 40 CFR 51.308(e)(1)(ii)(B).

Finally, for all pollutants at all units covered by today’s action, ADEQ’s Regional Haze SIP does not meet the requirements of 40 CFR 51.308(e)(1)(iii) and (iv) because it lacks the following elements:

- A requirement that each source subject to BART be required to install and operate BART as expeditiously as practicable, but in no event later than 5 years after approval of the implementation plan revision.

- A requirement that each source subject to BART maintain the control equipment required by this subpart and establish procedures to ensure such equipment is properly operated and maintained.

These two requirements are mandatory elements of the RHR and are necessary to ensure that BART is procured, installed and operated, as expeditiously as practicable and maintained thereafter, as required under CAA section 169A(b)(2)(A). Moreover, CAA section 110(a)(2) requires that emissions limits such as BART be “enforceable” and section 302(k) requires emissions limits to be met on a continuous basis. Arizona’s Regional Haze SIP lacks requirements for monitoring, recordkeeping and reporting sufficient to ensure that the BART limits are enforceable and are met on a continuous basis.

Therefore, Arizona’s BART determinations for Apache, Cholla and Coronado do not meet several requirements of the CAA, the RHR and the BART Guidelines. Accordingly, we are compelled to partially disapprove Arizona’s Regional Haze SIP.

Finally, several commenters cited *EME Homer City Generation v. EPA*, No. 11–1302 (D.C. Cir. Aug. 21, 2012). In *EME Homer City Generation*, the D.C. Circuit vacated EPA’s “Transport Rule” (also known as the “Cross-State Air Pollution Rule” or “CSAPR”), which was promulgated by EPA to address interstate transport of SO<sub>2</sub> and NO<sub>x</sub> under CAA section 110(a)(2)(D). The court found that the Transport Rule exceeded EPA’s authority under section 110(a)(2)(D) because the rule had the potential to require upwind States to reduce emissions by more than their own significant contributions to downwind nonattainment and because EPA had not given states an opportunity to submit SIPs after it quantified their obligations for emissions reductions to address transport. Commenters here point to the D.C. Circuit’s statements concerning state and federal roles under the CAA and argue that EPA has exceeded its statutorily mandated role in proposing to disapprove portions of Arizona’s Regional Haze SIP and promulgate a FIP.

While we agree that the general principles concerning state and federal roles under Title I of the CAA apply to our action here, we do not agree that our action here is inconsistent with those principles. In this action, we are fulfilling our statutory duty to review Arizona’s Regional Haze SIP, including its BART determinations, for compliance with the applicable requirements of the CAA and the RHR, and to disapprove any portions of the

<sup>231</sup> Arizona Regional Haze SIP, Appendix E, “Responsiveness Summary” at 13.

<sup>232</sup> CAA section 169A(b)(2)(A).

<sup>233</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.E.2.



plan that do not meet those requirements. Based on our review of the SIP, we proposed to determine that certain elements of Arizona's Regional Haze SIP did meet the requirements of the CAA and the RHR, and we proposed to approve those elements. However, for the reasons explained in detail in our proposal and elsewhere in this document, we have concluded that Arizona's BART determinations for NO<sub>x</sub> at several units did not comply with the requirements of the CAA and the RHR. Based on these findings, we are required to disapprove these portions of Arizona's Regional Haze SIP.

In some instances, we expressed our findings of non-compliance with the relevant requirements in terms of "disagreement" with the state's analysis. These statements were not intended to suggest that our proposed partial disapproval was simply based on policy disagreements with the state. Rather we used the term "disagree" as a short hand for our findings that specific elements of Arizona's analyses did not meet the requirements of the CAA and the RHR. For example, we noted that, "[w]e disagree with several aspects of the NO<sub>x</sub> BART analysis for Apache Units 2 and 3."<sup>234</sup> We then went on to list the specific deficiencies in the state's analysis, and concluded that "we are proposing to disapprove ADEQ's BART determination for NO<sub>x</sub> at Apache Units 2 and 3, since it does not comply with 40 CFR 51.308(e)(1)(ii)(A)."<sup>235</sup> We made similar findings with respect to ADEQ's BART determination for NO<sub>x</sub> at Cholla Units 2, 3 and 4 and Coronado Units 1 and 2.<sup>236</sup> We have also described in detail, both in our proposal and in this document, the other aspects of the state's BART determinations that do not comply with the CAA and the RHR.

Finally, some commenters appear to have misunderstood our statement that ADEQ's "NO<sub>x</sub> BART determinations for the coal-fired units are neither consistent with the requirements of the Act nor with BART decisions that other states have made." As noted by several commenters, the CAA and the RHR provide states with considerable discretion in deciding how to weigh the statutory factors as a part of a BART analysis. However, this discretion must be reasonably exercised in compliance with the applicable requirements. Consistency with other EPA-approved BART determinations is one marker of reasonableness, as well as compliance with the requirements of the RHR. Such

consistency is particularly relevant for BART determinations at fossil-fuel fired power plants having a capacity in excess of 750 megawatts, which must be made pursuant to the BART Guidelines.<sup>237</sup> To the extent a BART determination for such a power plant is plainly inconsistent with EPA-approved determinations for similar sources, it is more likely to be inconsistent with the RHR and the BART Guidelines and therefore to warrant greater scrutiny for compliance with the applicable requirements.

*Comment:* Several commenters (ACCCE, ADEQ, APS, SRP) asserted that it is contrary to the CAA for EPA to propose action on only the portions of ADEQ's SIP that address the three power plants that are the subject of the proposed FIP. One commenter (APS) stated that EPA may not ignore all other sources of visibility-impairing pollutants in the state (nor may it ignore the other categories of visibility-impairing pollutants by focusing only on nitrates, sulfates and PM) and establish BART limitations for the three affected power plants outside the context of the long-term strategy and larger reasonable progress requirements of the regional haze program. Commenters ACCCE, ADEQ and SRP contended that CAA section 110(k)(3) requires EPA either to approve a SIP submittal "as a whole" or to approve that SIP submittal in part and disapprove it in part in a single rulemaking that addresses in its entirety "the plan revision." The commenters indicated that this requirement of the CAA is sensible because it is the plan *as a whole*, with all its elements working together, that must ensure that the CAA's regional haze-related goals are being reached; any other approach to SIP review and approval would fail to take into account the full array of regulatory choices that Arizona has made to address regional haze.

*Response:* We do not agree that we are required to act on Arizona's Regional Haze SIP as a whole. As noted by some commenters, our action on Arizona's Regional Haze SIP is governed by *inter alia*, CAA section 110(k)(3), which provides that in the case of any submittal on which the Administrator is required to act under section 110(k)(2), the Administrator shall approve such submittal as a whole if it meets all of the applicable requirements of this chapter. If a portion of the plan revision meets all the applicable requirements of this chapter, the Administrator may approve the plan revision in part and disapprove

the plan revision in part. The plan revision shall not be treated as meeting the requirements of this chapter until the Administrator approves the entire plan revision as complying with the applicable requirements of this chapter.<sup>238</sup>

Some commenters have read this provision as requiring that EPA act on Arizona's Regional Haze SIP as a whole. We disagree that this language addresses the question of whether EPA may consider different elements of a State's plan in separate notice and comment rulemakings. However, even assuming that this provision of the Clean Air Act did limit EPA's ability to act sequentially on portions of a SIP submission, the requirement to act on a submittal "as a whole" applies only if the submittal meets all of the applicable requirements of the CAA. As explained in our proposal and elsewhere in this document, we have determined that the Arizona Regional Haze SIP does not meet all of the applicable requirements of the CAA. Specifically, we have determined that the submittal as a whole does not meet the requirements of CAA section 169A(b)(2)(A), as implemented through the RHR and the BART Guidelines. Under these circumstances, we are clearly not obligated to act on the plan as a whole, but are given discretion to act on distinct portions of the plan.<sup>239</sup>

While we agree that, as a matter of policy, it is generally preferable to act on plan submissions as a whole, we are currently subject to a court-ordered deadline of November 15, 2012 to act on the BART determinations for Apache Generating Station, Cholla Power Plant and Coronado Generating Station.<sup>240</sup> Although these BART determinations are part of the overall Regional Haze plan for Arizona, they are also severable from that plan, since BART determinations are made on a source-by-source basis and are not dependent upon other elements of the plan.<sup>241</sup>

<sup>238</sup> 42 U.S.C. 7410(k)(3).

<sup>239</sup> See *Hall v. EPA*, 273 F.3d 1146, 1159 (9th Cir. 2001) (section 110(k)(3) "permits the EPA to issue 'partial approvals,' that is, to approve the States' SIP revisions in piecemeal fashion").

<sup>240</sup> EPA agreed to this deadline after concluding that litigation would most likely result in a shorter schedule than that to which Plaintiffs had agreed in negotiation. See *Sierra Club v. Johnson*, 444 F.Supp.2d 46, 58 (D.D.C. 2006) ("this case devolves to a single issue: whether defendant has met the 'heavy burden' of demonstrating that it would be impossible to comply with plaintiff's proposed \* \* \*").

<sup>241</sup> See 40 CFR 51.308(e)(1)(ii)(A) ("[t]he 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-

<sup>234</sup> 77 FR 42846.

<sup>235</sup> *Id.*

<sup>236</sup> 77 FR 42849, 42851.

<sup>237</sup> CAA section 169A(b) and 40 CFR 51.308(e)(1)(ii)(B).

Therefore, we are taking action on these BART determinations first and we will act on the remainder of the Arizona Regional plan in accordance with the court-ordered deadlines for that action.

*Comment:* One commenter (ADEQ) asserts that EPA does not have the authority to adopt a FIP because none of the three triggering events for a FIP under CAA section 110(c)(1) has occurred. Specifically, the commenter states that:

\* \* \* for EPA to have authority to promulgate a regional haze FIP in Arizona, one of three events must have occurred: (1) a finding of failure to submit a regional haze SIP, (2) a finding of failure to satisfy the minimum criteria for a complete regional haze SIP under section 110(k)(1)(A) or (3) disapproval of a regional haze SIP submitted by Arizona. None of these three events has occurred.

With respect to EPA's January 2009 finding of failure to submit, the commenter argues that:

Section 110(c)(1) \* \* \* does not allow EPA to treat the omission of elements from a SIP submission as a failure to submit a SIP. Section 110(c)(1) is quite specific. If EPA believes SIP omissions render a SIP incomplete, the agency may make a finding under section 110(k)(1)(A) within the time period required by section 110(k)(1)(B) and start the FIP clock under the second clause of section 110(c)(1)(A). If EPA cannot make such a finding or, as in this case, fails to do so, the agency may disapprove the SIP, and start the FIP clock under section 110(c)(1)(B). By treating the alleged omission of elements from a SIP as the failure to make a required submission under the first clause of section 110(c)(1)(A), EPA is circumventing these procedures.

The commenter adds that if EPA did have the authority to promulgate a regional haze FIP, it would only have the authority to address those elements of the SIP that EPA identified as having not been submitted, and EPA has never found that Arizona failed to submit a SIP establishing BART.

*Response:* We do not agree that we lack authority to issue a FIP addressing BART requirements for the three sources covered by today's action. The commenter's arguments in this regard appear to be based on a misunderstanding of the requirements of the CAA and the RHR in relation to Arizona's Regional Haze submittals.

EPA promulgated the original RHR in 1999.<sup>242</sup> As relevant here, section 308 of the RHR requires states to submit SIPs that establish reasonable progress goals and long-term strategies for achieving those goals and provide for implementation of BART.<sup>243</sup> In addition

eligible source that is subject to BART within the State."

to the general requirements of section 308, EPA also adopted specific provisions that gave a handful of states, including Arizona, the option of submitting a regional haze SIP based on the recommendations of the Grand Canyon Visibility Transport Commission (GCVTC). Under the RHR, a SIP approved by EPA as meeting all of the requirements of section 309 would be "deemed to comply with the requirements for reasonable progress with respect to the 16 Class I areas [on the Colorado Plateau] for the period from approval of the plan through 2018."<sup>244</sup>

Arizona made two submittals under section 309 in 2003 and 2004, but never submitted a complete 309 SIP.<sup>245</sup> Rather, on December 24, 2008, ADEQ sent a letter to EPA re-submitting its prior 309 SIP submissions and acknowledging that the submittal did not include provisions to address the requirements of 309(d)(4) or 309(g).<sup>246</sup> These were not minor omissions: 309(d)(4) required the submission of "better than BART" milestones and a trading program for SO<sub>2</sub>, as well as BART requirements for stationary source PM and NO<sub>x</sub> emissions, and 309(g) required implementation of any additional measures necessary to demonstrate reasonable progress for the additional Class I areas, in compliance with the provisions of § 51.308(d)(1) through (4).<sup>247</sup> Thus, as of 2008, ADEQ's Regional Haze SIP, by its own admission, did not include provisions addressing BART (or for an alternative to BART) for NO<sub>x</sub>, PM or SO<sub>2</sub>. On January 15, 2009 EPA found that 37 states, including Arizona, had failed to make all or part of the required SIP submissions to address regional haze.<sup>248</sup> We explained that:

This finding starts the two year clock for the promulgation by EPA of a FIP. EPA is not required to promulgate a FIP if the state makes the required SIP submittal and EPA takes final action to approve the submittal within two years of EPA's finding.<sup>249</sup>

Under the CAA, any party seeking judicial review of EPA's finding of failure to submit ("2009 Finding") was required to file a petition for review with the appropriate United States Circuit Court of Appeals within 60 days of publication of the Finding in the

<sup>245</sup> We have included a more detailed history of Arizona's submissions under 309 in the docket for this action (Docket No. EPA-R09-OAR-2012-0021).

<sup>246</sup> Letter from Stephen A. Owens, ADEQ, to Wayne Nastro, EPA (Dec. 14, 2008).

<sup>247</sup> 40 CFR 51.309(d)(4)(i) and (vii), (g)(2).

<sup>248</sup> 74 FR 2392.

<sup>249</sup> *Id.* at 2393

**Federal Register.**<sup>250</sup> No party filed such a petition.

At the time of the 2009 Finding, EPA anticipated that ADEQ would submit a SIP revision covering 309(d)(4) and 309(g), which would enable EPA to fully approve ADEQ's 309 SIP as meeting all of the requirements of the Regional Haze Rule, thus ending the FIP clock. However, ADEQ did not submit a 309 SIP revision to address these two elements, but instead decided to develop a 308 SIP, which it submitted to EPA in February 2011.

In January 2011, EPA received a notice of intent to sue covering dozens of states, including Arizona, stating that we had not met the statutory deadline for promulgating Regional Haze FIPs and/or approving Regional Haze SIPs. This notice was followed by a lawsuit filed by several advocacy groups (Plaintiffs) in August 2011.<sup>251</sup> In order to resolve this lawsuit and avoid litigation, EPA entered into a Consent Decree with the Plaintiffs, which sets deadlines for action for all of the states covered by the lawsuit, including Arizona. This decree was entered and later amended by the Federal District Court for the District of Columbia over the opposition of Arizona.<sup>252</sup>

In opposing the entry of the consent decree, Arizona argued that the 2009 Finding did not give EPA authority to promulgate a Regional Haze FIP for Arizona. The court rejected this argument, explaining that:

Arizona contends that the Finding did not constitute a disapproval of the SIPs that had previously been submitted because it only notes that Arizona did not submit two of Section 309's required elements. *Ariz. Opp.* [Dkt. # 24] at 6. The Court does not read the 2009 Finding so narrowly. In the Court's view, the 2009 Finding reaches a conclusion that Arizona 'has failed to make a required submission or finds that the plan or plan revision submitted by the State does not satisfy the minimum criteria.' 42 U.S.C. 7410(c)(1). Under the CAA, this triggers the EPA's statutory obligation to promulgate a FIP.<sup>253</sup>

Under the terms of the Consent Decree, as amended, EPA is currently subject to two sets of deadlines for taking action on Arizona's Regional Haze SIP. Specifically, the CD requires that:

By the "Proposed Promulgation Deadlines" set forth in Table A below EPA shall sign a notice(s) of proposed rulemaking in which it

<sup>250</sup> CAA section 307(b). 42 U.S.C. 7607(b).

<sup>251</sup> *National Parks Conservation Association v. Jackson* (D.D.C. Case 1:11-cv-01548).

<sup>252</sup> *National Parks Conservation Association v. Jackson* (D.D.C. Case 1:11-cv-01548), Memorandum Order and Opinion (May 25, 2012) and Minute Order (July 2, 2012).

<sup>253</sup> See *NPCA v. EPA*, (D.D.C. Case 1:11-cv-01548). Dkt # 35, at 3, n. 1.

proposes approval of a SIP, promulgation of a FIP, partial approval of a SIP and promulgation of a partial FIP, or approval of a SIP or promulgation of a FIP in the alternative, for each State therein, that collectively meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.

By the "Final Promulgation Deadlines" set forth in Table A below, EPA shall sign a notice(s) of final rulemaking promulgating a FIP for each State therein to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations, except where, by such deadline EPA has for a State therein signed a notice of final rulemaking unconditionally approving a SIP, or promulgating a partial FIP and unconditional approval of a portion of a SIP, that collectively meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.

Table A, as revised, sets a proposal deadline for BART determinations for Apache Generating Station, Cholla Power Plant and Coronado Generating Station of July 2, 2012 and the final action deadline for these three BART determinations of November 15, 2012. The deadline for EPA to propose action on the remainder of the Arizona Regional Haze SIP is December 8, 2012, and the deadline for final action is July 15, 2013.<sup>254</sup>

Thus, pursuant to CAA section 110(c)(1) and the court's orders entering and amending the Consent Decree, we are not only authorized, but are required to issue a FIP for any portion of the Arizona SIP that we cannot approve. For the reasons stated in our proposal and elsewhere in this document, we have determined that we cannot approve the state's BART determinations for NO<sub>x</sub> at Apache, Cholla and Coronado, nor can we approve the compliance-related requirements that were omitted from the Arizona Regional Haze SIP. Therefore, we are obligated to promulgate a FIP to address these requirements.

*Comment:* Several commenters (AUG, EEI, PacifiCorp, SRP) stated that EPA cannot propose or finalize a NO<sub>x</sub> BART FIP for these Arizona plants until it has taken final action (following notice-and-comment rulemaking) on ADEQ's Regional Haze SIP. According to the commenters, EPA's authority to propose and then take final action to promulgate a FIP comes into existence only when a

state has not submitted a SIP or when EPA has made a final determination that a submitted SIP is not approvable (citing *Train v. NRDC*, 421 U.S. 60, 79 (1975)). The commenters believe this principle is confirmed by CAA sections 307(d)(1)(B), (3) and (6) because EPA cannot present the relevant factual, legal, and policy information and rationale necessary to justify a proposed or final FIP rule until it has properly taken final action on any relevant SIP before it.

One commenter (EEI) also states that EPA's assertion that it was compelled to propose a FIP at the same time that it disapproved a portion of the Arizona SIP, due to a two-year FIP clock that started with EPA's 2009 Finding of Failure to Submit, is inconsistent with the CSAPR decision. The commenter stated that EPA did not provide sufficient notice of the problems with the SIP to enable Arizona to remedy them, which is precisely the same problem identified by the CSAPR court. The commenter adds that EPA must provide the state a realistic opportunity to avoid being pulled into a FIP. Given that EPA has consent decree obligations to finalize BART requirements for the EGUs addressed by the proposed SIP by November 15, 2012, and EPA did not propose disapproval of the SIP until July 20, 2012, a reasonable opportunity to develop and receive approval of a revised SIP was not offered to the state.

*Response:* We do not agree that we are required to take final action on Arizona's Regional Haze SIP before promulgating a FIP. Commenters' arguments to this effect appear to conflate the procedural requirements for EPA's issuance of a FIP with procedural requirements for action on a SIP. In fact, these two actions are governed by different provisions of the CAA.

As explained in the previous response, EPA's 2009 finding that Arizona failed to submit a complete Regional Haze SIP triggered a "FIP clock" under CAA section 110(c).<sup>255</sup> This FIP clock could only have been stopped if Arizona had submitted, and EPA had fully approved a Regional Haze SIP, before January 15, 2011. Neither of these two things occurred. Therefore, EPA remains subject to this "FIP duty." Our action today fulfills part of that duty.

As several commenters noted, Arizona submitted a Regional Haze SIP

on February 28, 2011, and the SIP was deemed complete by operation of law on August 28, 2011, pursuant to CAA section 110(k)(1)(B).<sup>256</sup> This, in turn, triggered a deadline of August 28, 2012, for us to take final action on the SIP, pursuant to CAA section 110(k)(1)(B).<sup>257</sup> We acknowledge that this deadline has now passed and we intend to act as quickly as possible to fulfill our duty to act on those portions of the SIP not addressed in today's action. However, the fact that we have not acted on the entirety of the SIP submittal does not remove or otherwise alter our legal obligation to promulgate a FIP under CAA section 110(c). Our FIP duty does not terminate until we have actually approved the submitted SIP. As explained in our NPRM, TSD and elsewhere in this document, we cannot approve the State's BART determinations for NO<sub>x</sub> at Apache, Cholla and Coronado, nor can we approve the compliance-related requirements that were omitted from the Arizona Regional Haze SIP. Therefore, we are obligated to promulgate a FIP to address these requirements, and we are doing so in today's action.

Furthermore, while we agree that the procedural requirements for promulgation of a FIP under 110(c) are set forth in CAA section 307(d),<sup>258</sup> we do not agree that our action violates that provision in any way. Consistent with the requirements of that section, our proposal included a summary of the factual data on which our proposed FIP was based, as well as the methodology used in obtaining the data and in analyzing the data and the major legal interpretations and policy considerations underlying the proposed FIP.<sup>259</sup> In addition, we provided a detailed evaluation of Arizona's BART analyses for the relevant units, which formed the basis for our proposed action on those portions of the Arizona Regional Haze SIP.<sup>260</sup> This final rulemaking includes similar information with respect to the SIP and the FIP, as well as "an explanation of the reasons for any major changes in the promulgated rule from the proposed rule" and "a response to each of the

<sup>256</sup> 42 U.S.C. 7410(k)(1)(B).

<sup>257</sup> 42 U.S.C. 7410(k)(2).

<sup>258</sup> See CAA section 307(d)(1)(B), 42 U.S.C. 7607(d)(1)(B), ("This subsection applies to \* \* \* the promulgation or revision of an implementation plan by the Administrator under [CAA section 110](c)")

<sup>259</sup> See CAA section 307(d)(3), 42 U.S.C. 7607(d)(3).

<sup>260</sup> The SIP portion of our action is subject to the procedural requirements of section 553(b) of Administrative Procedure Act (APA), 5 U.S.C. 553(b), rather than the requirements of CAA subsection 307(d), 42 U.S.C. 7607(d).

<sup>254</sup> On November 13, 2012, the D.C. District Court granted a motion by EPA to modify the Consent Decree to extend the deadlines for promulgation of a FIP for any remaining elements of the SIP that are disapproved. Under the revised deadlines, EPA will propose any necessary FIP elements by March 8, 2013, and finalize such elements by October 15, 2013.

<sup>255</sup> 42 U.S.C. 7410(c). See also *Train*, 421 U.S. at 64, 79 (explaining that the 1970 CAA Amendments "sharply increased federal authority and responsibility in the continuing effort to combat air pollution," including giving EPA authority to devise a FIP if the State's plan fails to satisfy the standards of section 7410(a)(2)).

significant comments, criticisms, and new data submitted in written or oral presentations during the comment period.”<sup>261</sup> Therefore, our action complies with the applicable procedural requirements of the CAA.

Finally, we do not agree with commenters’ assertions that the D.C. Circuit’s decision in *EME Homer City Generation* precludes us from promulgating a partial FIP concurrently with our partial disapproval of Arizona’s Regional Haze SIP. In *EME Homer City Generation*, the court found that EPA had acted improperly in issuing the Transport Rule because we simultaneously defined states’ “good neighbor obligations” under CAA section 110(a)(2)(D)(i)(I) and issued FIPs to address those obligations.<sup>262</sup> The court explained that:

\* \* \* the triggers for a FIP are EPA’s finding that the SIP fails to contain a “required submission” or EPA’s disapproving a SIP because of a “deficiency.” But logically, a SIP cannot be deemed to lack a required submission or be deemed deficient for failing to implement the good neighbor obligation until after EPA has defined the State’s good neighbor obligation. Once it defines the obligation, then States may be forced to revise SIPs under Section 110(k)(5) or to submit new SIPs under Section 110(a)(1). Only if that revised or new SIP is properly deemed to lack a required submission or is properly deemed deficient may EPA resort to a FIP for the State’s good neighbor obligation.<sup>263</sup>

In essence, the D.C. Circuit found that EPA’s findings of failure to submit and disapprovals of state transport SIPs did not trigger FIP obligations under CAA section 110(c) because these actions occurred “before [EPA] told the States what emissions reductions their SIPs were supposed to achieve under the good neighbor provision.”<sup>264</sup>

In this case, by contrast, EPA defined states’ obligations under the RHR and the BART Guidelines well in advance of its findings of failure to submit and subsequent SIP disapprovals. EPA promulgated the original RHR on July 1, 1999.<sup>265</sup> Following the D.C. Circuit’s decision in *American Corn Growers*, EPA revised the RHR and issued the final BART Guidelines on July 6, 2005.<sup>266</sup> The revised RHR and the Guidelines were upheld by the DC Circuit in *Utility Air Regulatory Group v. EPA*, 471 F.3d 1333 (D.C. Cir.

2006).<sup>267</sup> As explained in our proposal and elsewhere in this document, the BART Guidelines provide detailed instructions to states on how to determine which sources are subject to BART and how to analyze the five statutory factors in order to set emissions limits representing BART for each subject-to-BART source.<sup>268</sup> In 2006, responding to specific questions from various States and Regional Planning Organizations (RPOs), EPA issued further guidance to help States implement the RHR and BART Guidelines.<sup>269</sup>

As noted in prior responses, EPA issued a finding of failure to submit for Regional Haze SIPs on January 15, 2009, thus triggering a FIP clock under CAA section 110(c).<sup>270</sup> By this time, states had already had more than three years since issuance of the final BART Guidelines (and more than two years since the final revisions to the RHR and the issuance of further guidance on the RHR and BART) to develop their Regional Haze SIPs. By the time the FIP clock actually ran out in January 2011, EPA had received Regional Haze SIPs from nearly every state. EPA has since proposed to approve, in part or in whole, the vast majority of these SIPs.<sup>271</sup> We have also has taken final

<sup>267</sup> In response to another D.C. Circuit decision, *Center for Energy and Economic Development v. EPA*, 398 F.3d 653 (D.C. Cir. 2005), EPA revised the RHR’s provisions governing alternatives to source-specific BART determinations on October 13, 2006. These revisions did not alter the requirements for source-specific BART determinations that apply to Arizona’s BART determinations at issue here.

<sup>268</sup> 40 CFR Part 51, Appendix Y. While the Guidelines are only mandatory for fossil fuel-fired electric generating plants with a total generating capacity in excess of 750 megawatts, States are encouraged to follow the BART Guidelines in making BART determinations for other types of sources. *Id.* section I.H. The Guidelines also set specific presumptive limits for SO<sub>2</sub> and NO<sub>x</sub> for these large power plants, but allow states to apply more or less stringent limits based upon source-specific five-factor analyses. 70 FR 39131–39132.

<sup>269</sup> Memo from Joseph W. Paise Regarding Regional Haze Regulations and Guidelines for BART (July 19, 2006); Additional Regional Haze Questions (Guidance) (Sept. 27 2006). In addition, EPA issued final “Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program” on June 1, 2007, but this Guidance is not directly relevant for individual BART determinations.

<sup>270</sup> 74 FR 2392.

<sup>271</sup> See, e.g., 76 FR 36450 (Nevada); 77 FR 24794 (New York); 76 FR 13944 (California); 77 FR 11798 (Rhode Island); 76 FR 27973 (Delaware); 77 FR 12770 (Nebraska); 77 FR 18052 (Colorado); 76 FR 16168 (Oklahoma); 77 FR 11914 (Vermont); 77 FR 11928 (Wisconsin); 76 FR 52604 (Kansas); 76 FR 64186 (Arkansas); 77 FR 11839 (Maryland); 76 FR 58570 (North Dakota); 77 FR 3966 (Illinois); 76 FR 76646 (South Dakota). EPA proposed limited approval and limited disapproval of the Regional Haze SIPs of states covered by the Clean Air Interstate Rule (CAIR), due to the remand of CAIR by the D.C. Circuit. See, e.g. 77 FR 3691 (Jan. 25, 2012) (proposing limited approval and limited disapproval of Virginia’s Regional Haze SIP).

action to approve, in part or in whole, many of these SIPs.<sup>272</sup> This stands in contrast to the situation in *EME Homer City Generation*, where, the court noted that, “every Transport Rule State that submitted a good neighbor SIP for the 2006 24-hour PM<sub>2.5</sub> NAAQS was disapproved.”<sup>273</sup> Thus, it is clear that states had ample opportunity to submit approvable Regional Haze SIPs before EPA was obligated to promulgate Regional Haze FIPs under CAA section 110(c).

With respect to Arizona’s Regional Haze SIP in particular, we note that Arizona first made public its proposed 308 SIP during a comment period beginning on October 28, 2010.<sup>274</sup> At that time, EPA, the National Park Service (NPS) (in consultation with the Fish and Wildlife Service) and the U.S. Forest Service all submitted comments expressing concern about the proposed SIP’s compliance with the CAA, the RHR and the BART Guidelines.<sup>275</sup> Among other things, EPA noted that the SIP, “does not provide a sufficient level of information and analysis to support its conclusions.”<sup>276</sup> NPS provided extensive comments on the proposed SIP, including detailed evaluations of ADEQ’s BART analyses for each of the three sources at issue in today’s action.<sup>277</sup> In each instance, NPS concluded that ADEQ had not conducted a valid BART analysis for NO<sub>x</sub>.<sup>278</sup> The Forest Service concurred with the initial comments provided by NPS on Arizona’s BART exclusion process and “strongly disagree[d] with the adequacy of the Arizona reasonable progress analysis.”<sup>279</sup> Therefore, ADEQ had the benefit not only of the generally applicable requirements of the RHR, the

<sup>272</sup> See, e.g., 76 FR 34608 (California); 76 FR 42557 (Delaware); 76 FR 80754 (Kansas); 77 FR 19 (New Jersey); 77 FR 5191 (District of Columbia); 77 FR 14604 (Arkansas); 77 FR 17334 (Nevada); 77 FR 24845 (South Dakota); 77 FR 40150 (Nebraska); 77 FR 51915 (New York).

<sup>273</sup> Slip op. at 57.

<sup>274</sup> Arizona Regional Haze SIP, Appendix E, Public Process. Approximately 60 days prior to the public comment period, ADEQ sent a draft of the SIP to the National Park Service and U.S. Forest Service.

<sup>275</sup> *Id.*

<sup>276</sup> *Id.* Letter from Colleen McKaughan, EPA, to Eric Massey, ADEQ (Dec. 2, 2010).

<sup>277</sup> *Id.* NPS Initial Comments Arizona Draft Section 308 Regional Haze SIP (Nov. 29, 2010); NPS General BART Comments on ADEQ BART Analyses (Nov. 29, 2010); NPS Comments AEPSCO—Apache Generating Station BART Analysis and Determination (Nov. 29, 2010); NPS Comments APS Cholla Generating Station BART Analysis and Determination (Nov. 29, 2010); NPS Comments SRP’s Coronado Generating Station BART Analysis and Determination (Nov. 29, 2010); NPS Comments on ADEQ BART Exemptions, (Dec. 1, 2010).

<sup>278</sup> *Id.*

<sup>279</sup> U.S. Forest Service Specific Comments: Arizona Regional Haze SIP (Nov. 29, 2010).

<sup>261</sup> CAA section 307(d)(6)(A) & (B), 42 U.S.C. 7607(d)(6)(A) & (B).

<sup>262</sup> *EME Homer City Generation*, slip op. at 7.

<sup>263</sup> *Id.* at 46.

<sup>264</sup> *Id.* at 47 (emphasis in original).

<sup>265</sup> 64 FR 35714.

<sup>266</sup> 70 FR 39104. This finding covered 37 states, the District of Columbia and the Virgin Islands.

BART Guidelines and EPA Guidance, but also specific guidance from EPA and the FLMs pointing out shortcomings in its Regional Haze SIP. Following receipt of these comments, Arizona had the opportunity to revise its SIP to address the deficiencies identified by the commenters, but in most instances it chose not to do so.<sup>280</sup>

Finally, while we agree that, in the absence of an expired statutory duty and a court-ordered deadline to issue a FIP, it would be preferable for us to give Arizona additional time to revise its Regional Haze SIP prior to promulgation of a FIP, we simply do not have this option under these circumstances. As explained in our response to the previous comment, we are obligated to issue a FIP to address any gaps left by partial disapprovals of Arizona's Regional Haze SIP. Nonetheless, we encourage ADEQ to submit a revised SIP to replace the FIP and will work with ADEQ to develop such a revised plan to meet the requirements of the CAA and the RHR.

*Comment:* One commenter (Earthjustice) stated that the CAA's Regional Haze program establishes a national regulatory floor and requires states to develop RH SIPs at least as stringent as this floor (citing 40 CFR 51.308). According to the commenter, ADEQ's SIP is legally and technically inadequate because it does not require adequate BART emission limits, does not achieve "reasonable progress" are required by the RHR and would fail to achieve natural visibility goals by 2064. The commenter believes that the Arizona RH SIP fails to establish a program that is at least as stringent as the national floor and that therefore EPA has a legal obligation to disapprove the SIP and to issue a FIP in its place under CAA section 110(c)(1).<sup>281</sup>

<sup>280</sup> For example, in response to detailed comments from NPS regarding the efficiency and cost of SCR, ADEQ stated that:

ADEQ has determined that the cost computations presented by the facilities in support of their BART applications are reasonable. Many of the computations are based on vendor data and site-specific conditions. The Department does not agree that the computations over-estimate the costs of retrofit technologies and under-estimate the associated emission decreases and visibility improvement.

<sup>281</sup> The commenter cited *Alaska Dep't of Env'tl. Conservation v. EPA*, 540 U.S. 461, 470, 484 (2004); *Mont. Sulphur & Chem. Co. v. EPA*, 666 F.3d 1174, 1181 (9th Cir. 2012) to support the contention that Congress structured the CAA to provide expansive EPA oversight to ensure SIPs comply with the CAA. The commenter cited 42 U.S.C. 7410(c), (k); *EME Homer City Generation, L.P. v. EPA*, No. 11-1302, \_\_\_ F.3d \_\_\_, 2012 WL 3570721, at \*17 (DC Cir. Aug. 21, 2012) to support the principle that EPA must issue a FIP when it determines that a SIP does not comply with the CAA.

*Response:* We agree that the CAA, the RHR and the BART Guidelines set out specific requirements that Regional Haze SIPs must meet in order to be approved by EPA. Our action today addresses these requirements as they apply to ADEQ's BART determinations for Apache, Cholla and Coronado, but does not address the requirements as they apply to the remainder of Arizona's Regional Haze SIP (e.g., the reasonable progress goals set by the state). EPA will propose action on these aspects of the SIP shortly and take final action after receiving comments. As explained in the preceding responses, because of our prior finding of failure to submit, we are required to issue a FIP for any portion of the SIP that we cannot approve. Thus, we are promulgating a FIP for those aspects of ADEQ's BART determinations for Apache, Cholla and Coronado that we are not approving at this time.

#### G. Other Comments

##### 1. Comment on Public Health and Ecosystem Impacts

*Comment:* A number of commenters provided comments on the potential health effects of our proposal. A number of other commenters stated that the Regional Haze program's sole focus is the improvement of visibility in Class I areas, and is not a health-based or emissions reduction program. In relation to the Regional Haze program, any EPA emphasis on health and emissions reduction is inappropriate. One commenter (SRP) stated that EPA's assertion of health benefits is unsubstantiated by the proposed rule. A few commenters noted that the air quality in Arizona varies from city to city, and stated that EPA should focus on the areas with the poorest air quality first, such as Phoenix.

In contrast, one commenter (Earthjustice) stated that the same pollutants that reduce visibility also cause significant public health impacts. The commenter noted that NO<sub>x</sub> is a precursor to ground level ozone, which is associated with respiratory diseases, asthma attacks and decreased lung function, and that NO<sub>x</sub> reacts with other substances to form particulates that can cause and worsen respiratory diseases, aggravate heart disease, and lead to premature death. The commenter indicated that SO<sub>2</sub> increases asthma symptoms, leads to increased hospital visits, and can form particulates that aggravate respiratory and heart diseases and cause premature death, and that PM can penetrate deep into the lungs and cause health problems such as aggravated asthma, chronic bronchitis, and heart attacks. Based on a report

prepared by the Clean Air Task Force, the commenter asserted that Cholla, Coronado and Apache collectively cause approximately 41 deaths, 63 heart attacks and 747 asthma attacks annually.<sup>282</sup> Several other commenters provided similar comments concerning health effects.

*Response:* We acknowledge the commenters' concerns regarding the adverse health impacts of haze-causing emissions. We agree that the same PM<sub>2.5</sub> emissions that cause visibility impairment can cause respiratory problems, decreased lung function, aggravated asthma, bronchitis, and premature death. We also agree that the same NO<sub>x</sub> 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. Finally, we also agree that SO<sub>2</sub> emissions that cause visibility impairment also contribute to increased asthma symptoms, lead to increased hospital visits, and can form particulates that aggravate respiratory and heart diseases and cause premature death. Thus, to the extent that this FIP will lead to reductions in these pollutants, there will be co-benefits for public health. However, for purposes of this action, we are not authorized to consider these benefits and we have not done so.

In our NPRM, while discussing Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks), we stated that, to the extent the proposed rule will limit emissions of NO<sub>x</sub>, SO<sub>2</sub> and PM<sub>10</sub>, the rule will have a beneficial effect on children's health by reducing air pollution. In this action, while discussing Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks), we conclude that this action does not have a disproportionate effect on children, but again note that to the extent this final action will limit emissions of NO<sub>x</sub>, SO<sub>2</sub> and PM<sub>10</sub>, the rule will have a beneficial effect on children's health by reducing air pollution that causes or exacerbates childhood asthma and other respiratory issues. However, we do not believe it is necessary or appropriate to quantify the extent of this beneficial effect because we are not relying upon health effects in the promulgation of this rule.

*Comment:* One commenter (Earthjustice) stated that the RHR rule

<sup>282</sup> The commenter cited Clean Air Task Force, *Death and Disease From Power Plants*, [http://www.catf.us/fossil/problems/power\\_plants/existing/map.php?state=Arizona](http://www.catf.us/fossil/problems/power_plants/existing/map.php?state=Arizona).

provides important environmental benefits to plants and animals, soil health and entire ecosystems. The commenter noted that NO<sub>x</sub> and SO<sub>2</sub> are the primary causes of acid rain, which acidifies lakes and streams, can damage certain types of trees and soils and accelerates the decay of building materials and paints, including irreplaceable buildings and statues that are part of our nation's cultural heritage. The commenter added that nitrogen deposition, caused by wet and dry deposition of nitrates derived from NO<sub>x</sub> emissions, causes well-known adverse impacts on ecological systems. The commenter also noted that NO<sub>x</sub> is a precursor to ozone, which impacts plants and ecosystems by interfering with plants' ability to produce food and increasing their susceptibility to disease and insects, and also contributes to wildfires and bark beetle outbreaks in the West by depressing plant water levels and growth.

*Response:* We appreciate the commenter's concerns regarding the negative ecosystem impacts of emissions from the units at issue. We agree that both NO<sub>x</sub> and SO<sub>2</sub> cause acid rain and can have negative impacts on ecosystems, damaging plants, trees, and other vegetation (including crop yields), which could have a negative effect on species diversity in our ecosystems. 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 today, we have not taken these potential benefits into account in this action.

## 2. Comments on Economic Impacts

*Comment:* Many commenters, including state officials, private citizens and representatives of local governments, schools, and business groups, expressed concern over potential economic effects resulting from EPA's proposed BART determinations, asserting that EPA's action would result in rate increases and possibly closures of one or more power plants. Some commenters cautioned EPA that rate increases would impact at-risk populations, such as seniors on fixed incomes. The commenters emphasized that the three plants have a large financial impact on the communities where they are located (i.e., they provide jobs and tax revenue) and expressed their concern over the three plants' economic viability if the plants are forced to install SCR to reduce NO<sub>x</sub> emissions. Several representatives of local school districts discussed the harm that large increases

in electric power rates would do to their programs in this time of declining state support, and one representative of a local, nonprofit hospital similarly voiced the difficulty his facility would have in absorbing large rate increases. One commenter discussed the multiplier effect by which loss of income from any job losses or the reduction in disposable income due to increased power bills would ripple through the local economies and affect local businesses and employment. A few commenters discussed the impact on Arizona's water rates, and advised EPA to consider how these rate increases would affect Arizona's economy. A few commenters asserted that the proposed rule is intended to eliminate coal as a cheap and reliable energy source.

By contrast, one commenter (Earthjustice) stated that the RHR provides substantial economic benefits, which far outweigh the costs of pollution control technologies such as SCR. The commenter noted that EPA has valued the RHR's health benefits at \$8.4 to \$9.8 billion annually. The commenter further asserted that requiring power plants to invest in pollution controls creates short-term construction jobs as well as permanent operations and management positions. In addition, the commenter indicated that the national parks and wilderness areas protected by the RHR serve as engines for sustainable local capital, with national park visitors contributing approximately \$30 billion to local economies and supporting 300,000 jobs nationwide. Regarding Arizona specifically, the commenter stated that over 4.3 million people visited the Grand Canyon in 2010, and this supported over 6,800 jobs and resulted in over \$428 million in visitor spending, while tourism at Petrified Forest National Park, Saguaro National Park and Chiricahua National Monument in 2010 supported over 1,100 jobs and resulted in over \$74 million in visitor spending. The commenter contended that studies show that national park visitors highly value clean air, readily perceive haze and are willing to cut short visits to national parks based on their perception of air quality.<sup>283</sup>

*Response:* As explained in our prior responses regarding economic issues, 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." None of the commenters have provided any evidence that our action today would result in the closure of any of the affected units. We discuss many of the potential economic impacts raised as concerns here in the context of our analysis of affordability of controls to AEPCO, above. Finally, we acknowledge that today's action may have positive economic impacts, as described by Earthjustice. However, we have not taken potential economic benefits into account in our action.

## 3. Comments From Tribal Representatives and Members

*Comment:* One commenter (Navajo Nation) stated that comments on our proposed actions were provided pursuant to its government-to-government relationship with EPA. The commenter stated that this EPA rulemaking has adverse implications for a pending BART FIP for Navajo Generating Station, which is on Navajo Nation land and burns Navajo coal. The commenter also stated that this rule could impact BART decisions for Four Corners Power Plant, and San Juan Generating Station.

The commenter states that EPA has an obligation to consult with Navajo Nation on a government-to-government basis for EPA actions and decisions that may affect the Navajo Nation's interests, and reminds EPA that it must defer to tribal government policy decisions, just as it would a state, when promulgating a FIP on tribal lands.

The commenter further states that EPA has failed to analyze the cumulative effects of this rulemaking and the planned and proposed EPA actions on Navajo Generating Station, Four Corners Power Plant, and San Juan Generating Station, including both visibility improvement and potential regional economic impacts. The commenter noted that the fossil fuel economy is vitally important to the Four Corners region and the Navajo Nation, with many jobs and coal royalties at stake from loss of the area's coal fired power plants and their associated mines. The commenter states that EPA must consider these impacts, as well as the impacts of utility rate increases, in this BART decision for NO<sub>x</sub>.

The commenter observed that it is possible to go forward without imposing a FIP in Arizona, as evidenced by the renewed consideration being given to the New Mexico regional haze SIP under the current stay on the proposed FIP for that state. The commenter stated

<sup>283</sup> The commenter cited and submitted as Exhibit 11 Abt Assocs. Inc., Out of Sight: The Science and Economics of Visibility Impairment, at ES-7 (2000), available at <http://www.abtassociates.com/reports/ES-clear.pdf>.

that the Navajo Nation, where two power plants that are undergoing EPA BART determinations are located, shares the concerns of Arizona and New Mexico regarding the economic impacts of requiring SCR. The commenter noted that the BART decision is not based only on the most effective control measures, but is to be based on an analysis of five factors which include non-air quality impacts such as economic impacts.

The commenter also asserted that real data should underpin EPA's decisions, rather than modeling alone. The commenter also contended that a public health baseline is needed in order to chart any public health improvements that result from such emission controls.

*Response:* EPA appreciates the comments provided by the Navajo Nation on our proposed action pursuant to its government-to-government relationship with EPA. As part of separate rulemakings, EPA has engaged in consultation with Navajo Nation regarding the Four Corners Power Plant<sup>284</sup> and San Juan Generating Station. EPA is currently engaged in active consultation with the Navajo Nation and other affected tribes on the Navajo Generating Station.

Today's rule approves Arizona's SIP (in part) and implements a FIP (in part) for Apache Units 2 and 3; Cholla Units 2, 3 and 4; and Coronado Units 1 and 2. This action has no retroactive effect on final BART determinations for other facilities. We disagree that this action has a nexus to the BART determination for Navajo Generating Station, because BART analyses, whether performed by the states or EPA, are conducted on a source-by-source basis, applying all five statutory factors to a facility on an individual basis. While there are certain commonalities among the sources mentioned by the commenter (e.g., all are coal-fired power plants), there are also significant differences that necessarily affect the case-by-case BART analysis. For example, the unit size, unit age, boiler type, existing controls, type of coal burned and proximity to Class I areas vary significantly among these sources. All of these differences have a bearing on at least one of the BART factors and thus on the ultimate BART determination. Given these various distinguishing factors, we do not agree that this rule will affect our BART determination for Navajo Generating Station.

We also do not agree that we are required to consider the cumulative

effects of today's rulemaking together with rulemaking actions on other BART determinations as part of our action today. As noted above, under the CAA, the RHR and the BART Guidelines, BART determinations are made on a source-by-basis, taking into account the five statutory factors. The cumulative improvements from the various SIPs, FIPs, and BART determinations are addressed in analyses under the RHR requirements for Reasonable Progress, Long Term Strategies and future updates to the SIP, which are separate from BART analyses. These cumulative improvements will be influenced by changes in hundreds or thousands of emission sources, so are more appropriately addressed through use of a grid model, such as CAMx or CMAQ, rather than the CALPUFF model recommended in the BART Guidelines, which is geared to a far lower number of sources, and lacks the detailed chemistry of the grid models.

With regard to the economic concerns raised by the commenter, we are required by the CAA and the federal regulations implementing the CAA's BART provisions to 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. As explained in our prior responses regarding economic issues, 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." None of the commenters have provided any evidence that our action today would result in the closure of any of the affected units or result in significant economic disruption. We also note that none of the sources affected by today's rulemaking currently purchase coal from a mine that operates on the Navajo Nation.

We take our duty to estimate the cost of controls very seriously, and make every attempt to make a thoughtful and well informed determination. However, we do not consider a potential increase in electricity rates to be the most appropriate type of analysis for considering the costs of compliance in a BART determination. Projections of electricity rate impacts are inherently fraught with uncertainty due to the numerous variables involved and the complexity of the regulatory regime

governing the power sector. Nevertheless, as discussed elsewhere in this document, as part of our consideration of the affordability of controls on AEPSCO, a small entity, we have analyzed the potential rate increases associated with our proposal for Apache Units 2 and 3. Given the uncertainty inherent in such an analysis, we have used conservative assumptions in an effort to guard against understating the potential rate impacts.

Regarding the comment that EPA should not rely on modeling alone, it is extremely difficult in observational analyses to sufficiently control for all factors, including emissions from other sources, to be able to isolate the impacts of closure of a facility. A model such as CALPUFF essentially holds constant a number of factors in order to isolate the impacts of a single source. As discussed elsewhere in this document, EPA affirms that the regulatory version of CALPUFF is the correct model to use for these BART determinations.

Assessing human exposure and quantifying health benefits are outside the scope of the requirements of the Regional Haze Rule. EPA sets National Ambient Air Quality Standards (NAAQS) to establish levels of air quality that are protective of public health, including the health of sensitive populations, for a number of pollutants including particulate matter. These "sensitive" populations include asthmatics, children, and the elderly. At this time the Navajo Nation is not identified as out of attainment with any of the NAAQS. However, EPA recognizes that there are significant concerns about risk and exposure to air pollutants on the Navajo Nation and EPA will continue discussions with the Navajo Nation and will involve other federal agencies, as appropriate, to help address these concerns.

*Comment:* Various other representatives and members of the Hopi and Navajo Tribes provided oral testimony and/or submitted written comments at one or more of the public hearings. Most tribal community members supported the proposed FIP and stated their belief that it will improve air quality and human health in Arizona. Several commenters recounted their personal experiences with the deterioration of visibility in the rural areas in which they live, declining water supplies due to water use in mining operations, and illnesses that they believe are attributable to air pollution from the power plants and mines in the area (e.g., asthma and bronchitis). A number of commenters pointed out that there are numerous old power plants in and around the Navajo

<sup>284</sup> See document titled: "Timeline of all tribal consultations on BART.docx" in the docket for this final rulemaking.

Nation, which they believe are causing air pollution that contributes to haze and an increase in the incidence of lung and heart disease and cancer in humans, as well as harming native plants and animals. Some of these commenters advocated for a conversion to renewable energy sources, which they believe will provide jobs, improve health, and reduce emissions that contribute to climate change. One commenter specifically suggested that EPA promote alternatives like natural gas and algae ponds as a source of energy.

One commenter indicated that reduced haze would improve tourism, resulting in increased jobs and tax receipts. Another tribal commenter stated that before acting, EPA should evaluate the impact on employment and on the Hopi's revenue from coal if the FIP causes power plants to close.

One tribal commenter alleged that the National Academy of Sciences did a study a number of years ago that concluded that some areas of the country could be designated as "national sacrifice areas" that would be used for national priorities, irrespective of resulting permanent environmental damages. According to the commenter, many Indian reservations are located in such areas, such as all of the Navajo and Hopi reservations. The commenter asserted that the study concluded that the well-being of the people in such areas can be forfeited so that the rest of the country can enjoy cheap energy.

*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. EPA does not intend for this action to cause any power plants to close. 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 determination.

Renewable energy technology is not a retrofit option for the sources subject to BART and is therefore outside the scope of our BART determination. As noted in the BART Guidelines, "[w]e do not consider BART as a requirement to redesign the source when considering available control alternatives. For example, where the source subject to BART is a coal-fired electric generator,

we do not require the BART analysis to consider building a natural gas-fired electric turbine although the turbine may be inherently less polluting on a per unit basis."<sup>285</sup> Therefore, we did not consider such alternatives as part of our BART analyses. Nonetheless, we 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.

The CAA applies equally to all parts of the United States. In making a determination in this case, we have applied the applicable provisions of the CAA and the RHR. We have also considered other applicable requirements, including Executive Order 12898,<sup>286</sup> which establishes federal executive policy on environmental justice. This Executive Order directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that our final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. This rule requires emissions reductions of NO<sub>x</sub> from three facilities in Arizona. The partial approval of the SIP approves state law as meeting Federal requirements.

*Comment:* One commenter suggested that EPA investigate the technology of cooling steam exhaust through a magnetic refrigerator to remove NO<sub>2</sub> as a liquid, since it would condense at the relatively high temperature of 294 K or 70 degrees F (boiling point).

*Response:* The BART Guidelines provide that:

Technologies which have not yet been applied to (or permitted for) full scale operations need not be considered as available; we do not expect the source owner to purchase or construct a process or control

device that has not already been demonstrated in practice.<sup>287</sup>

The Guidelines further provide that:

In order to provide certainty in the process, all technologies should be considered if available before the close of the State's public comment period. You need not consider technologies that become available after this date.

The commenter has not provided evidence that this technology has been demonstrated in practice or that it was available before the close of the State's public comment period. Therefore, we have not considered it as a potential control option. An additional consideration is that typically 90 percent of the NO<sub>x</sub> from combustion is emitted in the form of NO, rather than NO<sub>2</sub>. Since the boiling point of NO is 121 K or -242 degrees F, much lower than for NO<sub>2</sub>, and the stack exit temperature is the range of 300-400 K or 120-280 degrees F, a large degree of cooling would be necessary to condense the NO, and so the energy costs could be substantial.

#### 4. Requests for Extension of Comment Period and Additional Hearings

*Comment:* A number of commenters remarked on EPA's timeline for soliciting public comments, and stated that they believe that the time allowed was insufficient. One commenter requested more public hearings, and another commenter requested a 90-day extension of the deadline for comments (starting from July 18, 2012), so that the public has ample time to review, analyze, comment, and react to the rule and in particular EPA's Technical Support Document. The commenter added that an extension would allow the ADEQ the opportunity to further collaborate with EPA in revising the state's SIP submittal (for the purpose of nullifying the proposed FIP), and thereby adhering to the intent of the CAA.

*Response:* As explained above, our proposed rule, which was signed on July 2, 2012 and published in the **Federal Register** on July 20, 2012,<sup>288</sup> provided for a public hearing in Phoenix, Arizona, on July 31, 2012, and a public comment deadline of August 31, 2012. In response to requests from various parties for a longer comment period and additional hearings, we extended the public comment period to a total of sixty days from publication in the **Federal Register**.<sup>289</sup> We also scheduled two more public hearings in

<sup>285</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.1.

<sup>286</sup> 59 FR 7629, February 16, 1994.

<sup>287</sup> BART Guidelines, 40 CFR Part 51, Appendix Y, section IV.D.1.

<sup>288</sup> 77 FR 42834.

<sup>289</sup> See 77 FR 45326 (July 31, 2012).



Southern Arizona (Benson) and in Northern Arizona (Holbrook) on August 14 and 15, 2012, respectively.

*Comment:* One comment letter signed by 728 residents, business owners, citizens and other interested parties urged EPA to extend the comment period on our proposal and provide additional hearings near the Cholla Power Plant.

*Response:* As noted the preceding response, we extended the comment period on our propose rule and we held additional public hearings, including one in Holbrook, Arizona, near the Cholla Power Plant.

**V. Summary of Final Action**

EPA is taking final action to approve in part and disapprove in part a portion of Arizona’s SIP for Regional Haze and to promulgate a FIP for the disapproved elements of the SIP. This final action addresses only the State’s BART determinations for the specified units at the three power plants. We will propose action on the remainder of Arizona’s Regional Haze SIP in a separate notice. EPA takes very seriously a decision to disapprove portions of a state plan. In this instance, we find that the State’s NO<sub>x</sub> BART determinations for the coal-fired units are not consistent with the requirements of the Act and the RHR. In addition, the SIP lacks the necessary

compliance deadlines and requirements for equipment maintenance and operation, including monitoring, recordkeeping and reporting requirements for all pollutants at all of the BART units. As a result, we find that this final disapproval is the only path that is consistent with the Act at this time.

EPA estimates this action will improve visibility at 18 Class I areas by reducing NO<sub>x</sub> emissions from three power plants by about 22,700 tons per year. The total costs associated with these reductions, according to the supplemental cost analysis we performed based on cost estimates provided by the facility owners, are summarized in Table 18.

TABLE 18—SUMMARY OF SUPPLEMENTAL COST ANALYSIS

	Capital cost (\$)	Annualized capital cost (\$/yr)	Annual O&M (\$/yr)	Total annualized cost (\$/yr)	Cost-effectiveness
Apache Unit 2 .....	\$82,481,439	\$7,785,664	\$1,760,600	\$9,546,264	\$3,450
Apache Unit 3 .....	82,481,439	7,785,664	1,760,600	9,546,264	2,973
Cholla Unit 2 .....	87,713,386	8,279,523	1,626,683	9,906,206	2,979
Cholla Unit 3 .....	83,461,195	7,878,146	1,570,766	9,448,912	2,838
Cholla Unit 4 .....	119,083,832	11,240,671	2,350,182	13,590,853	3,083
Coronado Unit 1 .....	80,633,219	7,611,205	4,492,736	12,103,941	2,135
Coronado Unit 2 .....	2,500,000	235,982	.....	235,982	1,900

**VI. Statutory and Executive Order Reviews**

*A. Executive Order 12866: Regulatory Planning and Review*

This action finalizes approval of a source-specific portion of the Arizona SIP and a Regional Haze FIP for units at three facilities in Arizona. This action is not a rule of general applicability, and not a “significant regulatory action” under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993). This type of action is exempt from review under Executive Order (EO) 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under Executive Order 13563 (76 FR 3821, January 21, 2011).

*B. Paperwork Reduction Act*

This action does not impose an information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. Burden is defined at 5 CFR 1320.3(b). Because this action will finalize approval of a source-specific portion of the Arizona SIP and a Regional Haze FIP for units at only three facilities in Arizona, the Paperwork Reduction Act does not apply. See 5 CFR 1320.3(c). An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it

displays a currently valid Office of Management and Budget (OMB) control number. The OMB control numbers for our regulations in 40 CFR are listed in 40 CFR part 9.

*C. Regulatory Flexibility Act*

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions. For purposes of assessing the impacts of today’s rule on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration’s (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. This action finalizes approval of a source-specific

portion of the Arizona SIP and a Regional Haze FIP for units at three electric generating facilities in Arizona. Firms primarily engaged in the generation, transmission, and/or distribution of electric energy for sale are small if, including affiliates, the total electric output for the preceding fiscal year did not exceed 4 million megawatt hours. Only one of the three facilities affected by this action is a small entity: AEPSCO sold under 3 million megawatt hours in 2011.

Although a regulatory flexibility analysis as specified by the RFA is not required when a rule has impact on only one small entity, EPA estimated the potential impact to AEPSCO of our proposal to require SCR in AEPSCO’s Units 1 and 2. EPA also requested information from AEPSCO on the economics of operating Apache Generating Station and what impact the installation of SCR may have on the economics of operating Apache Generating Station. A summary of the comments regarding the impact of this action on AEPSCO, and EPA’s response to those concerns, is provided in section I.V. of this preamble. After considering the economic impacts of this action on small entities, I certify that this action will not have a significant economic impact on a substantial number of small

entities. The FIP for the three Arizona facilities being issued today does not impose new requirements on a substantial number of small entities because one significantly impacted small entity is not a “substantial” number. Finalizing approval of a source-specific portion of the Arizona Regional Haze SIP merely approves state law as meeting Federal requirements and imposes no additional requirements beyond those imposed by state law. See *Mid-Tex Electric Cooperative, Inc. v. FERC*, 773 F.2d 327 (D.C. Cir. 1985).

#### *D. Unfunded Mandates Reform Act (UMRA)*

Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Under section 202 of UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with “Federal mandates” that may result in expenditures to State, local, and Tribal governments, in the aggregate, or to the private sector, of \$100 million or more (adjusted for inflation) in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and to adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 of UMRA do not apply when they are inconsistent with applicable law. Moreover, section 205 of UMRA allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments, it must have developed under section 203 of UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

Under Title II of UMRA, EPA has determined that this rule does not

contain a Federal mandate that may result in expenditures that exceed the inflation-adjusted UMRA threshold of \$100 million (in 1996 dollars) by State, local, or Tribal governments or the private sector in any 1 year. In addition, this rule does not contain a significant Federal intergovernmental mandate as described by section 203 of UMRA nor does it contain any regulatory requirements that might significantly or uniquely affect small governments.

#### *E. Executive Order 13132: Federalism*

This action does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132, because it addresses the State not fully meeting its obligation to protect visibility established in the CAA and this final action will reduce the emissions of NO<sub>x</sub> from three facilities in Arizona. Thus, Executive Order 13132 does not apply to this action. Although section 6 of Executive Order 13132 does not apply to this action, a summary of the concerns raised by State and local officials, and EPA’s response to those concerns is provided in section I.V. of this preamble.

#### *F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments*

Subject to the Executive Order 13175 (65 FR 67249, November 9, 2000) EPA may not issue a regulation that has tribal implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by tribal governments, or EPA consults with tribal officials early in the process of developing the proposed regulation and develops a tribal summary impact statement. We believe this rule does not have tribal implications, as specified in Executive Order 13175, and will not have substantial direct effects on tribal governments. Thus, Executive Order 13175 does not apply to this rule. However, in our proposal we requested comment on our proposed rule from tribal officials. The Navajo Nation Environmental Protection Agency provided comments on our proposed rule, both orally at a public hearing and by letter, which EPA considered in developing this final rule. EPA’s summary of these comments and our

response to Navajo Nation is provided in section I.V. of this preamble.

#### *G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks*

Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks (62 FR 19885, April 23, 1997), applies to any rule that: (1) Is determined to be economically significant as defined under Executive Order 12866; and (2) concerns an environmental health or safety risk that we have reason to believe may have a disproportionate effect on children. EPA interprets EO 13045 as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the EO has the potential to influence the regulation. This action is not subject to EO 13045 because it implements specific standards established by Congress in statutes. Also, because this action only applies to three sources and is not a rule of general applicability, it is not economically significant as defined under Executive Order 12866, and the rule also does not have a disproportionate effect on children. However, to the extent this action will limit emissions of NO<sub>x</sub>, SO<sub>2</sub>, and PM<sub>10</sub>, the rule will have a beneficial effect on children’s health by reducing air pollution that causes or exacerbates childhood asthma and other respiratory issues.

#### *H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*

This action is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant regulatory action under Executive Order 12866.

#### *I. National Technology Transfer and Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104–113, 12 (10) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards (VCS) in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. VCS are technical standards (e.g., materials specifications, test methods, sampling procedures and business practices) that are developed or adopted by the VCS bodies. The NTTAA directs EPA to provide Congress, through annual reports to OMB, with explanations when the Agency decides not to use available and applicable VCS. The

rulemaking involves technical standards. Therefore, the Agency conducted a search to identify potentially applicable voluntary consensus standards. However, we identified no such standards, and none were brought to our attention in comments. Therefore, EPA has decided to use 40 CFR Part 60 Appendix A Method 5, 40 CFR Part 51 Appendix M Methods 201A/202, 40 CFR Part 60 Appendix A Method 19, and 40 CFR Part 75.

*J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*

Executive Order 12898 (59 FR 7629, February 16, 1994), establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States. EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. This rule requires emissions reductions of NO<sub>x</sub> from three facilities in Arizona. The partial approval of the SIP merely approves state law as meeting Federal requirements and imposes no additional requirements beyond those imposed by state law.

*K. Congressional Review Act*

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. Section 804 exempts from section 801 the following types of rules (1) rules of particular applicability; (2) rules relating to agency management or personnel; and (3) rules of agency organization, procedure, or practice that do not substantially affect the rights or obligations of non-agency

parties. 5 U.S.C. 804(3). EPA is not required to submit a rule report regarding today's action under section 801 because this is a rule of particular applicability and only applies to three facilities.

*L. Petitions for Judicial Review*

Under section 307(b)(1) of the Clean Air Act, petitions for judicial review of this action must be filed in the United States Court of Appeals for the appropriate circuit by February 4, 2013. Filing a petition for reconsideration by the Administrator of this final rule does not affect the finality of this rule for the purposes of judicial review nor does it extend the time within which a petition for judicial review may be filed, and shall not postpone the effectiveness of such rule or action. This action may not be challenged later in proceedings to enforce its requirements. (See CAA section 307(b)(2).)

**List of Subjects in 40 CFR Part 52**

Environmental protection, Air pollution control, Incorporation by reference, Intergovernmental relations, Nitrogen oxides, Sulfur dioxide, Particulate matter, Reporting and recordkeeping requirements, Visibility, Volatile organic compounds.

Dated: November 15, 2012.

**Lisa P. Jackson,**  
*Administrator.*

Part 52, chapter I, title 40 of the Code of Federal Regulations is amended as follows:

**PART 52—APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS**

■ 1. The authority citation for Part 52 continues to read as follows:

*Authority:* 42 U.S.C. 7401 *et seq.*

**Subpart D—Arizona**

■ 2. Section 52.120 is amended by adding paragraph (c)(154) to read as follows:

**§ 52.120 Identification of plan.**

\* \* \* \* \*

(c) \* \* \*

(154) The following plan was submitted February 28, 2011, by the Governor's designee.

- (i) [Reserved]
- (ii) Additional materials.

(A) Arizona Department of Environmental Quality.

(1) Arizona State Implementation Plan, Regional Haze Under Section 308 of the Federal Regional Haze Rule: Appendix D, Arizona BART—Supplemental Information:

(j) Table 1.1—NO<sub>x</sub> BART, entry for AEPCO [Apache], ST1 [Unit 1] only.

(ii) Table 1.2—PM<sub>10</sub> BART, entries for AEPCO [Apache], APS Cholla Power Plant and SRP Coronado Generating Station.

(iii) Table 1.3—SO<sub>2</sub> BART, entries for AEPCO, APS Cholla Power Plant and SRP Coronado Generating Station.

■ 3. Section 52.145 is amended by adding paragraphs (e) and (f) to read as follows:

**§ 52.145 Visibility protection.**

\* \* \* \* \*

(e) *Approval.* On February 28, 2011, the Arizona Department of Environmental Quality submitted the "Arizona State Implementation Plan, Regional Haze Under Section 308 of the Federal Regional Haze Rule" ("Arizona Regional Haze SIP").

(1) With the exception of the NO<sub>x</sub> BART determinations for Units ST2 and ST3 at AEPCO Apache Generating Station; Units 2, 3, and 4 at APS Cholla Power Plant; and Units 1 and 2 at SRP Coronado Generating Station, and the BART compliance provisions for all BART emissions limits at the eight units at the three power plants, the BART determinations for AEPCO Apache Generating Station, APS Cholla Power Plant, and SRP Coronado Generating Station in the Arizona Regional Haze SIP meet the applicable requirements of Clean Air Act sections 169A and 169B and the Regional Haze Rule in 40 CFR 51.301 through 51.308.

(f) *Source-specific federal implementation plan for regional haze at Apache Generating Station, Cholla Power Plant, and Coronado Generating Station* — (1) *Applicability.* This paragraph (f) applies to each owner/operator of the following coal-fired electricity generating units (EGUs) in the state of Arizona: Apache Generating Station, Units 2 and 3; Cholla Power Plant, Units 2, 3, and 4; and Coronado Generating Station, Units 1 and 2. This paragraph (f) also applies to each owner/operator of the following natural gas-fired EGUs in the state of Arizona: Apache Generating Station Unit 1. The provisions of this paragraph (f) are severable, and if any provision of this paragraph (f), or the application of any provision of this paragraph (f) to any owner/operator or circumstance, is held invalid, the application of such provision to other owner/operators and other circumstances, and the remainder of this paragraph (f), shall not be affected thereby.

(2) *Definitions.* Terms not defined below shall have the meaning given to them in the Clean Air Act or EPA's

regulations implementing the Clean Air Act. For purposes of this paragraph (f):

*ADEQ* means the Arizona Department of Environmental Quality.

*Boiler-operating day* means a 24-hour period between 12 midnight and the following midnight during which any fuel is combusted at any time in the unit.

*Coal-fired unit* means any of the EGUs identified in paragraph (f)(1) of this section, except for Apache Generating Station, Unit 1.

*Continuous emission monitoring system* or *CEMS* means the equipment required by 40 CFR Part 75 and this paragraph (f).

*Emissions limitation or emissions limit* means any of the Federal Emission Limitations required by this paragraph (f) or any of the applicable PM<sub>10</sub> and SO<sub>2</sub> emissions limits for Apache Generating Station, Cholla Power Plant, and Coronado Generating Station submitted to EPA as part of the Arizona Regional Haze SIP in a letter dated February 28, 2011, and approved into the Arizona State Implementation Plan on December 5, 2012.

*Flue Gas Desulfurization System* or *FGD* means a pollution control device that employs flue gas desulfurization technology, including an absorber utilizing lime, fly ash, or limestone slurry, for the reduction of sulfur dioxide emissions.

*Group of coal-fired units* mean Units 1 and 2 for Coronado Generating Station; Units 2 and 3 for Apache

Generating Station; and Units 2, 3, and 4 for Cholla Power Plant.

*lb* means pound(s).

*NO<sub>x</sub>* means nitrogen oxides expressed as nitrogen dioxide (NO<sub>2</sub>).

*Owner(s)/operator(s)* means any person(s) who own(s) or who operate(s), control(s), or supervise(s) one or more of the units identified in paragraph (f)(1) of this section.

*MMBtu* means million British thermal unit(s).

*Operating hour* means any hour that fossil fuel is fired in the unit.

*PM<sub>10</sub>* means filterable total particulate matter less than 10 microns and the condensable material in the impingers as measured by Methods 201A and 202.

*Regional Administrator* means the Regional Administrator of EPA Region IX or his/her authorized representative.

*SO<sub>2</sub>* means sulfur dioxide.

*SO<sub>4</sub> removal efficiency* means the quantity of SO<sub>2</sub> removed as calculated by the procedure in paragraph (f)(5)(iii)(B) of this section.

*Unit* means any of the EGUs identified in paragraph (f)(1) of this section.

*Valid data* means data recorded when the CEMS is not out-of-control as defined by Part 75.

(3) *Federal emission limitations.*—(i) *NO<sub>x</sub>* emission limitations. The owner/operator of each coal-fired unit subject to this paragraph (f) shall not emit or cause to be emitted NO<sub>x</sub> in excess of the following limitations, in pounds per million British thermal units (lb/MMBtu) from any group of coal-fired

units. Each emission limit shall be based on a rolling 30-boiler-operating-day average, unless otherwise indicated in specific paragraphs.

Group of coal-fired units	Federal emission limitation
Apache Generating Station Units 2 and 3 .....	0.070
Cholla Power Plant Units 2, 3, and 4 .....	0.055
Coronado Generating Station Units 1 and 2 .....	0.065

(ii) *SO<sub>2</sub> removal efficiency requirement.* The owners/operators of Cholla Power Plant Units 2, 3, and 4 shall achieve and maintain a 30-day rolling average SO<sub>2</sub> removal efficiency of 95 percent at each unit.

(4) *Compliance dates.* (i) The owners/operators of each unit subject to this paragraph (f) shall comply with the NO<sub>x</sub> emissions limitations and other NO<sub>x</sub>-related requirements of this paragraph (f) no later than December 5, 2017.

(ii) The owners/operators of each unit subject to this paragraph (f) shall comply with the applicable PM<sub>10</sub> and SO<sub>2</sub> emissions limits submitted to EPA as part of the Arizona Regional Haze SIP in a letter dated February 28, 2011, and approved into the Arizona State Implementation Plan on December 5, 2012, as well as the related compliance, recordkeeping and reporting of this paragraph (f) no later than the following dates:

Unit	Compliance date	
	PM <sub>10</sub>	SO <sub>2</sub>
Apache Generating Station, Unit 1 .....	June 3, 2013 .....	June 3, 2013.
Apache Generating Station, Unit 2 .....	December 5, 2016 .....	December 5, 2016.
Apache Generating Station, Unit 3 .....	December 5, 2016 .....	December 5, 2016.
Cholla Power Plant, Unit 2 .....	April 1, 2016 .....	April 1, 2016.
Cholla Power Plant, Unit 3 .....	June 3, 2013 .....	June 3, 2013.
Cholla Power Plant, Unit 4 .....	June 3, 2013 .....	June 3, 2013.
Coronado Generating Station, Unit 1 .....	June 3, 2013 .....	June 3, 2013.
Coronado Generating Station, Unit 2 .....	June 3, 2013 .....	June 3, 2013.

(iii) The owners/operators of Cholla Power Plant Units 2, 3 and 4 shall comply with the SO<sub>2</sub> removal efficiency requirement in paragraph (f)(5)(iii)(B) of this section all related compliance, recordkeeping and reporting requirements no later than the following dates:

Cholla Power Plant, Unit 2.	April 1, 2016.
Cholla Power Plant, Unit 3.	December 5, 2013.
Cholla Power Plant, Unit 4.	December 5, 2013.

(5) *Compliance determinations for NO<sub>x</sub> and SO<sub>4</sub>*—(i) *Continuous emission monitoring system.*

(A) At all times after the compliance date specified in paragraph (f)(4) of this section, the owner/operator of each coal-fired unit shall maintain, calibrate, and operate a CEMS, in full compliance with the requirements found at 40 CFR Part 75, to accurately measure SO<sub>2</sub>, NO<sub>x</sub>, diluent, and stack gas volumetric flow rate from each unit. In addition, the owner/operator of Cholla Units 2, 3, and 4 shall calibrate, maintain, and operate a CEMS, in full compliance with

the requirements found at 40 CFR Part 75, to accurately measure SO<sub>2</sub> emissions and diluent at the inlet of the sulfur dioxide control device. Apache Unit 1 NO<sub>x</sub> and diluent CEMS shall be operated to meet the requirements of Part 75. All valid CEMS hourly data shall be used to determine compliance with the emission limitations for NO<sub>x</sub> and SO<sub>2</sub> in paragraph (f)(3) of this section for each unit. When the CEMS is out-of-control as defined by Part 75, that CEMS data shall be treated as missing data and not used to calculate the emission average. Each required

CEMS must obtain valid data for at least 90 percent of the unit operating hours, on an annual basis.

(B) The owner/operator of each unit shall comply with the quality assurance procedures for CEMS found in 40 CFR Part 75. In addition to these Part 75 requirements, relative accuracy test audits shall be calculated for both the NO<sub>x</sub> and SO<sub>2</sub> pounds per hour measurement and the heat input measurement. The CEMs monitoring data shall not be bias adjusted. The inlet SO<sub>2</sub> and diluent monitors required by this rule shall also meet the Quality Assurance/Quality Control (QA/QC) requirements of Part 75. The testing and evaluation of the inlet monitors and the calculations of relative accuracy for lb/hr of NO<sub>x</sub>, SO<sub>2</sub> and heat input shall be performed each time the Part 75 CEMS undergo relative accuracy testing. In addition, relative accuracy test audits shall be performed in the units of lb/MMBtu for the inlet and outlet SO<sub>2</sub> monitors at Cholla Units 2, 3, and 4. Heat input for Apache Unit 1 shall be measured in accordance with Part 75 fuel gas measurement procedures found in 40 CFR Part 75, Appendix D.

(ii) *Compliance determinations for NO<sub>x</sub>*. (A) The 30-day rolling average NO<sub>x</sub> emission rate for each group of coal-fired units shall be calculated for each calendar day, even if a unit is not in operation on that calendar day, in accordance with the following procedure: step one, for each unit, sum the hourly pounds of NO<sub>x</sub> emitted during the current boiler-operating day (or most recent boiler-operating day if the unit is not in operation), and the preceding twenty-nine (29) boiler-operating days, to calculate the total pounds of NO<sub>x</sub> emitted over the most recent thirty (30) boiler-operating day period for each coal-fired unit; step two, for each unit, sum the hourly heat input, in MMBtu, during the current boiler-operating day (or most recent boiler-operating day if the unit is not in operation), and the preceding twenty-nine (29) boiler-operating days, to calculate the total heat input, in MMBtu, over the most recent thirty (30) boiler-operating day period for each coal-fired unit; step 3, sum together the total pounds of NO<sub>x</sub> emitted from the group of coal-fired units over each unit's most recent thirty (30) boiler-operating day period (the most recent 30 boiler-operating day periods for different units may be different); step four, sum together the total heat input from the group of coal-fired units over each unit's most recent thirty (30) boiler-operating day period; and step five, divide the total pounds of NO<sub>x</sub> emitted from step three by the total heat input from step

four for each group of coal-fired units, to calculate the 30-day rolling average NO<sub>x</sub> emission rate for each group of coal-fired units, in pounds of NO<sub>x</sub> per MMBtu, for each calendar day. Each 30-day rolling average NO<sub>x</sub> emission rate shall include all emissions and all heat input that occur during all periods within any boiler-operating day, including emissions from startup, shutdown, and malfunction.

(B) The 30-day rolling average NO<sub>x</sub> emission rate for Apache Unit 1 shall be calculated in accordance with the following procedure: step one, sum the total pounds of NO<sub>x</sub> emitted from the unit during the current boiler-operating day and the previous twenty-nine (29) boiler-operating days; step two, sum the total heat input to the unit in MMBtu during the current boiler-operating day and the previous twenty-nine (29) boiler-operating days; and step three, divide the total number of pounds of NO<sub>x</sub> emitted during the thirty (30) boiler-operating days by the total heat input during the thirty (30) boiler-operating days. A new 30-day rolling average NO<sub>x</sub> emission rate shall be calculated for each new boiler-operating day. Each 30-day rolling average NO<sub>x</sub> emission rate shall include all emissions and all heat input that occur during all periods within any boiler-operating day, including emissions from startup, shutdown, and malfunction.

(C) If a valid NO<sub>x</sub> pounds per hour or heat input is not available for any hour for a unit, that heat input and NO<sub>x</sub> pounds per hour shall not be used in the calculation of the 30-day rolling average.

(iii) *Compliance determinations for SO<sub>2</sub>*. (A) The 30-day rolling average SO<sub>2</sub> emission rate for each coal-fired unit shall be calculated in accordance with the following procedure: Step one, sum the total pounds of SO<sub>2</sub> emitted from the unit during the current boiler-operating day and the previous twenty-nine (29) boiler-operating days; step two, sum the total heat input to the unit in MMBtu during the current boiler-operating day and the previous twenty-nine (29) boiler-operating days; and step three, divide the total number of pounds of SO<sub>2</sub> emitted during the thirty (30) boiler-operating days by the total heat input during the thirty (30) boiler-operating days. A new 30-day rolling average SO<sub>2</sub> emission rate shall be calculated for each new boiler-operating day. Each 30-day rolling average SO<sub>2</sub> emission rate shall include all emissions and all heat input that occur during all periods within any boiler-operating day, including emissions from startup, shutdown, and malfunction.

(B) The 30-day rolling average SO<sub>2</sub> removal efficiency for Cholla Units 2, 3, and 4 shall be calculated as follows: Step one, sum the total pounds of SO<sub>2</sub> emitted as measured at the outlet of the FGD system for the unit during the current boiler-operating day and the previous twenty-nine (29) boiler-operating days as measured at the outlet of the FGD system for that unit; step two, sum the total pounds of SO<sub>2</sub> delivered to the inlet of the FGD system for the unit during the current boiler-operating day and the previous twenty-nine (29) boiler-operating days as measured at the inlet to the FGD system for that unit (for each hour, the total pounds of SO<sub>2</sub> delivered to the inlet of the FGD system for a unit shall be calculated by measuring the ratio of the lb/MMBtu SO<sub>2</sub> inlet to the lb/MMBtu SO<sub>2</sub> outlet and multiplying the outlet pounds of SO<sub>2</sub> by that ratio); step three, subtract the outlet SO<sub>2</sub> emissions calculated in step one from the inlet SO<sub>2</sub> emissions calculated in step two; step four, divide the remainder calculated in step three by the inlet SO<sub>2</sub> emissions calculated in step two; and step five, multiply the quotient calculated in step four by 100 to express as a percentage removal efficiency. A new 30-day rolling average SO<sub>2</sub> removal efficiency shall be calculated for each new boiler-operating day, and shall include all emissions that occur during all periods within each boiler-operating day, including emissions from startup, shutdown, and malfunction.

(C) If a valid SO<sub>2</sub> pounds per hour at the outlet of the FGD system or heat input is not available for any hour for a unit, that heat input and SO<sub>2</sub> pounds per hour shall not be used in the calculation of the 30-day rolling average.

(D) If both a valid inlet and outlet SO<sub>2</sub> lb/MMBtu and an outlet value of lb/hr of SO<sub>2</sub> are not available for any hour, that hour shall not be included in the efficiency calculation.

(6) *Compliance determinations for particulate matter*. Compliance with the particulate matter emission limitation for each coal-fired unit shall be determined from annual performance stack tests. Within sixty (60) days of the compliance deadline specified in paragraph (f)(4) of this section, and on at least an annual basis thereafter, the owner/operator of each unit shall conduct a stack test on each unit to measure PM<sub>10</sub> using EPA Method 5, in 40 CFR part 60, Appendix A, or Method 201A/202 in 40 CFR Part 51, Appendix M. A test protocol shall be submitted to EPA and ADEQ a minimum of 30 days prior to the scheduled testing. The protocol shall identify which method(s)

will be used to demonstrate compliance. Each test shall consist of three runs, with each run at least 120 minutes in duration and each run collecting a minimum sample of 60 dry standard cubic feet. Results shall be reported in lb/MMBtu using the calculation in 40 CFR Part 60 Appendix A Method 19. In addition to annual stack tests, the owner/operator shall monitor particulate emissions for compliance with the emission limitations in accordance with the applicable Compliance Assurance Monitoring (CAM) plan developed and approved in accordance with 40 CFR Part 64. The averaging time for any other demonstration of the PM<sub>10</sub> compliance or exceedance shall be based on a 6-hour average.

(7) *Recordkeeping.* The owner or operator of each unit shall maintain the following records for at least five (5) years:

(i) All CEMS data, including the date, place, and time of sampling or measurement; parameters sampled or measured; and results.

(ii) Daily 30-day rolling emission rates for NO<sub>x</sub> and SO<sub>2</sub> and SO<sub>2</sub> removal efficiency, when applicable, for each unit, calculated in accordance with paragraph (f)(5) of this section.

(iii) Records of quality assurance and quality control activities for emissions measuring systems including, but not limited to, any records required by 40 CFR Part 75.

(iv) Records of the relative accuracy test for hourly NO<sub>x</sub> and SO<sub>2</sub> lb/hr

measurement and hourly heat input measurement.

(v) Records of all major maintenance activities conducted on emission units, air pollution control equipment, and CEMS.

(vi) Any other records required by 40 CFR Part 75.

(8) *Reporting.* All reports and notifications under this paragraph (f) shall be submitted to the Director of Enforcement Division, U.S. EPA Region IX, at 75 Hawthorne Street, San Francisco, CA 94105.

(i) The owner/operator shall notify EPA within two weeks after completion of installation of combustion controls or Selective Catalytic Reactors on any of the units subject to this section.

(ii) Within 30 days after the applicable compliance date(s) in paragraph (f)(4) of this section and within 30 days of every second calendar quarter thereafter (i.e., semi-annually), the owner/operator of each unit shall submit a report that lists the daily 30-day rolling emission rates for NO<sub>x</sub> and SO<sub>2</sub> for each unit and, for Cholla Units 2, 3, and 4, the SO<sub>2</sub> removal efficiency, calculated in accordance with paragraph (f)(5) of this section. Included in this report shall be the results of any relative accuracy test audit performed during the two preceding calendar quarters.

(9) *Enforcement.* Notwithstanding any other provision in this implementation plan, any credible evidence or information relevant as to whether the unit would have been in compliance with applicable requirements if the

appropriate performance or compliance test had been performed, can be used to establish whether or not the owner or operator has violated or is in violation of any standard or applicable emission limit in the plan.

(10) *Equipment operations.* At all times, including periods of startup, shutdown, and malfunction, the owner or operator shall, to the extent practicable, maintain and operate the unit including associated air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emissions. Pollution control equipment shall be designed and capable of operating properly to minimize emissions during all expected operating conditions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Regional Administrator which may include, but is not limited to, monitoring results, review of operating and maintenance procedures, and inspection of the unit.

(11) *Affirmative defense for malfunctions.* The following regulations are incorporated by reference and made part of this federal implementation plan:

(i) R-18-2-101, paragraph 65;

(ii) R18-2-310, sections (A), (B), (D) and (E) only; and

(iii) R18-2-310.01.

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