ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

Douglas A. Ducey
Governor

Misael Cabrera
Director

OCT 2 2 2015

Mr. Jared Blumenfeld
Regional Administrator
U.S. Environmental Protection Agency, Region IX
Mail Code: ORA-1
75 Hawthorne Street
San Francisco, CA 94105

RE: 2015 Revision to the Arizona State Implementation Plan for Regional Haze

Dear Mr. Blumenfeld,

Consistent with the provisions of Arizona Revised Statutes §§ 49-104, 49-106, and 49-404, and the Code of Federal Regulations (CFR) Title 40, §§ 51.102 through 51.104, the Arizona Department of Environmental Quality (ADEQ) hereby adopts and submits to the U.S. Environmental Protection Agency (EPA) the *"Arizona State Implementation Plan Revision to the Arizona Regional Haze Plan for Arizona Public Service Cholla Generating Station"* as a revision to the Arizona State Implementation Plan (SIP).

On February 28, 2011, ADEQ adopted and submitted to EPA, *Arizona's State Implementation Plan for Regional Haze under Section 308 of the Federal Regional Haze Rule.* On December 5, 2012, EPA acted on elements of Arizona's Regional Haze SIP approving its SO_2 and PM_{10} Best Available Retrofit Technology (BART) determinations, disapproving its NO_X BART determination, and establishing a NO_X BART FIP for the three EGUs (77 FR 72511; effective January 4, 2013). That action disapproved a portion of the SIP for Arizona Public Service's (APS) coal-fired BART units located at the Cholla Generating Station (Units 2, 3, and 4). The EPA also promulgated a corresponding Federal Implementation Plan establishing control technology and emission limits for NO_X at the BART units. This SIP revision proposes changes to the BART determinations for APS by shutting down Unit 2 by April 1, 2016, continued operation of Units 3 and 4 with low NOx burners/SOFA with revised NOx emission limits, permanent cessation of coal burning in Units 3 and 4 by April 30, 2025, and imposing new emission limits based on the conversion to natural gas combustion for Units 3 and 4.

The SIP revision consists of copies of the authorizing statutes cited above (Enclosure 1), the SIP Completeness Checklist demonstrating that this submission satisfies the requirements of 40

C.F.R. Part 51 Appendix V (Enclosure 2), and the SIP revisions as described above (Enclosure 3). Two paper copies and an electronic exact duplicate of the hard copy on CD are included with this letter. If you have any questions, please contact me at (602) 771-2288.

Sincerely,

Eric C. Massey, Director
Air Quality Division

cc. Colleen McKaughan, EPA
Tom Webb, EPA

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Douglas A. Ducey
Governor

Misael Cabrera
Director

August 17, 2015

TO: Eric Massey
Division Director
Air Quality Division

Under A.R.S. §49-104(D)(2), I authorize you, Eric Massey, Division Director, Air Quality Division, Arizona Department of Environmental Quality, to perform any act, including execution of any pertinent documents, which I as Director of the Arizona Department of Environmental Quality am authorized or required to do by law with respect to A.R.S. Title 49, chapters 1 and 3 and any other acts relating to air quality including personnel actions.

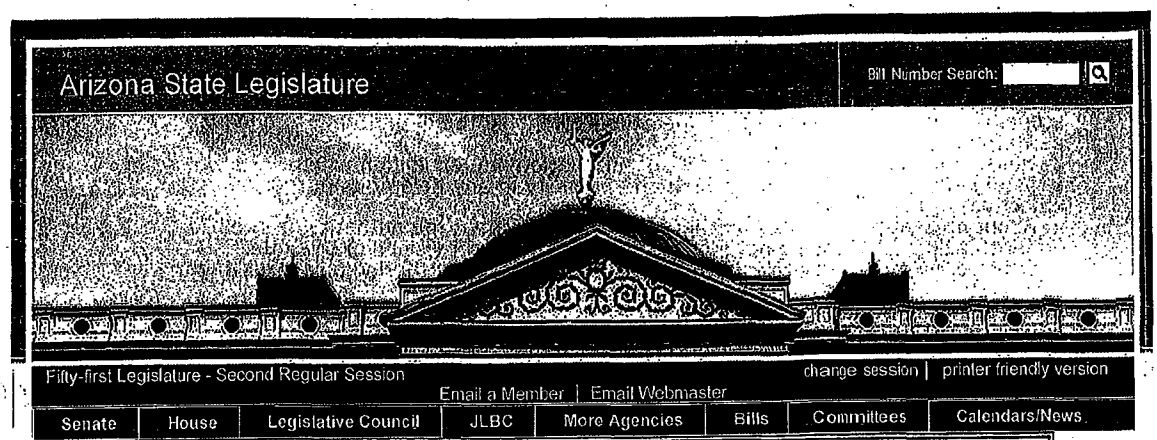
This authority shall remain in effect until it is revoked or upon your separation from the Arizona Department of Environmental Quality. You may further delegate this authority in the best interest of the agency, however, those delegations must be in writing and you must forward a copy of any further delegations to me.

This delegation is effective August 17, 2015, and revokes all earlier delegations. I ratify all acts performed by you as Air Quality Division Director concerning the duties and functions in this delegation letter.

Misael Cabrera
Director

ENCLOSURE 1

Arizona Revised Statutes §§ 49-104, 49-106, 49-404



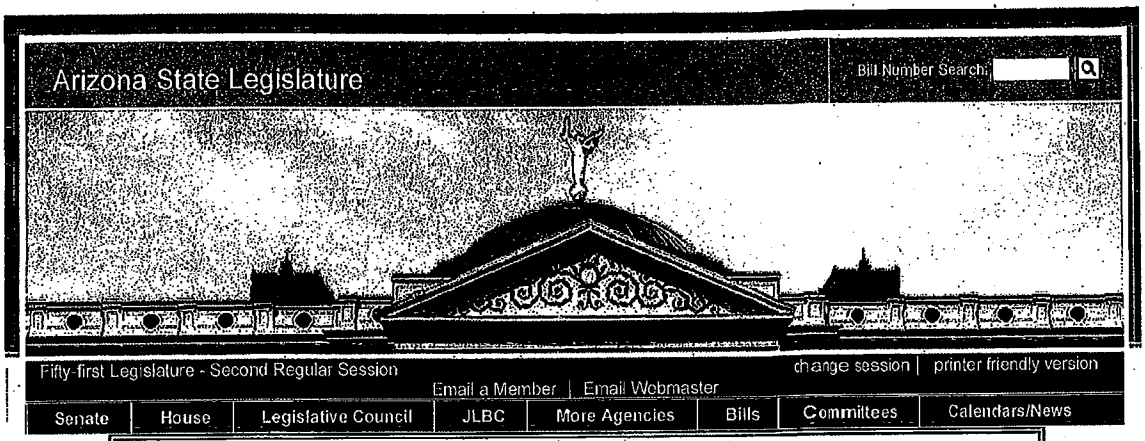
49-104. Powers and duties of the department and director

A. The department shall:

1. Formulate policies, plans and programs to implement this title to protect the environment.
2. Stimulate and encourage all local, state, regional and federal governmental agencies and all private persons and enterprises that have similar and related objectives and purposes, cooperate with those agencies, persons and enterprises and correlate department plans, programs and operations with those of the agencies, persons and enterprises.
3. Conduct research on its own initiative or at the request of the governor, the legislature or state or local agencies pertaining to any department objectives.
4. Provide information and advice on request of any local, state or federal agencies and private persons and business enterprises on matters within the scope of the department.
5. Consult with and make recommendations to the governor and the legislature on all matters concerning department objectives.
6. Promote and coordinate the management of air resources to assure their protection, enhancement and balanced utilization consistent with the environmental policy of this state.
7. Promote and coordinate the protection and enhancement of the quality of water resources consistent with the environmental policy of this state.
8. Encourage industrial, commercial, residential and community development that maximizes environmental benefits and minimizes the effects of less desirable environmental conditions.
9. Assure the preservation and enhancement of natural beauty and man-made scenic qualities.
10. Provide for the prevention and abatement of all water and air pollution including that related to particulates, gases, dust, vapors, noise, radiation, odor, nutrients and heated liquids in accordance with article 3 of this chapter and chapters 2 and 3 of this title.
11. Promote and recommend methods for the recovery, recycling and reuse or, if recycling is not possible, the disposal of solid wastes consistent with sound health, scenic and environmental quality policies. Beginning in 2014, the department shall report annually on its revenues and expenditures relating to the solid and hazardous waste programs overseen or administered by the department.
12. Prevent pollution through the regulation of the storage, handling and transportation of solids, liquids and gases that may cause or contribute to pollution.
13. Promote the restoration and reclamation of degraded or despoiled areas and natural resources.
14. Assist the department of health services in recruiting and training state, local and district health department personnel.
15. Participate in the state civil defense program and develop the necessary organization and facilities to meet wartime or other disasters.
16. Cooperate with the Arizona-Mexico commission in the governor's office and with researchers at universities in this state to collect data and conduct projects in the United States and Mexico on issues that are within the scope of the department's duties and that relate to quality of life, trade and economic development in this state in a manner that will help the Arizona-Mexico commission to assess and enhance the economic competitiveness of this state and of the Arizona-Mexico region.
17. Unless specifically authorized by the legislature, ensure that state laws, rules, standards, permits, variances and orders are adopted and construed to be consistent with and no more stringent than the corresponding federal law that addresses the same subject matter. This provision shall not be construed to adversely affect standards adopted by an Indian tribe under federal law.

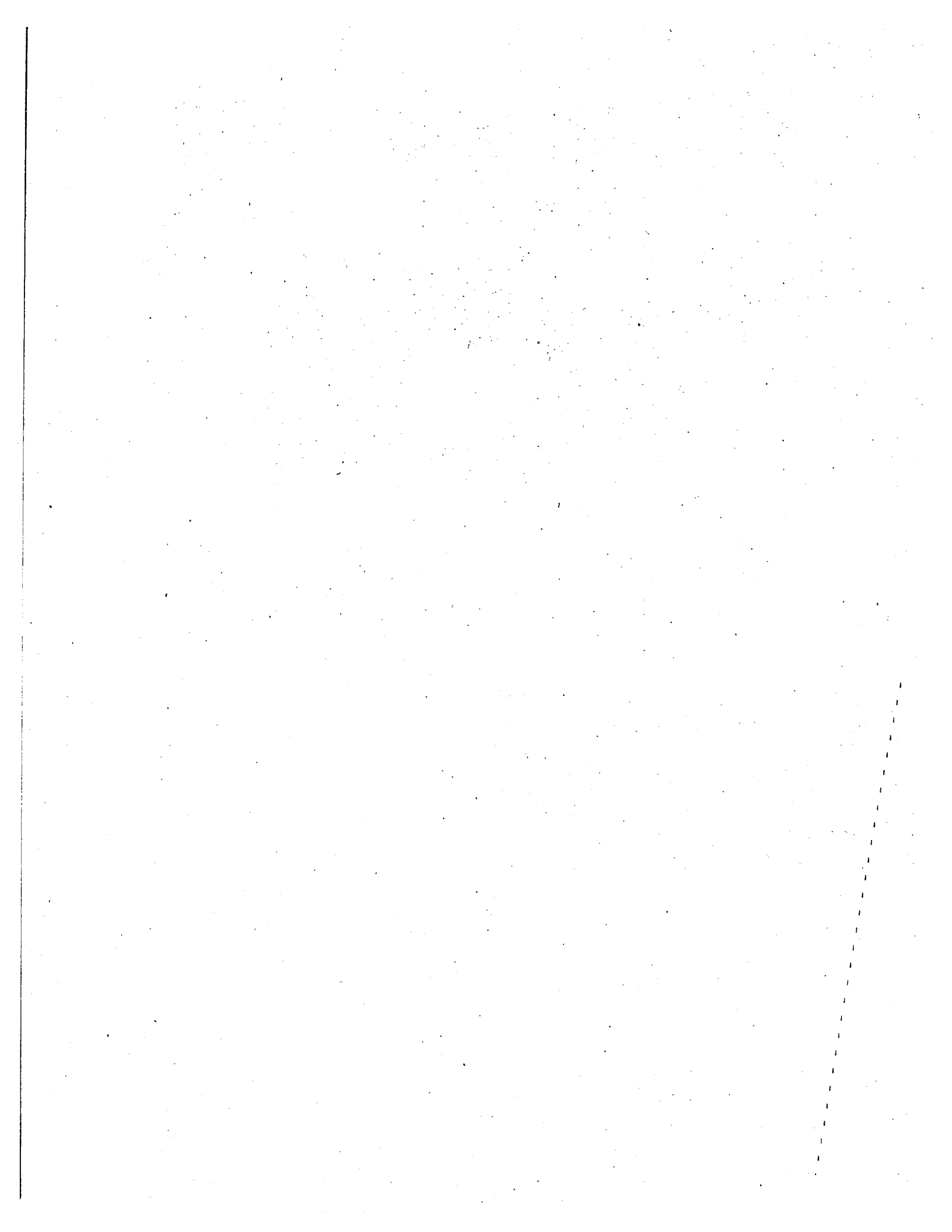
B. The department, through the director, shall:
1. Contract for the services of outside advisers, consultants and aides reasonably necessary or desirable to enable the department to adequately perform its duties.
2. Contract and incur obligations reasonably necessary or desirable within the general scope of department activities and operations to enable the department to adequately perform its duties.
3. Utilize any medium of communication, publication and exhibition when disseminating information, advertising and publicity in any field of its purposes, objectives or duties.
4. Adopt procedural rules that are necessary to implement the authority granted under this title, but that are not inconsistent with other provisions of this title.
5. Contract with other agencies, including laboratories, in furthering any department program.
6. Use monies, facilities or services to provide matching contributions under federal or other programs that further the objectives and programs of the department.
7. Accept gifts, grants, matching monies or direct payments from public or private agencies or private persons and enterprises for department services and publications and to conduct programs that are consistent with the general purposes and objectives of this chapter. Monies received pursuant to this paragraph shall be deposited in the department fund corresponding to the service, publication or program provided.
8. Provide for the examination of any premises if the director has reasonable cause to believe that a violation of any environmental law or rule exists or is being committed on the premises. The director shall give the owner or operator the opportunity for its representative to accompany the director on an examination of those premises. Within forty-five days after the date of the examination, the department shall provide to the owner or operator a copy of any report produced as a result of any examination of the premises.
9. Supervise sanitary engineering facilities and projects in this state, authority for which is vested in the department, and own or lease land on which sanitary engineering facilities are located, and operate the facilities, if the director determines that owning, leasing or operating is necessary for the public health, safety or welfare.
10. Adopt and enforce rules relating to approving design documents for constructing, improving and operating sanitary engineering and other facilities for disposing of solid, liquid or gaseous deleterious matter.
11. Define and prescribe reasonably necessary rules regarding the water supply, sewage disposal and garbage collection and disposal for subdivisions. The rules shall:
(a) Provide for minimum sanitary facilities to be installed in the subdivision and may require that water systems plan for future needs and be of adequate size and capacity to deliver specified minimum quantities of drinking water and to treat all sewage.
(b) Provide that the design documents showing or describing the water supply, sewage disposal and garbage collection facilities be submitted with a fee to the department for review and that no lots in any subdivision be offered for sale before compliance with the standards and rules has been demonstrated by approval of the design documents by the department.
12. Prescribe reasonably necessary measures to prevent pollution of water used in public or semipublic swimming pools and bathing places and to prevent deleterious conditions at such places. The rules shall prescribe minimum standards for the design of and for sanitary conditions at any public or semipublic swimming pool or bathing place and provide for abatement as public nuisances of premises and facilities that do not comply with the minimum standards. The rules shall be developed in cooperation with the director of the department of health services and shall be consistent with the rules adopted by the director of the department of health services pursuant to section 36-136, subsection H, paragraph 10.
13. Prescribe reasonable rules regarding sewage collection, treatment, disposal and reclamation systems to prevent the transmission of sewage borne or insect borne diseases. The rules shall:
(a) Prescribe minimum standards for the design of sewage collection systems and treatment, disposal and reclamation systems and for operating the systems.
(b) Provide for inspecting the premises, systems and installations and for abating as a public nuisance any collection system, process, treatment plant, disposal system or reclamation system that does not comply with the minimum standards.
(c) Require that design documents for all sewage collection systems, sewage collection system extensions, treatment plants, processes, devices, equipment, disposal systems, on-site wastewater treatment facilities and reclamation systems be submitted with a fee for review to the department and may require that the design documents anticipate and provide for future sewage treatment needs.
(d) Require that construction, reconstruction, installation or initiation of any sewage collection system, sewage collection system extension, treatment plant, process, device, equipment, disposal system, on-site wastewater treatment facility or reclamation system conform with applicable requirements.
14. Prescribe reasonably necessary rules regarding excreta storage, handling, treatment, transportation and disposal. The rules shall:
(a) Prescribe minimum standards for human excreta storage, handling, treatment, transportation and disposal and shall provide for inspection of premises, processes and vehicles and for abating as public nuisances any premises, processes or vehicles

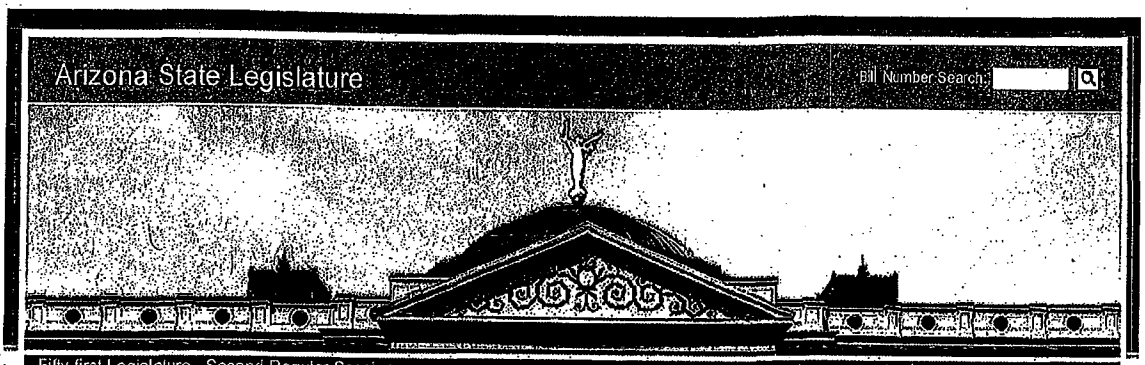
that do not comply with the minimum standards.
(b) Provide that vehicles transporting human excreta from privies, septic tanks, cesspools and other treatment processes shall be licensed by the department subject to compliance with the rules. The department may require payment of a fee as a condition of licensure. After the effective date of this amendment to this section, the department shall establish by rule a fee as a condition of licensure, including a maximum fee. As part of the rule making process, there must be public notice and comment and a review of the rule by the joint legislative budget committee. After September 30, 2013, the department shall not increase that fee by rule without specific statutory authority for the increase. The fees shall be deposited, pursuant to sections 35-146 and 35-147, in the solid waste fee fund established by section 49-881.
15. Perform the responsibilities of implementing and maintaining a data automation management system to support the reporting requirements of title III of the superfund amendments and reauthorization act of 1986 (P.L. 99-499) and title 26, chapter 2, article 3.
16. Approve remediation levels pursuant to article 4 of this chapter.
17. Establish or revise fees by rule pursuant to the authority granted under title 44, chapter 9, article 8 and chapters 4 and 5 of this title for the department to adequately perform its duties. All fees shall be fairly assessed and impose the least burden and cost to the parties subject to the fees. In establishing or revising fees, the department shall base the fees on:
(a) The direct and indirect costs of the department's relevant duties, including employees salaries and benefits, professional and outside services, equipment, in-state travel and other necessary operational expenses directly related to issuing licenses as defined in title 41, chapter 6 and enforcing the requirements of the applicable regulatory program.
(b) The availability of other funds for the duties performed.
(c) The impact of the fees on the parties subject to the fees.
(d) The fees charged for similar duties performed by the department, other agencies and the private sector.
C. The department may:
1. Charge fees to cover the costs of all permits and inspections it performs to ensure compliance with rules adopted under section 49-203, except that state agencies are exempt from paying the fees. Monies collected pursuant to this subsection shall be deposited, pursuant to sections 35-146 and 35-147, in the water quality fee fund established by section 49-210.
2. Contract with private consultants for the purposes of assisting the department in reviewing applications for licenses, permits or other authorizations to determine whether an applicant meets the criteria for issuance of the license, permit or other authorization. If the department contracts with a consultant under this paragraph, an applicant may request that the department expedite the application review by requesting that the department use the services of the consultant and by agreeing to pay the department the costs of the consultant's services. Notwithstanding any other law, monies paid by applicants for expedited reviews pursuant to this paragraph are appropriated to the department for use in paying consultants for services.
D. The director may:
1. If the director has reasonable cause to believe that a violation of any environmental law or rule exists or is being committed, inspect any person or property in transit through this state and any vehicle in which the person or property is being transported and detain or disinfect the person, property or vehicle as reasonably necessary to protect the environment if a violation exists.
2. Authorize in writing any qualified officer or employee in the department to perform any act that the director is authorized or required to do by law.



49-106. Statewide application of rules

The rules adopted by the department apply and shall be observed throughout this state, or as provided by their terms, and the appropriate local officer, council or board shall enforce them. This section does not limit the authority of local governing bodies to adopt ordinances and rules within their respective jurisdictions if those ordinances and rules do not conflict with state law and are equal to or more restrictive than the rules of the department, but this section does not grant local governing bodies any authority not otherwise provided by separate state law.





49-404. State implementation plan

A. The director shall maintain a state implementation plan that provides for implementation, maintenance and enforcement of national ambient air quality standards and protection of visibility as required by the clean air act.

B. The director may adopt rules that describe procedures for adoption of revisions to the state implementation plan.

C. The state implementation plan and all revisions adopted before September 30, 1992 remain in effect according to their terms, except to the extent otherwise provided by the clean air act, inconsistent with any provision of the clean air act, or revised by the administrator. No control requirement in effect, or required to be adopted by an order, settlement agreement or plan in effect, before the enactment of the clean air act in any area which is a nonattainment or maintenance area for any air pollutant may be modified after enactment in any manner unless the modification insures equivalent or greater emission reductions of the air pollutant. The director shall evaluate and adopt revisions to the plan in conformity with federal regulations and guidelines promulgated by the administrator for those purposes until the rules required by subsection B are effective.

ENCLOSURE 2

State Implementation Plan Completeness Checklist

STATE IMPLEMENTATION PLAN COMPLETENESS CHECKLIST

Submittal of

Arizona Regional Haze State Implementation Plan Revision for Arizona Public Service, Cholla Generating Station, October 2015

40 CFR Part 51, Appendix V, *Criteria for Determining the Completeness of Plan Submissions*, contains the "minimum criteria for determining whether a State Implementation Plan submitted for consideration by EPA is an official submission for purposes of review under § 51.103," *Submission of plans, preliminary review of plans.* Appendix V requires the following to be included in plan submissions for review by EPA:

Administrative Materials

1. "A formal letter of submittal from the Governor or his designee, requesting EPA approval of the plan or revision thereof (hereafter ''the plan'')." [Appendix V, 2.1(a)]

   See cover letter.

2. "Evidence that the State has adopted the plan in the State code or body of regulations; or issued the permit, order, consent agreement (hereafter ''document'') in final form. That evidence shall include the date of adoption or final issuance as well as the effective date of the plan, if different from the adoption/issuance date." [Appendix V, 2.1(b)]

   See cover letter.

3. "Evidence that the State has the necessary legal authority under State law to adopt and implement the plan." [Appendix V, 2.1(c)]

   See Enclosure 1.

4. "A copy of the actual regulation, or document submitted for approval and incorporation by reference into the plan, including indication of the changes made (such as, redline/strikethrough) to the existing approved plan, where applicable ..." [Appendix V, 2.1(d)]

   See Enclosure 3.

5. "Evidence that the State followed all of the procedural requirements of the State's laws and constitution in conducting and completing the adoption/issuance of the plan." [Appendix V, 2.1(e)]

   See cover letter and Enclosure 3, Appendix F.

6. "Evidence that public notice was given of the proposed change consistent with procedures approved by EPA, including the date of publication of such notice." [Appendix V, 2.1(f)]

   See Enclosure 3, Appendix F.

7. "Certification that public hearing(s) were held in accordance with the information provided in the public notice and the State's laws and constitution, if applicable and consistent with the public hearing requirements in 40 CFR 51.102." [Appendix V, 2.1(g)]

   See Enclosure 3, Appendix F.

8. "Compilation of public comments and the State's response thereto." [Appendix V, 2.1(h)]

   See Enclosure 3, Appendix F.

Technical Support

9. "Identification of all regulated pollutants affected by the plan." [Appendix V, 2.2(a)]

   Nitrogen Oxides.

10. "Identification of the locations of affected sources including the EPA attainment/nonattainment designation of the locations and the status of the attainment plan for the affected areas(s)." [Appendix V, 2.2(b)]

    See Enclosure 3, Chapter 3.

11. "Quantification of the changes in plan allowable emissions from the affected sources; estimates of changes in current actual emissions from affected sources or, where appropriate, quantification of changes in actual emissions from affected sources through calculations of the differences between certain baseline levels and allowable emissions anticipated as a result of the revision." [Appendix V, 2.2(c)]

    See Enclosure 3, Chapter 2 and 3.

12. "The State's demonstration that the national ambient air quality standards, prevention of significant deterioration increments, reasonable further progress demonstration, and visibility, as applicable, are protected if the plan is approved and implemented. For all requests to redesignate an area to attainment for a national primary ambient air quality standard, under section 107 of the Act, a revision must be submitted to provide for the maintenance of the national primary ambient air quality standards for at least 10 years as required by section 175A of the Act." [Appendix V, 2.2(d)]

    See Enclosure 3, Chapter 3.

13. "Modeling information required to support the proposed revision, including input data, output data, models used, justification of model selections, ambient monitoring data used, meteorological data used, justification for use of offsite data (where used), modes of models used, assumptions, and other information relevant to the determination of adequacy of the modeling analysis." [Appendix V, 2.2(e)]

    See Enclosure 3, Chapter 2.

14. "Evidence, where necessary, that emission limitations are based on continuous emission reduction technology." [Appendix V, 2.2(f)]

    See Enclosure 3, Chapter 2.

15. "Evidence that the plan contains emission limitations, work practice standards and recordkeeping/reporting requirements, where necessary, to ensure emission levels." [Appendix V, 2.2(g)]

    See Enclosure 3, Appendix A.

16. "Compliance/enforcement strategies, including how compliance will be determined in practice." [Appendix V, 2.2(h)]

    See Enclosure 3, Appendix A.

17. "Special economic and technological justifications required by any applicable EPA policies, or an explanation of why such justifications are not necessary." [Appendix V, 2.2(i)]

    See Enclosure 3, Chapter 2.

ENCLOSURE 3

Arizona State Implementation Plan Revision

Revision to the Arizona Regional Haze Plan for Arizona Public Service Cholla Generating Station

October 2015

ADEQ
Arizona Department
of Environmental Quality

Arizona State Implementation Plan

Revision to the Arizona Regional Haze Plan for Arizona Public Service Cholla Generating Station

Air Quality Division
October 2015

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

The Arizona Department of Environmental Quality ("ADEQ") is proposing a source-specific revision to the Arizona State Regional Haze Implementation Plan ("Arizona RH SIP") that establishes best available retrofit technology ("BART") for Steam Units 2, 3, and 4 at Arizona Public Service Company's ("APS") Cholla Generating Station ("Cholla"). The revision is intended to replace elements of Arizona RH SIP pertaining to Cholla. The revision reflects the five- factor BART Reassessment for Cholla ("Cholla BART Reassessment" due to changes in circumstances affecting the BART determination.

As required, this document includes a technical analysis of the Five-Factor BART Reassessment for Cholla and a demonstration that this revision will not interfere with the ability of the program area to attain/maintain the National Ambient Air Quality Standards ("NAAQS") or any other requirement of the Clean Air Act ("CAA").

1.2 Regulatory Background

On February 28, 2011, ADEQ submitted a Regional Haze SIP under 40 CFR § 51.308 to the U.S. Environmental Protection Agency ("EPA" or "Agency"), which became complete as a matter of law. Several parties, including the Sierra Club and Grand Canyon Trust, filed a complaint in August 2011 for declaratory and injunctive relief in the United States Court of Appeals for the D.C. Circuit. The parties sought to compel EPA to perform a nondiscretionary duty of not approving various Regional Haze SIPs, including Arizona, or promulgating a Federal Implementation Plan ("FIP").

On November 9, 2011, EPA announced its intention to enter into a consent decree with the plaintiffs, which was granted on March 30, 2012. The decree included a court-ordered schedule to review and act on more than 40 state regional haze plans. The scheduled deadlines were administratively extended in May 2012, which allowed EPA to separate its actions on BART applicable to electric generating units ("EGUs") from the remaining components of the SIP.

EPA and the plaintiffs submitted a motion on June 14, 2012, to extend the deadlines for both actions as required by the consent decree. Even though Arizona opposed this motion, the United States Court of Appeals for the D.C. Circuit upheld the revised consent decree, setting dates for proposed action on the EGU BART portion of Arizona's SIP due by July 12, 2012, and remaining portions of the SIP due by December 8, 2012. Final action on the EGU BART portion of the SIP was required on or before November 15, 2012, and final action on the remainder of the SIP was required on or before July 15, 2013. Final action for the utility portion of the SIP was required on or before November 15, 2012, and final action for the balance of the SIP was required on or before July 15, 2013.

On July 20, 2012, EPA published a notice of proposed rule-making ("NPRM") that proposed partial approval and partial disapproval of Arizona's EGU BART determinations and a proposed EPA FIP.[1] This proposed rule was finalized on December 5, 2012, when EPA published a NFRM approving Arizona's SO_2 BART determination, disapproving its NO_X BART determination, and establishing a NO_X BART FIP for the three power plants impacted by the rule, which became effective January 4, 2013.[2]

On January 31, 2013, the State of Arizona filed a Petition for Review challenging the EPA's FIP

[1] 77 Fed. Reg. 42834 (July 20, 2012).
[2] 77 Fed. Reg. 72511 (Dec. 5, 2012)[hereinafter EPA Final Rule].

before the United States Court of Appeals for the Ninth Circuit. APS and PacifiCorp subsequently filed Petitions for Review of the same EPA final action. Briefing on the matter has completed, and oral argument was held on March 9, 2015.

On September 9, 2014, APS and PacifiCorp met with the ADEQ and EPA Region 9 to discuss a proposed BART Reassessment for Cholla that would resolve the litigation and result in greater long-term environmental benefits and be more cost-effective than EPA's BART determination. At this meeting, EPA indicated its belief that APS and PacifiCorp's BART Reassessment had sufficient merit to warrant a formal proposal for the Agency's consideration.

On January 15, 2015, APS and PacifiCorp submitted an Application for Significant Permit Revision and Five-Factor BART Reassessment for Cholla to ADEQ. In this submittal, APS and PacifiCorp requested ADEQ to adopt the BART Reassessment as a proposed revision to the Arizona Regional Haze SIP and to submit the revision to EPA for approval. To address some of ADEQ's comments, APS and PacifiCorp revised and resubmitted the application on March 12, 2015.

2.0 REVISION TO ARIZONA'S REGIONAL HAZE PROGRAM - 2015

2.1 Summary of Control Strategy Changes at Cholla

Cholla consists of four primarily coal-fired EGUs with a total plant-wide generating capacity of 1,180 gross megawatts (MW). Unit 1 is a 126 gross MW tangentially-fired, dry-bottom boiler that is not BART-eligible. Units 2, 3, and 4 have capacities of 272, 272, and 410 gross MW, respectively, and are tangentially-fired, dry-bottom boilers that are each BART-eligible (collectively "Cholla BART Units"). Units 1, 2, and 3 are owned and operated by APS, and Unit 4 is owned by PacifiCorp and operated by APS.

Effective January 4, 2013, EPA approved a portion of Arizona's RH SIP for the Cholla BART Units, establishing emissions limits for PM_{10} and SO_2.[3] In the same action, EPA disapproved a portion of the SIP for the Cholla BART Units and promulgated a corresponding FIP, which establishes control technology requirements and emission limits for NOx.[4] The FIP imposes an emission limit for NOx of 0.055 lb/MMBtu determined as an average of the Cholla BART Units, based on a rolling 30-boiler-operating-day average.[5] The final compliance date to install and operate selective catalytic reduction ("SCR") emission controls on the Cholla BART Units is December 5, 2017.[6] In addition, the FIP imposes a new SO_2 removal efficiency requirement of 95 percent for the scrubbers on the Cholla BART Units.[7] Cholla Units 3 and 4 were required to achieve this removal efficiency by December 5, 2013, and Cholla Unit 2 must comply by April 1, 2016.[8]

To meet the requirements of the regional haze program and act in the best interests of their respective customers, APS and PacifiCorp evaluated an alternative set of control strategies, including:

- Permanently shut down Cholla BART Unit 2 by April 1, 2016;
- Operate Cholla BART Units 3 and 4 with the currently installed low NOx burners ("LNB") with separated over-fired air ("SOFA"); and

[3] *EPA Final Rule*, at 72514.
[4] *Id.*
[5] *Id.*
[6] *Id.*, at 72515.
[7] *Id.*, at 72514.
[8] *Id.*, at 72515.

- Cease burning coal at Cholla BART Units 3 and 4 by April 30, 2025 with the option to convert to pipeline-quality natural gas by July 31, 2025 with a ≤ 20 percent annual average capacity factor.

Upon reviewing the proposal and associated supporting documents from APS and PacifiCorp, ADEQ is proposing a source-specific revision to the Arizona RH SIP that establishes BART for Steam Units 2, 3, and 4 at Cholla. The revision is as follows:

Steam Unit 2

This SIP revision proposes to permanently shut down Cholla Unit 2 by April 1, 2016.

Steam Unit 3

This SIP revision proposes to operate Cholla Unit 3 with the currently installed LNB with SOFA. Additionally, this revision proposes to permanently cease burning coal at Unit 3 by April 30, 2025 with the option to convert to pipeline natural gas by July 31, 2025 with a ≤ 20% annual average capacity factor. The NOx emission limit will be revised from 0.055 lb/MMBtu (EPA FIP) to 0.22 lb/MMBtu (burning coal) or 0.08 lb/MMBtu (burning natural gas), based on a 30-boiler-operating-day average.

Steam Unit 4

This SIP revision proposes to operate Cholla Unit 4 with the currently installed LNB with SOFA. Additionally, this revision proposes to permanently cease burning coal at Unit 4 by April 30, 2025 with the option to convert to pipeline natural gas by July 31, 2025 with a ≤ 20% annual average capacity factor. The NOx emission limit will be revised from 0.055 lb/MMBtu (EPA FIP) to 0.22 lb/MMBtu (burning coal) or 0.08 lb/MMBtu (burning natural gas), based on a 30-boiler-operating-day average.

Although not a BART-eligible unit, APS also proposes to cease burning coal at Cholla Unit 1 by April 30, 2025 with an option to convert to pipeline-quality natural gas in 2025 to provide added visibility benefits.

Table 1 provides the proposed emission limits and compliance dates for Cholla. The new control strategies and compliance methods are incorporated as Appendix A to the facility's Operating Permit.[9]

[9] Significant Permit Revision No. 61713, Operating Permit No. 53399.

Table 1 Summary of Proposed Emission Limits and Compliance Dates for Cholla (lb/MMBtu)

Cholla Unit	NOx	SO_2	PM_{10}	Action
Unit 2	0.30 lb/MMBtu	0.25 lb/MMBtu and 90 percent removal efficiency	0.025 lb/MMBtu	Permanently shut down by April 1, 2016
Unit 3	0.22 lb/MMBtu	0.15 lb/MMBtu and 95 percent removal efficiency	0.015 lb/MMBtu	Permanently cease burning coal by April 30, 2025 with the option to convert to pipeline natural gas by July 31, 2025 with a ≤ 20% annual average capacity factor
	0.08 lb/MMBtu if converted to pipeline natural gas	0.0006 lb/MMBtu if converted to pipeline natural gas	0.01 lb/MMBtu if converted to pipeline natural gas	
Unit 4	0.22 lb/MMBtu	0.15 lb/MMBtu and 95 percent removal efficiency	0.015 lb/MMBtu	Permanently cease burning coal by April 30, 2025 with the option to convert to pipeline natural gas by July 31, 2025 with a ≤ 20% annual average capacity factor
	0.08 lb/MMBtu if converted to pipeline natural gas	0.0006 lb/MMBtu if converted to pipeline natural gas	0.01 lb/MMBtu if converted to pipeline natural gas	

2.2 Technical Analysis of Cholla BART Reassessment

ADEQ has identified two circumstances that would warrant a BART reassessment for Cholla: (i) shutdown of Unit 2 by April 1, 2016, and (ii) conversion to natural gas-firing at Units 3 and 4 by April 30, 2025. No BART determination for Unit 2 is required because the enforceable shutdown date is within the five-year BART window. Moreover, the proposed conversion to natural gas-firing at Units 3 and 4 will significantly affect the cost effectiveness analysis and consequently the BART determination for Units 3 and 4. Therefore, APS and PacifiCorp conducted the Five-Factor BART Reassessment for Cholla Units 3 and 4 based on the alternative controls they proposed.

2.2.1 BART Factor 1 – Cost of Compliance

The Cholla BART Reassessment addressed the cost of compliance for the following control options:

- LNB and SOFA;
- SNCR with LNB and SOFA; and
- SCR with LNB and SOFA.

Since the proposed conversion to natural gas-firing at Units 3 and 4 is beyond the five-year window for BART mandated by the CAA and Regional Haze Rule ("RHR"), this control strategy does not directly satisfy the BART option timing requirements for imposing BART. However, because APS and PacifiCorp are making a commitment to cease burning coal in 2025, the cost-effectiveness analysis included the conversion to natural gas option. The BART Reassessment analysis assumed the default 20-year amortization period in the EPA Cost Control Manual, and considered two fuel-use scenarios for comparison purposes:

- Twenty years of operation on coal; and
- Eight years of operation on coal and 12 years of operation on natural gas (Cholla BART Reassessment).

Table 2 summarizes the cost of compliance for the three control options under 20 years of operation on coal. Please refer to Appendix B for detailed cost calculations. As shown in Table 2, the SCR-based control options have an average cost effectiveness of $2,838/ton and $3,083/ton for Unit 3 and Unit 4, respectively. EPA indicates in its Arizona Regional Haze Technical Supporting Document that an average cost-effectiveness of $3,000-4,000/ton falls within an acceptable range to be considered cost-effective. [10] Therefore, assuming 20 years of coal operation at Units 3-4, the SCR-based control options would still be considered cost-effective, which is consistent with the EPA's evaluation of Cholla BART Units 3-4 in the FIP.

Table 3 summarizes the cost of compliance for the three control options under the Cholla BART Reassessment. Please refer to Appendix B for detailed cost calculations. As shown in Table 3, the cost-effectiveness values for both SNCR and SCR control options increase dramatically under the Cholla BART Reassessment when compared to the 20-year operation on coal discussed above. For example, the SCR-based control options have an average cost effectiveness of $6,286/ton and $6,810/ton for Unit 3 and Unit 4, respectively. Correspondingly, the SCR-based control options have an incremental cost-effectiveness of $9,237/ton and $10,539/ton for Unit 3 and Unit 4, respectively. The significant increase of the costs, expressed as dollars per ton of emission reduced under the Cholla BART Reassessment, is due to the following:

- If SCR or SNCR were installed by late 2017, the technology would be fully utilized for less than 8 years with coal-firing until 2025 instead of for 20 years as might otherwise be assumed; and

- Following the conversion of the unit to natural gas in 2025, the operation of either of SCR- or SNCR-based controls would result in low emission reductions. Once converted to natural gas, the use of SNCR-based controls would only reduce NOx emissions by an additional 37 tons/year and 46 tons/year for Unit 3 and Unit 4, respectively. The use of SCR-based controls would only reduce NOx emissions by an additional 92 tons/year and 116 tons/year for Unit 3 and Unit 4, respectively.

Due to the excessive cost of the SCR- and SNCR-based control options, ADEQ has determined that both SNCR and SCR are not cost-effective under the Cholla BART Reassessment.

[10] See EPA Region 9, Arizona Regional Haze Technical Support Document (July 2012), available at http://www.epa.gov/region9/air/actions/pdf/az/arizona-rh-tsd-final.pdf.

Table 2 Average and Incremental Cost Effectiveness for NOx Control Options Assuming 20 years of Operation on Coal

Control Options	Average			Incremental[1]		
	Annual Cost ($/yr)	Emission Reduction Relative To Baseline (ton/yr)	Average Cost Effectiveness ($/ton)	Incremental Annual Cost ($/yr)	Incremental Emission Reduction (ton/yr)	Incremental Cost Effectiveness ($/ton)
Unit 3						
LNB+SOFA	$483,300	1,219	$396	-	-	-
SNCR with LNB+SOFA	$3,070,443	1,911	$1,607	$2,587,143	691	$3,742
SCR with LNB+SOFA	$9,448,912	3,300	$2,838	$8,965,612	2,110	$4,248
Unit 4						
LNB+SOFA	$673,550	1,756	$384	-	-	-
SNCR with LNB+SOFA	$4,086,366	2,643	$1,546	$3,412,816	887	$3,848
SCR with LNB+SOFA	$13,590,853	4,408	$3,083	$12,917,303	2,652	$4,871

[1]*The incremental cost effectiveness results for SNCR and SCR are based on the emission and cost differences between these technologies and the proposed LNB +SOFA option.*

Table 3 Average and Incremental Cost Effectiveness for NOx Control Options Assuming 8 years of Operation on Coal and 12 years of Operation on Natural Gas (Cholla BART Reassessment)

Control Options	Average			Incremental[1]		
	Annual Cost ($/yr)	Emission Reduction Relative To Baseline (ton/yr)	Average Cost Effectiveness ($/ton)	Incremental Annual Cost ($/yr)	Incremental Emission Reduction (ton/yr)	Incremental Cost Effectiveness ($/ton)
Unit 3						
LNB+SOFA	$411,300	488	$843	-	-	-
SNCR with LNB+SOFA	$2,497,743	786	$3,177	$2,086,443	299	$6,989
SCR with LNB+SOFA	$8,716,452	1,387	$6,286	$8,305,152	899	$9,237
Unit 4						
LNB+SOFA	$571,550	702	$814	-	-	-
SNCR with LNB+SOFA	$3,283,930	1,085	$3,027	$2,712,380	383	$7,091
SCR with LNB+SOFA	$12,480,744	1,833	$6,810	$11,909,194	1,130	$10,539

[1]*The incremental cost effectiveness results for SNCR and SCR are based on the emission and cost differences between these technologies and the proposed LNB +SOFA option.*

2.2.2 *BART Factor 2 – Energy and Non-Air Environmental Impacts*

The energy impacts of LNB/SOFA and SNCR are negligible. The energy requirement for SCR is in the range of 0.5 to 1 percent of the power plant output, because SCR incurs an additional parasitic load mainly due to pressure drop across the SCR system.

There are no non-air environmental impacts associated with the LNB/SOFA option. Non-air adverse environmental impacts of SNCR and SCR are primarily attributable to ammonia slip. In addition, transport and handling of anhydrous ammonia presents potential safety hazards.

2.2.3 *BART Factor 3 – Existing Air Pollution Controls*

The Cholla BART Reassessment proposes the continued use of LNB with SOFA as a cost-effective method to control NOx emissions from Units 3 and 4. It further proposes that no additional controls be added in recognition that these units will cease burning coal in mid-2025 through the conversion to pipeline natural gas with a maximum 20 percent annual average capacity factor. The Cholla BART Reassessment also proposes as part of this BART option that Unit 2 would be shut down in April 2016 and that Unit 1 will cease burning coal in 2025.

2.2.4 *BART Factor 4 – Remaining Useful Life*

Unit 2 would be subject to a federally enforceable shutdown date of April 1, 2016. Unit 3 and 4 are not subject to any enforceable shutdown dates. Therefore the default 20-year amortization period in the EPA Cost Control Manual was used to determine the remaining useful life of these facilities in the cost-effectiveness section.

2.2.5 *BART Factor 5 – Degree of Visibility Improvement*

APS and PacifiCorp predicted the degree of visibility improvement that may be reasonably expected from the use of BART emissions controls. The following cases (all with coal-firing assumed) were modeled:

- 2001-2003 baseline with all four units operating;
- BART Option 1: Unit 1 with 2001-2003 baseline controls (pre-LNB), Unit 2 shut down, LNB/SOFA on Units 3 and 4;
- BART Option 2: Unit 1 with 2001-2003 baseline controls (pre-LNB), Unit 2 shut down, LNB/SOFA and SNCR on Units 3 and 4; and
- BART Option 3: Unit 1 with 2001-2003 baseline controls (pre-LNB), Unit 2 shut down, LNB/SOFA and SCR on Units 3 and 4.

Please refer to Appendix C for detailed modeled emissions and stack parameters. APS and PacifiCorp conducted the visibility assessment with the CALPUFF model version 5.8 in the manner approved and used by EPA in its FIP. The CALPUFF modeling incorporated meteorological data for 2001-2003, an assumption of 1.0 part per billion background concentration for ammonia, and "Method 8b" 20 percent best days background conditions for all cases. The CALPUFF modeling predicted impacts to visibility at the thirteen Class I areas within 300 km of Cholla for the baseline, as well as the three control options. Table 4 and Table 5 illustrate the modeled visibility impacts and the corresponding visibility improvements, respectively.

As indicated in Tables 4 and 5, Petrified Forest National Park shows the highest predicted visibility impacts among the thirteen Class I areas. Under Option 1 (retirement of Unit 2 and installation of LNB/SOFA at Units 3 and 4), the visibility impact at Petrified Forest National Park is 4.33 deciview

(dv) which is a 0.98 dv improvement over baseline. Alternatively, Option 3 (retirement of Unit 2 and installation of LNB/SOFA and SCR at Units 3 and 4) results in a visibility impact of 3.55 dv, which is a 1.77 dv improvement over baseline. Therefore, the installation of SCR at Units 3 and 4 results in a 0.79 dv additional visibility improvement over the LNB/SOFA controls until 2025 (the coal-firing time period).

As shown in Table 5, Option 1 results in a cumulative visibility improvement of 13.92 dv and an average visibility improvement of 1.07 dv across the thirteen Class I areas. Comparatively, Option 3 results in a cumulative visibility improvement of 17.89 dv and an average visibility improvement of 1.38 dv across the Class I areas. Therefore, the installation of SCR over the LNB/SOFA controls at Units 3 and 4 results in an additional 3.97 dv cumulative visibility improvement, and an additional 0.31 dv average visibility improvement across the thirteen Class I areas.

The additional visibility improvement provided by installation of SNCR controls (over the LNB/SOFA controls) ranges from 0.01 dv to 0.28 dv across the thirteen Class I areas. The additional visibility improvement due to the installation of SCR controls (over the LNB/SOFA controls) ranges from 0.07 dv to 0.79 dv across the thirteen Class I areas, only two of which reflect a visibility improvement exceeding 0.5 dv.

Table 6 presents the incremental cost per dv for SNCR- and SCR-based controls relative to LNB/SOFA. The incremental cost per dv was calculated based on the cumulative, average, and maximum visibility improvements across the thirteen Class I areas. As shown in Table 6, the incremental cost for SNCR- and SCR-based controls would range from $20 million to $38 million per year in order to achieve an average visibility improvement of 1 dv across the thirteen Class I areas. Following the conversion of the process units to natural gas in 2025, the use of SCR or SNCR over LNB/SOFA controls would result in low NOx emission reductions and, thus, negligible visibility improvements. Therefore, once converted to natural gas, the use of SNCR or SCR controls would result in enormous costs per dv.

Table 4 Predicted Visibility Impacts (22nd highest delta-dV over 3-year period)

Class I Area	Baseline	BART Option 1 (LNB/SOFA)	BART Option 2 (LNB/SOFA/SNCR)	BART Option 3 (LNB/SOFA/SCR)
Petrified Forest NP	5.31	4.33	4.05	3.55
Grand Canyon NP	3.40	1.79	1.62	1.20
Capitol Reef NP	2.19	1.04	0.91	0.62
Mazatzal WA	2.23	0.96	0.87	0.69
Sycamore Canyon	2.27	1.00	0.88	0.67
Mount Baldy WA	2.10	0.97	0.85	0.62
Gila WA	1.53	0.53	0.47	0.39
Sierra Ancha WA	2.28	1.05	0.97	0.81
Mesa Verde NP	2.08	0.88	0.78	0.60
Galiuro WA	0.96	0.34	0.31	0.27
Superstition WA	2.00	1.00	0.93	0.73
Saguaro NP	0.70	0.22	0.22	0.20
Pine Mountain WA	1.64	0.67	0.59	0.48

Table 5 Predicted Visibility Improvement over the Baseline Visibility Impacts (22nd highest delta-dV over 3-year period)

Class I Area	Baseline	BART Option 1 (LNB/SOFA)	BART Option 2 (LNB/SOFA /SNCR)	BART Option 3 (LNB/SOFA /SCR)	Option 2 over Option 1	Option 3 over Option 1
Petrified Forest NP	-	0.98	1.26	1.77	0.28	0.79
Grand Canyon NP	-	1.61	1.78	2.20	0.17	0.59
Capitol Reef NP	-	1.15	1.28	1.57	0.13	0.42
Mazatzal WA	-	1.27	1.36	1.54	0.09	0.27
Sycamore Canyon	-	1.27	1.39	1.60	0.12	0.33
Mount Baldy WA	-	1.14	1.26	1.48	0.12	0.34
Gila WA	-	1.00	1.06	1.14	0.06	0.14
Sierra Ancha WA	-	1.22	1.30	1.47	0.08	0.25
Mesa Verde NP	-	1.21	1.30	1.49	0.09	0.28
Galiuro WA	-	0.62	0.65	0.69	0.03	0.07
Superstition WA	-	1.00	1.07	1.28	0.07	0.28
Saguaro NP	-	0.48	0.49	0.50	0.01	0.02
Pine Mountain WA	-	0.97	1.04	1.16	0.07	0.19
Cumulative		13.92	15.24	17.89	1.32	3.97
Average		1.07	1.17	1.38	0.10	0.31

Table 6 Incremental Cost per dv for SNCR- and SCR-Based Controls (Relative to LNB+SOFA)[1]

		Unit 3		Unit 4	
		SNCR with LNB+SOFA	SCR with LNB+SOFA	SNCR with LNB+SOFA	SCR with LNB+SOFA
Incremental Annual Cost ($/yr)		$2,086,443	$8,305,152	$2,712,380	$11,909,194
Visibility Improvement (dV)	Maximum	0.28	0.79	0.28	0.79
	Cumulative	1.32	3.97	1.32	3.97
	Average	0.10	0.31	0.10	0.31
Incremental Cost per dv (million $/dV)	Maximum	7.45	10.51	9.69	15.07
	Cumulative	1.58	2.09	2.05	3.00
	Average	20.86	26.79	27.12	38.42

[1] *The incremental cost per dv analysis is applicable to coal operation only. Once converted to natural gas in the year 2025, use of SNCR or SCR controls would result in negligible visibility improvements and, thus enormous costs per dv.*

2.3 ADEQ's Determination on Cholla BART Reassessment

SNCR with LNB+SOFA

The SNCR-based control options (over the LNB/SOFA controls) have an incremental cost effectiveness of $6,989/ton and $7,091/ton for Unit 3 and Unit 4, respectively. The SNCR-based control options also result in an incremental visibility improvement ranging from 0.01 dv to 0.28 dv across the thirteen Class I areas. Considering the excessive cost and insignificant additional visibility improvements resulting from the SNCR-based control options, ADEQ has eliminated SNCR control as BART for Units 3 and 4.

SCR with LNB+SOFA

The SCR-based control options (over the LNB/SOFA controls) have an incremental cost effectiveness of $9,237/ton and $10,539/ton for Unit 3 and Unit 4, respectively. The SCR-based control options result in an incremental visibility improvement ranging from 0.07 dv to 0.79 dv across the thirteen Class I areas, only two of which reflect a visibility improvement exceeding 0.5 dv. The installation of SCR over the LNB/SOFA controls result in a 3.97 dv cumulative incremental visibility improvement and a 0.31 dv average incremental visibility improvement across the Class I areas. These additional visibility improvements from SCR-based controls only last less than 8 years with coal-firing (late 2017-2025). Once the units are converted to natural gas in 2025, SCR-based controls would have negligible visibility improvements relative to LNB/SOFA controls. Overall, additional visibility improvements from SCR-based controls are not substantial. Considering the excessive cost and moderate additional visibility improvements resulting from the SCR-based control options, ADEQ has eliminated SCR controls as BART for Units 3 and 4.

LNB+SOFA

The LNB/SOFA controls have a reasonable average cost effectiveness of $843/ton and $814/ton for Unit 3 and Unit 4, respectively. The LNB/SOFA control options, along with the shutdown of Unit 2, results in a visibility improvement ranging from 0.48 dv to 1.61 dv over baseline across the thirteen Class I areas. There are no adverse energy or non-air environmental impacts associated with the LNB/SOFA option.

Based on the above analysis, ADEQ has determined that LNB with SOFA is BART for NOx at Units 3 and 4 under the Cholla BART Reassessment.

3.0 DEMONSTRATING NONINTERFERENCE UNDER CLEAN AIR ACT SECTION 110(l)

As described in the preceding sections, this revision to Arizona's Regional Haze program incorporates changes to the BART determination and control strategies for Cholla. The revised control strategies are intended to replace those contained in Arizona's February 28, 2011Arizona RH SIP. Revisions to a submitted Arizona RH SIP must not interfere with the requirements of the CAA, as described in CAA Section 110(l):

> (l) PLAN REVISIONS - Each revision to an implementation plan submitted by a State under this Act shall be adopted by such State after reasonable notice and public hearing. The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act.[11]

The evaluation in following Sections 3.1 and 3.2 demonstrate that the current SIP revision will not interfere with the ability of the program area to attain and maintain the NAAQS or any other requirement of the CAA.

3.1 Demonstrating Noninterference with Attainment of the National Ambient Air Quality Standards under Clean Air Act Section 110(l)

As indicated above, a state must accompany each revision to an air quality SIP with a demonstration that those changes will not interfere with attainment or maintenance of the NAAQS. An evaluation on the impact of the proposed control strategies within this Cholla Reassessment SIP revision indicates the changes would not impact the NAAQS. In determining noninterference, ADEQ conducted an analysis comparing the long-term emissions expectations during 2016-2046 for the relevant pollutants (PM_{10}, SO_2, and NOx) under the control strategies listed in this Cholla BART Reassessment and the prescribed control measures in the applicable SIP or FIP. ADEQ selected Year 2016 as the starting year for comparison purposes because, prior to 2016, there is no difference in PM_{10}, SO_2, and NOx emissions between the Cholla BART Reassessment and the applicable SIP or FIP[12].

The following comparisons were made: 1) NOx annual emission analysis for the EPA FIP and the Cholla BART Reassessment, 2) PM_{10} annual emission analysis for the 2011 State of Arizona's SIP ("2011 AZ SIP") and the Cholla BART Reassessment, and 3) SO_2 annual emission analysis for the 2011 AZ SIP and the Cholla BART Reassessment. ADEQ also went one step further to examine potential impacts the revised control measures may have on the attainment and maintenance of the Ozone NAAQS.

ADEQ's analysis and findings are described below, starting with the relevant regulatory background in Section 3.1.1. Section 3.1.2 follows with a discussion comparing changes to annual PM_{10} emissions that would result under the currently effective 2011 AZ SIP vs. the Cholla BART Reassessment. Next, Section 3.1.3 compares and discusses SO_2 annual emission changes that would result under the 2011 AZ SIP vs. the Cholla BART Reassessment. Then, Section 3.1.4 discusses the comparison of NOx annual emission changes that result from EPA FIP vs. the Cholla BART Reassessment. Finally, Section 3.1.5 discusses the impact and long-term benefits the Cholla BART Reassessment would have to attainment

[11] 42 U.S.C. § 7410(l), 2012; CAA § 110.

[12] There is no difference in $PM_{10}/SO_2/NOx$ emissions because the installation of baghouses, flue-gas desulfurization (FGD), and LNB on Units 3 and 4 occurred prior to the 2011 Arizona SIP.

and maintenance of Ozone NAAQS.

3.1.1 Regulatory Background

Title I of the CAA requires EPA to set NAAQS for pollutants that are designated harmful to public health or the environment. It must set both primary and secondary standards for each regulated pollutant that is designated by Agency. Primary standards must specify threshold levels that ensure the protection of public health, whereas secondary standards are designed to protect public welfare (i.e., decreased visibility, damage to animals, crops, vegetation, and buildings). To date, EPA has established primary and secondary NAAQS for six air pollutants, commonly referred to as criteria pollutants, which are: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ground-level ozone (O_3), particulate matter (PM), and sulfur dioxide (SO_2). EPA is required by the CAA to periodically evaluate and revise the air quality standards, when necessary, to ensure the protection of the public's health and welfare.

CAA Section 107(d) directs the states to make recommendations, and the EPA to designate as it sees fit, areas within its jurisdiction as either: 1) meeting the NAAQS ("attainment"), 2) not meeting the NAAQS ("nonattainment"), or 3) cannot be classified ("unclassifiable"). EPA will designate an area "nonattainment" when the air quality data shows that those locations are violating or contribute to violations of a NAAQS for a criteria pollutant. A state is required to create a nonattainment SIP describing its plan for achieving reasonable further progress towards attainment of the NAAQS. As those areas move towards establishing attainment status, they are then required to develop and submit a maintenance SIP for approval prior to re-designation.

EPA will designate an area as "attainment" or "unclassified" when the air quality data shows that those areas are not violating the NAAQS or there is not enough data to determine violations exist. Areas designated as attainment and unclassified are not required to create extensive nonattainment plans since those areas do not violate the relevant NAAQS. Instead, attainment areas must show noninterference with the continued attainment and maintenance of the NAAQS following the initial infrastructure SIP, which is submitted shortly after area designations are made. If air quality monitoring data later shows that an attainment area is in violation of the NAAQS following a prior designation, it will be reclassified as nonattainment and then required to develop an attainment plan.

The APS Cholla Generating Station is located in Navajo County. The area is currently designated as attainment or unclassifiable for CO, Pb, NO_2, O_3, $PM_{2.5}$ (1997 and 2006 NAAQS), PM_{10}, and SO_2 (1971 NAAQS).[13] Although designations have not yet been made for the 2012 $PM_{2.5}$ and 2010 SO_2 NAAQS, the area was recommended as attainment or unclassifiable for both pollutants under CAA Section 107(d)(1)(A).[14] Table 7 shows the current designation status of the area for each criteria pollutant listed in 40 CFR § 81.303.[15]

[13] *See* EPA, *The Green Book Nonattainment Areas for Criteria Pollutants*, at http://www.epa.gov/airquality/greenbook/ (last visited Mar. 24, 2015).
[14] *See generally* ADEQ, *Air Quality Division: Plans*, at http://www.azdeq.gov/environ/air/plan/pm2.5.html and http://www.azdeq.gov/environ/air/plan/so2.html..
[15] 40 CFR § 81.303, 2013.

Table 7 Attainment Status for Navajo County

Pollutant	Primary/Secondary	Averaging Time	Designation
Carbon Monoxide	Primary (1971)	8-hour	Nonclassifiable/Attainment
		1-hour	Nonclassifiable/Attainment
Lead	Primary and Secondary (2008)	Rolling 3 Month Average	Unclassifiable/Attainment
Nitrogen Dioxide	Primary (2010)	1-hour	Unclassifiable/Attainment
	Primary and Secondary (1971)	Annual	Cannot be classified or better than national standards
Ozone	Primary and Secondary (2008)	8-hour	Unclassifiable/Attainment
$PM_{2.5}$	Primary (2012)	Annual	Not yet designated
	Secondary (1997)	Annual	Unclassifiable/Attainment
	Primary and Secondary (2006)	24-hour	Unclassifiable/Attainment
PM_{10}	Primary and Secondary (1987)	24-hour	Unclassifiable
Sulfur Dioxide	Primary (2010)	1-hour	Not yet designated
	Primary (1971)	24-hour	Better than national standards
	Primary (1971)	Annual	Better than national standards
	Secondary (1971)	3-hour	Better than national standards

3.1.2 Noninterference with Attainment of NAAQS for PM_{10}

A comparison of PM_{10} emission control strategies for the 2011 AZ SIP vs. Cholla BART Reassessment is provided below in Table 8. Table 9 summarizes the annual PM_{10} emissions of each relevant time period for the 2011 AZ SIP vs. Cholla BART Reassessment. Figure 1 shows the cumulative PM_{10} emissions for the 2011 AZ SIP vs. Cholla BART Reassessment over 2016-2046. Please refer to Appendix D for detailed PM_{10} annual emission estimations.

In general, the PM_{10} emissions control strategies proposed in the Cholla BART Reassessment are consistent with those of the 2011 AZ SIP except: 1) instead of installing a new baghouse at Unit 2, APS will cease operation of Unit 2 under the Reassessment, and 2) by 2025 Units 3 and 4 would be converted to natural gas-firing operation with a 20 percent annual average capacity factor. The drastic switch from a coal-firing operation to natural gas will have a prolonged impact on PM_{10} emissions for the remaining life of the facility.

Table 8 Comparison of PM_{10} Emission Control Strategies for 2011 AZ SIP vs. Cholla BART Reassessment

	Time Period	Controls Measures
2011 AZ SIP	2016-2046	Baghouses for Units 2, 3, and 4
Cholla BART Reassessment	2016-2025	Baghouses for Units 3 and 4; Unit 2 is shut down by April 1, 2016
	2026-2046	Units 1, 3, and 4 are operated on natural gas with a 20 percent annual average capacity factor; Unit 2 is shut down

As shown in Table 9, the control strategies of the Cholla BART Reassessment will result in greater reductions in PM_{10} emissions than the 2011 AZ SIP. The PM_{10} emissions levels are impacted initially by the shutdown of Unit 2 in 2016, and then the conversion to natural gas-firing at Units 3 and 4 in 2025. Overall, by 2046, the Cholla BART Reassessment will result in lower PM_{10} emissions relative to the 2011 AZ SIP by about 15,000 tons (See Figure 1).

Table 9 Comparison of PM_{10} Emissions for 2011 AZ SIP vs. Cholla BART Reassessment

Time Period	Unit Number	Annual PM_{10} (tpy)	
		2011 AZ SIP	Cholla BART Reassessment
2016	Unit 1	84	84
	Unit 2	214[1]	78[2]
	Unit 3	197	197
	Unit 4	269	269
	Total	764	628
2017-2025	Unit 1	84	84
	Unit 2	181	0
	Unit 3	197	197
	Unit 4	269	269
	Total	731	550
2026-2046	Unit 1	84	13
	Unit 2	181	0
	Unit 3	197	30
	Unit 4	269	39
	Total	731	82

[1] *The compliance date for the AZ SIP emission limit of 0.015 lb/MMBtu is April 1, 2016.*
[2] *Unit 2 will be permanently shut down by April 1, 2016. PM_{10} emission number for Unit 2 is based on operation of this unit until April 1, 2016.*

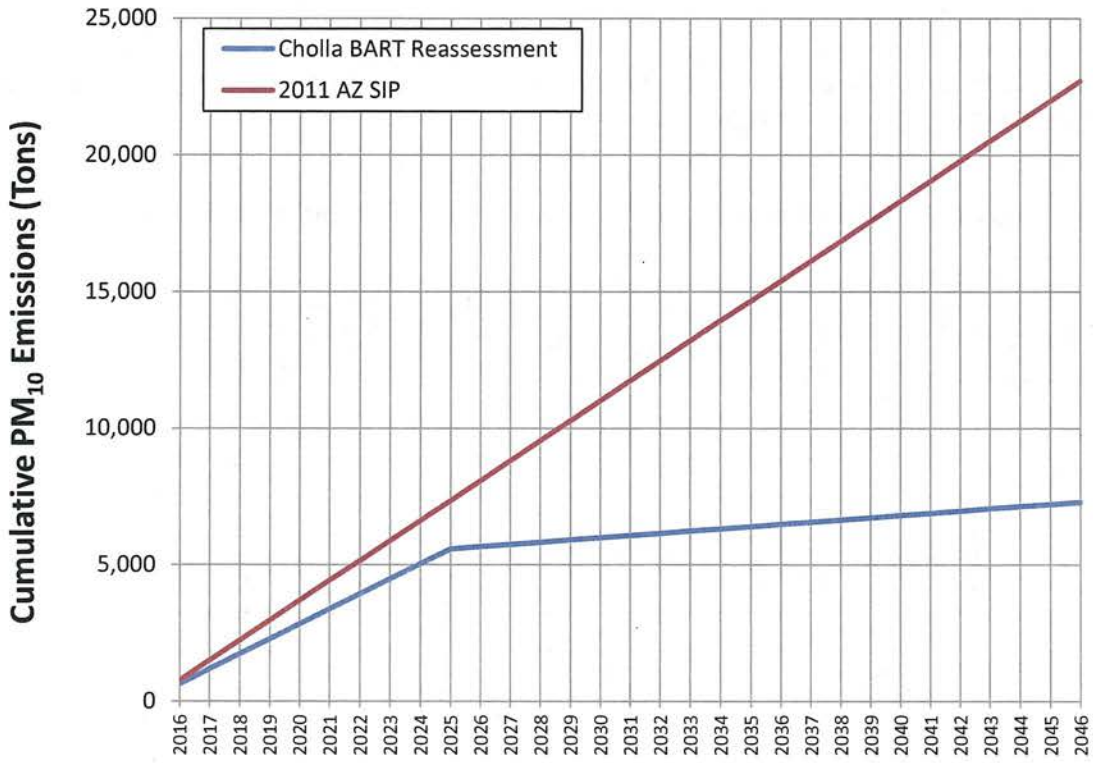

Figure 1 Cumulative PM_{10} Emissions Associated with 2011 AZ SIP vs. Cholla BART Reassessment over 2016-2046

Navajo County is designated attainment or unclassifiable for PM_{10}. As such, there are no nonattainment or maintenance SIPs that would rely on emission reductions at Cholla to ensure continued attainment of the NAAQS. The significant PM_{10} emission reductions achieved by the control strategy in the Cholla BART Reassessment will not result in any interfere with attainment or maintenance of the PM_{10} NAAQS because the emissions will be further reduced. In addition, these revised control measures implement a strategic long-term plan to significantly lower emissions, which is likely to ensure attainment of lower standards that may be promulgated in the future.

3.1.3 Noninterference with Attainment of NAAQS for SO_2

A comparison of SO_2 emission control strategies for the 2011 AZ SIP vs. Cholla BART Reassessment is provided below in Table 10. Table 11 summarizes the annual SO_2 emissions of each relevant time period for the 2011 AZ SIP vs. Cholla BART Reassessment. Figure 2 shows the cumulative SO_2 emissions for the 2011 AZ SIP vs. Cholla BART Reassessment over 2016-2046. Please refer to Appendix D for detailed SO_2 annual emission estimations.

In general, the SO_2 emissions control strategies proposed in the Cholla BART Reassessment are consistent with those of the 2011 AZ SIP except: (1) instead of installing a FGD at Unit 2, APS will cease operation of Unit 2 under the Reassessment, and (2) by 2025 Units 3 and 4 would be converted to

natural gas-firing operation with a 20 percent annual average capacity factor. The drastic switch from a coal-firing operation to natural gas will have a prolonged impact on SO_2 emissions for the remaining life of the facility.

Table 10 Comparison of SO_2 Emission Control Strategies for 2011 AZ SIP vs. Cholla BART Reassessment

	Time Period	Controls
2011 AZ SIP	2016-2040	FGD systems for Units 2, 3, and 4
Cholla BART Reassessment	2016-2025	FGD systems for Units 3 and 4; Unit 2 is shut down by April 1, 2016
	2026-2040	Units 1, 3, and 4 are operated on natural gas with a 20 percent annual average capacity factor; Unit 2 is shutdown

As shown in Table 11, the control strategies of the Cholla BART Reassessment will result in greater reductions to SO_2 emissions than the 2011 AZ SIP. The greater emission reductions are initially achieved by the shutdown of Unit 2 in 2016. In 2025, the conversion to natural gas-firing will result in significant reductions of SO_2 emissions at Unit 3 and 4. Overall, by 2046, the Cholla BART Reassessment will result lower SO_2 emissions relative to the 2011 AZ SIP by about 170,000 tons (See Figure 2).

Table 11 Comparison of SO_2 Emissions for 2011 AZ SIP vs. Cholla BART Reassessment

Time Period	Unit Number	Annual SO_2 (tpy)	
		2011 AZ SIP	Cholla BART Reassessment
2016	Unit 1	844	844
	Unit 2	1,614	452 [1]
	Unit 3	1,966	1,966
	Unit 4	2,688	2,688
	Total	7,112	5,950
2017-2025	Unit 1	844	844
	Unit 2	1,614	0
	Unit 3	1,966	1,966
	Unit 4	2,688	2,688
	Total	7,112	5,498
2026-2046	Unit 1	844	1
	Unit 2	1,614	0
	Unit 3	1,966	2
	Unit 4	2,688	2
	Total	7,112	5

[1] *Unit 2 will be permanently shut down by April 1, 2016. SO_2 emission number for Unit 2 is based on operation of the unit until April 1, 2016.*

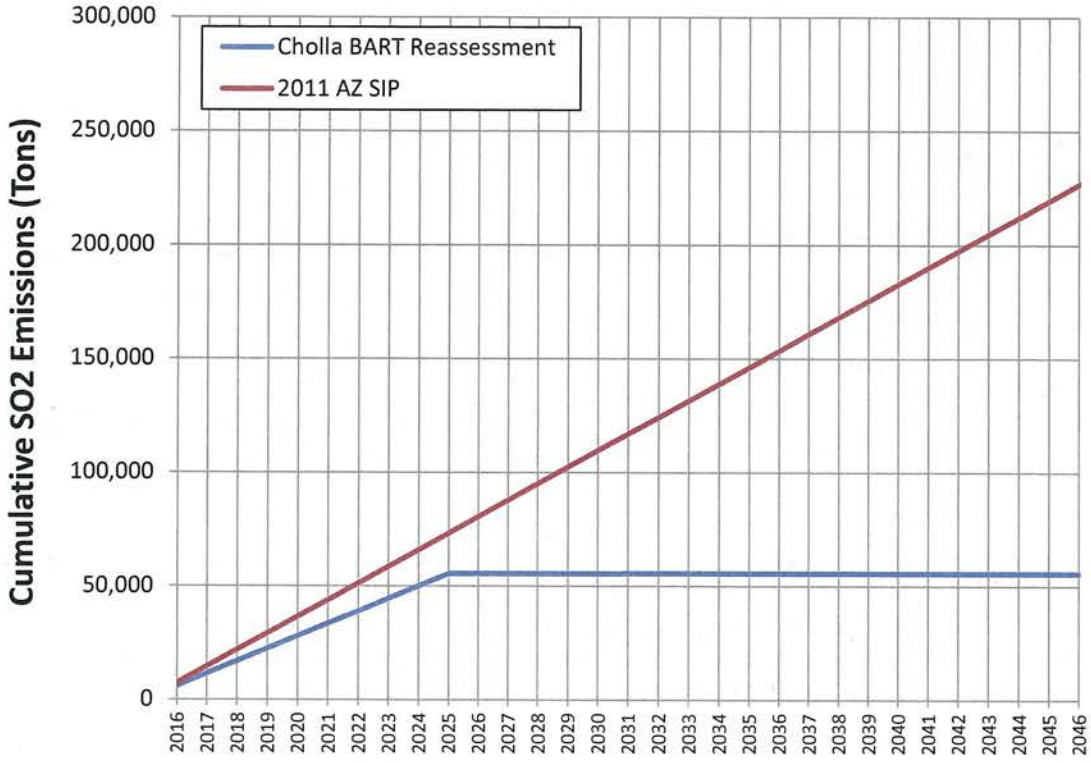

Figure 2 Cumulative SO_2 Emissions Associated with 2011 AZ SIP vs. Cholla BART Reassessment over 2016-2046

Navajo County is designated attainment or unclassifiable for SO_2. As such, there are no nonattainment or maintenance SIPs that might rely on emission reductions at Cholla to ensure continued attainment of the NAAQS. The significant SO_2 emission reductions achieved by the control strategy in the Cholla BART Reassessment will not interfere with attainment or maintenance of the SO_2 NAAQS. Further, these revised control measures implement a strategic long-term plan for significantly lower emissions, which is likely to ensure attainment of more stringent standards that may be promulgated in the future.

3.1.4 Noninterference with Attainment of NAAQS for NO_2

As previously discussed in Section 2.1, the EPA FIP requires the installation and operation of SCR controls with LNB/SOFA emission controls on Units 2, 3, and 4 by December 5, 2017. The Cholla BART Reassessment proposes to instead permanently shut down Unit 2 by April 1, 2016, to operate Units 3 and 4 with the currently installed LNB/SOFA, and to switch to natural gas-firing for Units 3 and 4 with a $\leq$ 20 percent annual average capacity factor. Table 12 provides a comparison of NOx emission control strategies for the EPA FIP vs. Cholla BART Reassessment.

Table 12 Comparison of NOx Emission Control Strategies for EPA FIP vs. Cholla BART Reassessment

	Time Period	Controls
EPA FIP	2016-2017	LNB/SOFA for Units 2, 3, and 4[1]
	2018-2046	SCR with LNB/SOFA for Units 2, 3, and 4
Cholla BART Reassessment	2016-2025	LNB/SOFA for Units 3 and 4; Unit 2 is shut down by April 1, 2016
	2026-2046	Units 1, 3, and 4 are operated on natural gas with a 20 percent annual average capacity factor; Unit 2 is shutdown

[1]*EPA FIP does not require the installation of LNB/SOFA on Unit 2, 3, and 4 until December 5, 2017. However, the LNB/SOFA controls were already installed on Unit 1, 2, 3, and 4 before the 2011 AZ SIP. Therefore, it is assumed that theses controls have been in place during 2016-2017 under EPA FIP.*

Table 13 summarizes a comparison of the annual NOx emissions for the Cholla BART Reassessment vs. EPA FIP during various time periods. Please refer to Appendix D for NO_X annual emission estimations.

Table 13 Comparison of NOx Annual Emissions for EPA FIP vs. Cholla BART Reassessment

Time Period	Unit Number	Annual NOx (tpy)		
		EPA FIP	Cholla BART Reassessment	Annual Emission Change (Cholla BART Reassessment to EPA FIP)
2016	Unit 1	1,131	1,131	0
	Unit 2	3,601	900[1]	-2,701
	Unit 3	2,766	2,766	0
	Unit 4	3,548	3,548	0
	Total	11,046	8,345	-2,701
2017	Unit 1	1,131	1,131	0
	Unit 2	3,601	0	-3,601
	Unit 3	2,766	2,766	0
	Unit 4	3,548	3,548	0
	Total	11,046	7,445	-3,601
2018-2025	Unit 1	1,131	1,131	0
	Unit 2	602	0	-602
	Unit 3	655	2,766	2,111
	Unit 4	896	3,548	2,652
	Total	3,284	7,445	4,161
2026-2046	Unit 1	1,131	105	-1,026
	Unit 2	602	0	-602
	Unit 3	655	244	-411
	Unit 4	896	308	-588
	Total	3,284	657	-2,627

[1]*Unit 2 will be permanently shut down by April 1, 2016. NOx emission number for Unit 2 is based on operation of the unit until April 1, 2016.*

As indicated in Table 13, due to the shutdown of Unit 2 the Cholla BART Reassessment will result in lower NOx emissions in 2016 and 2017 when compared with the EPA FIP. However, the Cholla BART Reassessment will result in 4,161 tpy more NOx emissions than the EPA FIP during 2018-2025. After 2025, due to the conversion to natural gas the Cholla BART Reassessment will result in greater and more continuous NOx emission reductions than the EPA FIP.

Based on Table 13, ADEQ further performed a cumulative NOx emission analysis for the Cholla BART Reassessment vs. EPA FIP during 2016-2046. The results are shown below in Figure 3.

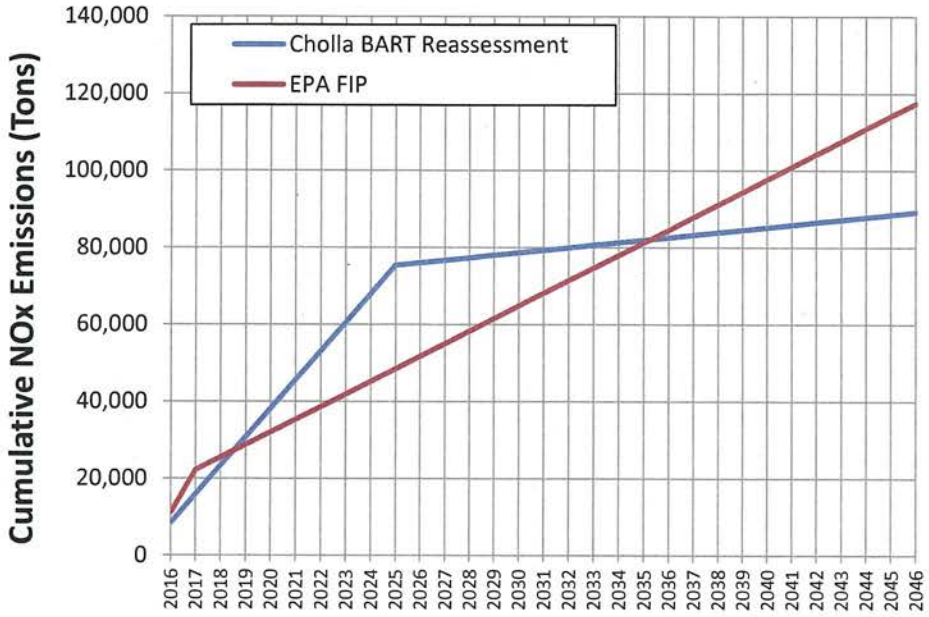

Figure 3 Cumulative NOx Emissions Associated with EPA's FIP vs. Cholla BART Reassessment over 2016-2046

As indicated in Figure 3, at the initial stage (2016-2017), the Cholla BART Reassessment will achieve greater NOx emission reductions than the EPA FIP due to the complete shutdown of Unit 2. After that, the EPA FIP will achieve greater NOx emission reductions than the Cholla BART Reassessment for a limited period of time (2018-2025) due to the installation of SCR controls on Units 2, 3, and 4. However, under the Cholla BART Reassessment, the BART units (Units 3 and 4) along with the non-BART unit (Unit 1) will be converted to natural gas-firing operation in 2025, resulting in significant NOx emission reductions. Comparatively, the EPA FIP envisions that the Cholla BART units will use coal as fuel for the entirety of the remaining life of the facility. Overall, the Cholla BART Reassessment will result in greater NOx emission reductions than the EPA FIP when considering the overall, long-term environmental impacts. As is illustrated in Figure 3, the long-term benefits of natural gas conversion far outweigh those of SCR controls. The Cholla BART Reassessment will result in 28,000 fewer tons of NOx emissions relative to the EPA FIP by 2046.

Navajo County is designated attainment or unclassifiable for NOx. As such, there are no nonattainment or maintenance SIPs that might rely on emission reductions at Cholla to ensure continued attainment of the NAAQS. Figure 4 shows the changes of the facility-wide NOx emissions from Cholla during 2010-2046 under the Cholla BART Reassessment. It is clear from Figure 4 that the NOx emissions from Cholla drop with time. Since the Cholla BART Reassessment will result in NOx emission reductions

relative to the existing operating conditions of the facility, it will not interfere with attainment or maintenance of the current NO_2 NAAQS. Further, the Cholla BART Reassessment implements a strategic long-term plan that will significantly lower emissions, which is likely to ensure continued attainment of more stringent standards that may be promulgated in the future.

Figure 4 Annual Facility-wide NOx Emissions under Cholla BART Reassessment

3.1.5. Noninterference with the Attainment of NAAQS for Ozone

Ozone is formed when volatile organic compounds, NO_x, and oxygen combine in the atmosphere in the presence of sunlight. Navajo County is designated attainment or unclassifiable for ozone. As such, there are no nonattainment or maintenance SIPs that might rely on emission reductions at Cholla to ensure continued attainment of the NAAQS. As shown in Figure 4, the Cholla BART Reassessment will result in greater long-term NO_x (a precursor for ozone) emission reductions, thereby resulting in greater long-term ozone reductions. Therefore, the Cholla BART Reassessment will not interfere with attainment or maintenance of the current NAAQS for ozone. Further, the anticipated long-term reduction expected for NO_x will be advantageous in working toward achieving the anticipated lower ozone NAAQS.

3.2 Demonstrating Noninterference with Other Applicable Requirements under Clean Air Act Section 110(l)

Cholla is also subject to visibility protection requirements for Federal Class I areas under CAA Section 169A, as well as air toxics under Section 112.

3.2.1 Regional Haze Program

To address the problem of regional haze, EPA adopted the Regional Haze Rule in 1999. This rule requires states to adopt regional haze plans to incrementally improve visibility in all Class 1 areas over the next 60 years. The first regional haze plan must include Reasonable Progress Goals ("RPG") for each Class I area, for the year 2018, also known as the "2018 milestone year."

The CAA requires the installation and operation of BART as expeditiously as practicable, but in no event later than five years after the date of approval of a SIP or promulgation of a FIP.[16] Therefore, the EPA FIP for Cholla will take effect in late 2017. Arizona's RH SIP also included a long-term strategy for making reasonable progress toward restoring visibility at Class I areas to natural conditions by 2064. The CAA defines long-term as ten to fifteen years and Arizona's long-term strategy, submitted to EPA in 2011, includes emission reductions and visibility improvements that are expected by 2018.

The visibility impact analysis presented in the Cholla BART Reassessment Section 2.2.5 focuses on the "2018 milestone year." However, to support the CAA Section 110(l) analysis, APS and PacifiCorp have conducted additional modeling to compare long-term visibility impact benefits of the Cholla BART Reassessment with those of the EPA FIP for the period of 2016 to 2046, which is consistent with long-term emissions analysis as presented in Section 3.1. Further, to simplify the visibility analysis, the modeling neglected the difference between the EPA FIP and the Cholla BART Reassessment during 2016-2017 and focused the comparison for the period of 2018 to 2046. In fact, the Cholla BART Reassessment will achieve greater visibility improvement than the EPA FIP during 2016-2017, since the EPA FIP imposes additional controls at Unit 2 while the Cholla BART Reassessment proposes to permanently shut down Unit 2. Detailed modeling scenarios for the long-term visibility improvement from the Cholla BART Reassessment vs. EPA FIP are shown in Table 14.

APS and PacifiCorp conducted the visibility assessment with the CALPUFF model version 5.8 in the manner approved and used by EPA in its FIP. The CALPUFF modeling involved meteorological data for 2001-2003, an assumption of 1.0 part per billion background concentration for ammonia, and "Method 8b" 20 percent best days background conditions for all cases. Based on various modeling scenarios, as shown in Table 14, APS and PacifiCorp predicted the visibility impacts at the thirteen Class I areas within 300 km of Cholla. Table 15 summaries the modeled results. Figure 5 provides a comparison of the total visibility impacts over the thirteen Class I areas from the Cholla BART Reassessment vs. the EPA FIP for various time periods.

[16] 42 U.S.C. § 7491, 2012; CAA § 169A.

Table 14 Modeling Scenarios for Long-term Visibility Improvement from EPA FIP vs. Cholla BART Reassessment

	Time Period	Modeling Scenarios
EPA FIP	2018-2046	SCR with LNB/SOFA controls for Units 2, 3, and 4 and LNB/SOFA controls for Unit 1; FGD systems for Units 2, 3, and 4; new baghouses for Units 2, 3, and 4.
Cholla BART Reassessment	2018-2025	LNB/SOFA controls for Units 1, 3, and 4; FGD systems for Units 3 and 4; new baghouses for Units 3 and 4; Unit 2 is shutdown.
	2026-2046	Units 1, 3, and 4 are operated on natural gas with a 20 percent annual average capacity factor; Unit 2 is shutdown.

Table 15 Predicted Visibility Impacts at Class I Areas Associated with EPA FIP vs. Cholla BART Reassessment

Class I Areas	EPA FIP	Cholla BART Reassessment	
	2018-2046	2018-2025	2026-2046
Petrified Forest NP	2.64	3.75	1.45
Grand Canyon NP	1.11	1.48	0.45
Capitol Reef NP	0.62	0.92	0.29
Mazatzal W A	0.75	0.83	0.30
Sycamore Canyon WA	0.73	0.94	0.29
Mount Baldy WA	0.69	0.87	0.28
Gila WA	0.46	0.47	0.17
Sierra Ancha WA	0.82	0.94	0.36
Mesa Verde NP	0.63	0.84	0.30
Galiuro WA	0.29	0.30	0.09
Superstition WA	0.73	0.88	0.30
Saguaro NP	0.20	0.19	0.05
Pine Mountain WA	0.51	0.58	0.17
Cumulative impacts over thirteen Class I Areas	10.18	12.99	4.50

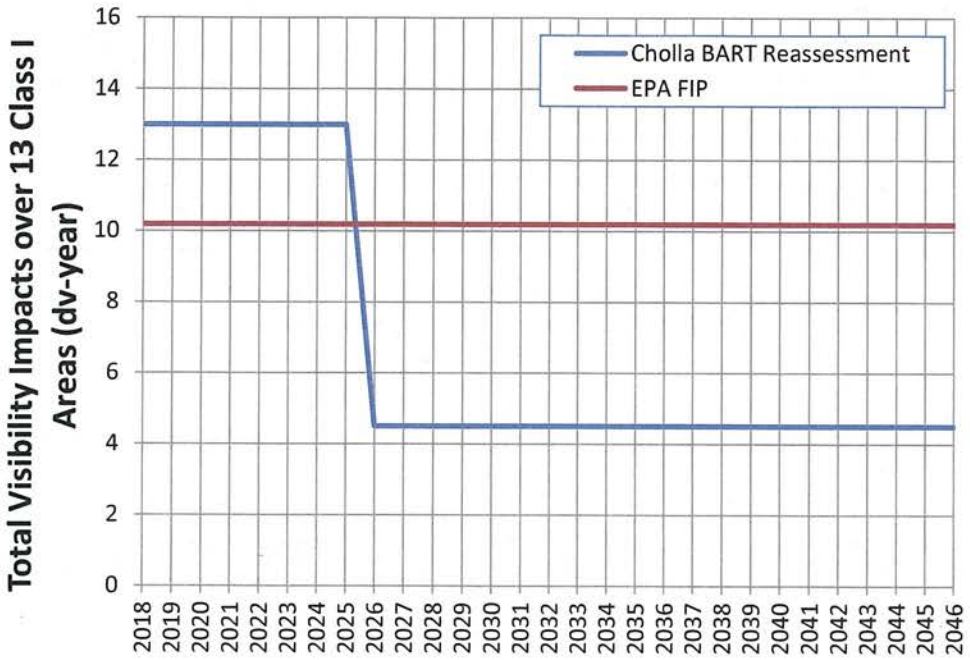

Figure 5 Comparison of Total Visibility Impacts over Thirteen Class I Areas Associated with EPA FIP vs. Cholla BART Reassessment

As indicated in Table 15 and Figure 5, the EPA FIP will achieve greater visibility improvements than the Cholla BART Reassessment after 2017 and until 2025, due primarily to the installation of SCR controls. After the natural gas conversion in 2025, the Cholla BART Reassessment will result in greater visibility improvements compared with the EPA FIP.

APS and PacifiCorp further performed a comparison of integrated visibility impact benefits between the Cholla BART Reassessment and the EPA FIP for each Class I area during the 2018-2046 period. Figure 6 presents the integrated visibility impacts at Petrified Forest National Park (the closest Class I area) for the Cholla BART Reassessment as well as the EPA FIP. As shown in Figure 6, the EPA FIP (the red curve) has lower integrated visibility impacts than the Cholla BART Reassessment (the blue curve) at the initial time period. The two curves then intersect at a certain point after the natural gas conversion in 2025. After that, the Cholla BART Reassessment shows greater integrated visibility improvements through 2046. Overall, the long-term visibility benefits are greater with the Cholla BART Reassessment than the EPA FIP. The general pattern of the integrated visibility results for the other twelve Class I areas is similar to that for Petrified Forest National Park. A more detailed description of visibility impacts due to the proposed BART Reassessment is provided in Appendix E.

The RHR sets a goal of achieving natural visibility conditions at every Class I area by 2064, and the EPA has directed States to make incremental, reasonable progress toward that goal. Although the proposed natural gas conversion under the Cholla BART Reassessment falls beyond the five-year window for BART, as is mandated by the CAA and RHR, it would result in significant long-term visibility improvements, which are consistent with the long-term goals and plans of the RHR. Therefore, ADEQ concludes that the Cholla BART Reassessment will not interfere with the regional haze program.

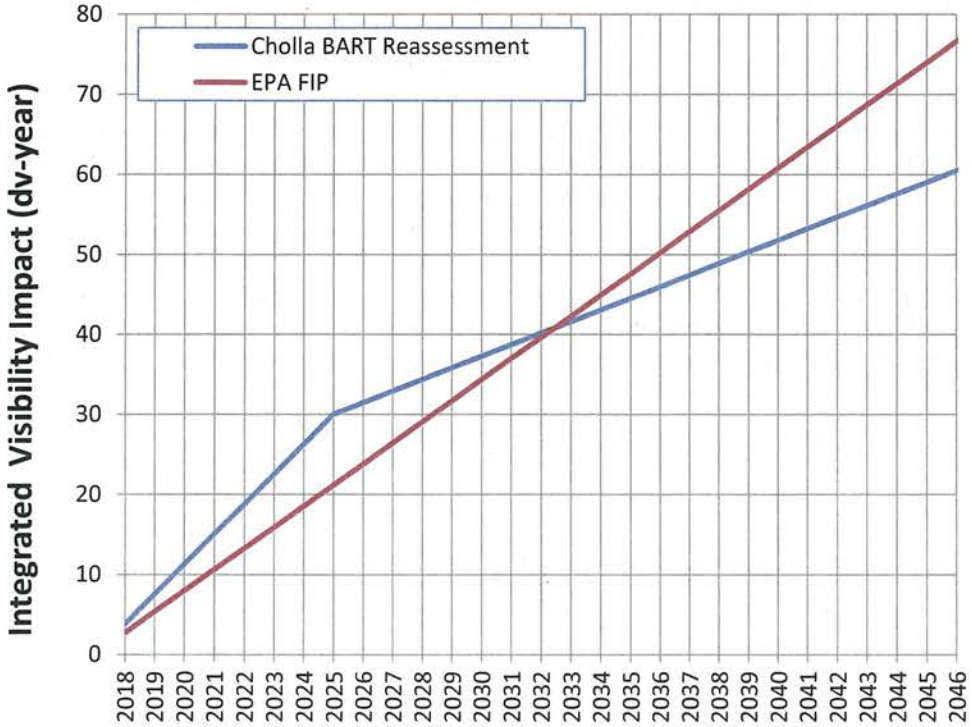

Figure 6 Comparison of Integrated Visibility Impacts at Petrified Forest National Park Associated with EPA FIP vs. Cholla BART Reassessment

3.2.2 Air Toxics

EPA developed standards for mercury and other air toxics for coal- and oil-fired electric generating units, effective April 2015. ADEQ approved APS's request for a one-year extension for implementation of the MATS rule to April 2016.

Cholla proposes to implement sorbent injection at Units 1, 3, and 4 by March 2016, and proposes to permanently cease operation of Unit 2 by April 2016. These actions are designed to reduce air toxics from the facility and achieve compliance with MATS rule emission limits.

Arizona thus concludes that this SIP revision will not interfere with any applicable air toxics requirements of the CAA.

3.3 Conclusions of Clean Air Act Section 110(l) Analysis

The RHR sets a goal of achieving natural visibility conditions at every Class I area by 2064, and the EPA has directed states to make incremental, reasonable progress toward that goal. In this technical analysis, ADEQ evaluated emission reductions and visibility improvements of the Cholla BART Reassessment against the EPA FIP, not only based on the 2018 time frame, but also from a more long-term perspective. ADEQ found that the proposed Cholla BART Reassessment would result in greater reductions in long-term emission, as well as greater visibility benefits than the EPA FIP. Although the proposed natural gas conversion falls beyond the five-year window for BART, as is mandated by the CAA and RHR, it would result in significant long-term emission reductions and visibility improvements, which are consistent with the long-term goals and plans of the RHR. Moreover, the proposed shutdown of Unit 2 in 2016 will further reduce pollutant emissions, and the resulting environmental benefits will occur two years earlier than the 2018 deadline. The foregoing demonstrates that the proposal under the Cholla BART Reassessment will not interfere with the attainment of the NAAQS or any other requirement under CAA 110(l).

APPENDIX A

Arizona Public Service Company (APS) Cholla Generating Station

Permit Revision

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Air Quality Division

1110 W. Washington Street Phoenix, AZ 85007 Phone: (602) 771-2338

AIR QUALITY CONTROL PERMIT

(As required by Title 49, Chapter 3, Article 2, Section 49-426, Arizona Revised Statutes)

This air quality control permit does not relieve applicant of responsibility for meeting all air pollution regulations

1. PERMIT TO BE ISSUED TO (Business license name of organization that is to receive permit)

   Arizona Public Service Company

2. NAME (OR NAMES) OF OWNER OR PRINCIPALS DOING BUSINESS AS THE ABOVE ORGANIZATION

   Arizona Public Service Company

3. MAILING ADDRESS **P. O. Box 188**

   Joseph City, AZ 86032

4. EQUIPMENT LOCATION/ADDRESS **4801 Cholla Lake Road**

   Joseph City, Navajo County, AZ 86032

5. FACILITIES OR EQUIPMENT DESCRIPTION **Cholla generating station**

6. THIS PERMIT ISSUED SUBJECT TO THE FOLLOWING ***Conditions as described in the permit revision***

7. ADEQ PEMRIT NUMBER **61713 (Significant Revision to Permit No 53399)** PERMIT CLASS **I**

REVISED PERMIT ISSUED THIS 16th DAY OF October, 2015

SIGNATURE

Eric C. Massey, Director, Air Quality Division

TITLE

SIGNIFICANT PERMIT REVISION DESCRIPTION

This Significant Permit Revision No. 61713 to Operating Permit No. 53399 is proposed to be issued to the Arizona Public Service Company (APS) Cholla Generating Station. The revision incorporates the following changes to the permit:

- Retirement of Unit 2 by April 1, 2016;
- Voluntary emission reductions for Unit 1 for NOx, SO_2, and PM_{10};
- Permanent cessation of coal firing at Units 3 and 4 by April 30, 2025; and
- Optional conversion of Units 1, 3, and 4 to pipeline-quality natural gas fuel by July 31, 2025 with voluntary lower emission limits and an annual capacity factor not to exceed 20 percent.

Attachment "F" is hereby added to Permit No. 53399:

ATTACHMENT "F": SPECIFIC CONDITIONS

Addenda - Significant Revision #61713 to Operating Permit # 53399
For
Arizona Public Service Company – Cholla Generating Station

I. GENERAL

[A.A.C. R18-2-306.A.2]

A. The requirements under this Attachment "F" shall become effective on the date of final action by the U.S. Environmental Protection Agency (EPA), approving Attachment "F" as part of the State Implementation Plan for Arizona, provided that such final EPA action also revokes or rescinds EPA's Federal Implementation Plan (published in 77 Federal Register 72512 (December 5, 2012)), insofar as that Federal Implementation Plan establishes emission limits or other requirements for one or more units of the Cholla Generating Station.

B. Where multiple emission limits, standards, or requirements apply to a unit, the most stringent limit, standard, or requirement shall be applicable.

C. Compliance Schedule

1. Unit 2 shall be permanently retired by no later than April 1, 2016.

2. Units 1, 3, and 4 shall permanently stop burning coal or fuel oil or used oil by April 30, 2025.

3. By July 31, 2025, the Permittee may convert any or all of Units 1, 3, and 4 to natural gas operation.

D. If the Permittee chooses to convert any of the Units 1, 3, and 4 to natural gas operation, these units shall be limited to an annual capacity factor of 20 percent or less.

E. When this Attachment "F" becomes effective in accordance with Condition I.A above, the Regional Haze State Implementation Plan (SIP) and Federal Implementation Plan (FIP) requirements incorporated by Permit Revision No. 60129 will no longer be applicable.

F. Definitions

1. 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.

2. Operating hour means any hour that fossil fuel is fired in the unit.

3. PM_{10} means filterable total particulate matter less than 10 microns and the condensable material in the impingers as measured by Methods 201A and 202.

4. Valid data means data recorded when the CEMS is not out-of-control as defined by 40 CFR Part 75.

G. All reports and notifications under this Section shall be submitted to the EPA Administrator at the following address:

The Director of Enforcement Division
U.S. EPA Region IX
75 Hawthorne Street,
San Francisco, CA 94105

II. REQUIREMENTS FOR UNIT 1

A. Emission Limitations

1. Until the permanent cessation of coal burning or April 30, 2025, whichever is earlier, Unit 1 shall comply with the following emission limits:

   a. Nitrogen Oxides (NO_X)

   The Permittee shall not cause to be discharged into the atmosphere from Steam Boiler Unit 1 any gases that contain NO_X in excess of 0.22 lb/MMBtu heat input, averaged over 30 boiler-operating days.
   [A.A.C. R18-2-306.A.2]

   b. Sulfur Dioxide (SO_2)

   (1) The Permittee shall not cause to be discharged into the atmosphere from Unit 1 any gases that contain SO_2 in excess of 0.15 lb/MMBtu heat input, averaged over 30 boiler-operating days.

   (2) The Permittee shall not cause to be discharged into the atmosphere from Unit 1 any gases that contain SO_2 in excess of 5 percent of the potential combustion concentration (95 percent reduction), averaged over 30 boiler-operating days.
   [A.A.C. R18-2-306.A.2]

c. Particulate Matter less than 10 microns (PM_{10})

The Permittee shall not cause to be discharged into the atmosphere from Unit 1 any gases that contain PM_{10} in excess of 0.015 lb/MMBtu heat input.

[A.A.C. R18-2-306.A.2]

2. Upon conversion of the Unit 1 to natural gas operation, the Permittee shall comply with the following emission limits:

a. Nitrogen Oxides (NO_X)

The Permittee shall not cause to be discharged into the atmosphere any gases that contain NO_X in excess of 0.08 lb/MMBtu heat input, averaged over 30 boiler-operating days.

[A.A.C. R18-2-306.A.2]

b. Sulfur Dioxide (SO_2)

The Permittee shall not cause to be discharged into the atmosphere any gases that contain SO_2 in excess of 0.0006 lb/MMBtu heat input, averaged over 30 boiler-operating days.

[A.A.C. R18-2-306.A.2]

c. Particulate Matter less than 10 microns (PM_{10})

The Permittee shall not cause to be discharged into the atmosphere any gases that contain total PM_{10} in excess of 0.01 lb/MMBtu heat input.

[A.A.C. R18-2-306.A.2]

B. Air Pollution Control Requirements

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 Director and EPA Administrator, which may include, but is not limited to, monitoring results, review of operating and maintenance procedures, and inspection of the unit.*

[A.A.C. R18-2-306.A.3.c and A.A.C. R-18-2-331A.3.e]
[Material Permit Condition indicated by italics and underline]

C. Monitoring Requirements

1. *At all times, the Permittee shall calibrate,* maintain, *and operate CEMS, in full compliance with the requirements found at 40 CFR Part 75, to accurately measure SO_2, NO_X, diluent, and stack gas volumetric flow rate from each unit.*

[A.A.C. R18-2-306.A.3.c and A.A.C R-18-2-331A.3.c]
[Material Permit Condition indicated by italics and underline]

2. *At all times, the Permittee shall calibrate*, maintain, *and operate CEMS, in full compliance with the requirements found at 40 CFR Part 75, to accurately measure SO_2 emissions and diluent at the inlet of the sulfur dioxide control device*.

[A.A.C. R18-2-306.A.3.c and A.A.C R-18-2-331A.3.c]
[Material Permit Condition indicated by italics and underline]

3. All valid CEMS hourly data shall be used to determine compliance with the emission limitations for NO_X and SO_2 in Conditions II.A.1 and II.A.2 for each unit.

[A.A.C. R18-2-306.A.3.c]

4. When the CEMS is out-of-control as defined by Part 75, the CEMS data shall be treated as missing data and not be used to calculate the emission average of the affected unit. Each required CEMS shall obtain valid data for at least 90 percent of the unit operating hours, on an annual basis.

[A.A.C. R18-2-306.A.3.c]

5. The Permittee 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_X and SO_2 pounds per hour measurement and the heat input measurement, and such hourly CEMS monitoring data shall not be bias adjusted. The inlet SO_2 and diluent monitors shall also meet the Quality Assurance/Quality Control (QA/QC) requirements of 40 CFR Part 75. The testing and evaluation of the inlet monitors and the calculations of relative accuracy for lb/hr of NO_X, SO_2, and heat input shall be performed each time the 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_2 monitors.

[A.A.C. R18-2-306.A.3.c]

D. Compliance Requirements

1. Nitrogen Oxides (NO_X)

a. The 30-day rolling average NO_X emission rate shall be calculated for each calendar day, even if the unit is not in operation on that calendar day, in accordance with the following procedure:

[A.A.C. R18-2-306.A.3.c]

(1) Step 1 – sum the hourly pounds of NO_X 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_X emitted over the most recent thirty (30) boiler-operating-day period;

(2) Step 2 – 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;

(3) Step 3 – Divide the total pounds of NO_X emitted from step one

by the total heat input from step two to calculate the 30 day rolling average NO_X emission rate in pounds of NO_X per MMBtu, for each calendar day for the unit.

b. Each 30-day rolling average NO_X 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.

[A.A.C. R18-2-306.A.3.c]

c. If a valid NO_X pounds per hour or heat input is not available for any hour, that heat input and NO_X pounds per hour shall not be used in the calculation of the 30-day rolling average.

[A.A.C. R18-2-306.A.3.c]

2. Sulfur Dioxide (SO_2)

a. The 30-day rolling average SO_2 emission rate shall be calculated in accordance with the following procedure:

[A.A.C. R18-2-306.A.3.c]

(1) Step one – Sum the total pounds of SO_2 emitted from the unit during the current boiler-operating day and the previous twenty-nine (29) boiler-operating days;

(2) 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

(3) Step three – Divide the total number of pounds of SO_2 emitted during the thirty (30) boiler-operating days by the total heat input during the thirty (30) boiler-operating days.

(4) A new 30-day rolling average SO_2 emission rate shall be calculated for each new boiler-operating day.

(5) Each 30-day rolling average SO_2 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.

(6) If a valid SO_2 pounds per hour at the outlet of the FGD system or heat input is not available for any hour for the unit, that heat input and SO_2 pounds per hour shall not be used in the calculation of the 30-day rolling average.

b. The 30-day rolling average SO_2 removal efficiency for each unit shall be calculated as follows:

[A.A.C. R18-2-306.A.3.c]

(1) Step one – Sum the total pounds of SO_2 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

the unit;

(2) Step two – Sum the total pounds of SO_2 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 the unit (for each hour, the total pounds of SO_2 delivered to the inlet of the FGD system shall be calculated by measuring the ratio of the lb/MMBtu SO_2 inlet to the lb/MMBtu SO_2 outlet and multiplying the outlet pounds of SO_2 by that ratio);

(3) Step three – Subtract the outlet SO_2 emissions calculated in step one from the inlet SO_2 emissions calculated in step two;

(4) Step four – Divide the remainder calculated in step three by the inlet SO_2 emissions calculated in step two; and

(5) Step five – Multiply the quotient calculated in step four by 100 to express as percent removal efficiency.

(6) A new 30-day rolling average SO_2 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.

(7) If both a valid inlet and outlet SO_2 lb/MMBtu and an outlet value of lb/hr of SO_2 are not available for any hour, that hour shall not be included in the efficiency calculation.

3. Particulate Matter less than 10 microns (PM_{10})

a. Until permanent cessation of coal burning in Unit 1, the Permittee shall demonstrate compliance with the PM_{10} emission limitations specified in Condition II.A.1.c by conducting annual stack tests. The Permittee shall use EPA Method 5 or Method 5B in 40 CFR Part 60, Appendix A, or Method 5 as described in 40 CFR Part 63, Subpart UUUUU, Table 5 or Method 201A in 40 CFR Part 51, Appendix M for filterable PM_{10} and Method 202 in 40 CFR Part 51, Appendix M for condensable PM_{10}.

[A.A.C. R18-2-312]

b. Within 90 days of conversion to pipeline-quality natural gas, the Permittee shall demonstrate compliance with the PM_{10} emission limitation in Condition II.A.2.c by conducting performance test using the test method specified in Condition III.D.3.a above. After the initial performance test, the Permittee shall demonstrate continuous compliance through use of pipeline-quality natural gas.

[A.A.C. R18-2-312 and A.A.C. R18-2-306.A.3.c]

c. A test protocol shall be submitted to ADEQ a minimum of thirty (30) days prior to the scheduled testing. The protocol shall identify which method(s) will be used to demonstrate compliance.

[A.A.C. R18-2-312]

d. The performance 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.

[A.A.C. R18-2-312]

e. In addition to required stack tests, the Permittee shall monitor particulate emissions for compliance with the emission limitations in accordance with any applicable Compliance Assurance Monitoring (CAM) plan in Attachment "E" of the permit. The averaging time for any other demonstration of PM_{10} compliance or exceedance shall be based on a 6-hour average.

[A.A.C. R18-2-312]

E. Recordkeeping Requirements

The Permittee shall maintain the following records for at least five years:

1. All CEMS data, including the date, place, and time of sampling or measurement; parameters sampled or measured; and results.

[A.A.C. R18-2-306.A.3.c]

2. Daily 30-day rolling emission rates for NO_X and SO_2, and SO_2 removal efficiency, when applicable, for each unit, calculated in accordance with II.D.1 and II.D.2 of this Section.

[A.A.C. R18-2-306.A.3.c]

3. 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.

[A.A.C. R18-2-306.A.3.c]

4. Records of the relative accuracy test for hourly NO_x and SO_2 lb/hr measurement and hourly heat input measurement.

[A.A.C. R18-2-306.A.3.c]

5. Records of all major maintenance activities conducted on the emission units, air pollution control equipment, and CEMS.

[A.A.C. R18-2-306.A.3.c]

6. Any other records required by 40 CFR Part 75

[A.A.C. R18-2-306.A.3.c]

7. If the unit is converted to natural gas operation in 2025, a record of a current valid purchase contract, tariff sheet, transportation contract, or other acceptable documentation specifying the maximum total sulfur content of the pipeline-quality natural gas. This record shall be updated annually.

[A.A.C. R18-2-306.A.4]

F. Reporting Requirements

1. All reports and notifications under this Section shall be submitted to the ADEQ Director and EPA Administrator.

[A.A.C. R18-2-306.A.3.c]

2. Within 15 days of permanent cessation of coal burning in Unit 1, the Permittee shall notify the Director and the EPA Administrator.

[A.A.C. R18-2-306.A.5]

3. If the Permittee chooses to convert Unit 1 to natural gas operation, the Permittee shall notify the Director and the EPA Administrator at least 30 days prior to such conversion.

[A.A.C. R18-2-306.A.5]

4. Within 30 days of every second calendar quarter (i.e., semi-annually), the Permittee shall submit a report that lists the 30-day-rolling emission rate for NO_x and SO_2, and SO_2 removal efficiency calculated in accordance with Conditions II.D.1, II.D.2.a, and II.D.2.b, respectively, including the results of any relative accuracy test audit performed during the two preceding calendar quarters.

[A.A.C. R18-2-306.A.3.c]

5. Within 30 days of conversion to pipeline-quality natural gas, and within 30 days of every second calendar quarter thereafter (i.e., semi-annually), the Permittee shall submit a report that lists the daily 30-day rolling emission rates for NO_x and SO_2 for the unit, calculated in accordance with Conditions II.D.1 and II.D.2.a, respectively, including the results of any relative accuracy test audit performed during the two preceding calendar quarters.

[A.A.C. R18-2-306.A.5]

6. For the purpose of Conditions II.F.4 and 5 above, the Permittee may request, and the Department may authorize in writing, different semi-annual reporting dates to harmonize with other semi-annual reporting requirements in the permit.

[A.A.C. R18-2-306.A.5]

III. REGIONAL HAZE REQUIREMENTS FOR UNITS 2, 3, AND 4

A. Emission Limitations

1. Unit 2

Until April 1, 2016, Unit 2 shall comply with the following emission limits:

a. Nitrogen Oxides (NO_x)

The Permittee shall not cause to be discharged into the atmosphere from Steam Boiler Unit 2 any gases that contain NO_X in excess of 0.30 lb/MMBtu heat input, averaged over 30 boiler-operating days.

[A.A.C. R18-2-306.A.2]

b. Sulfur Dioxide (SO_2)

(1) The Permittee shall not cause to be discharged into the atmosphere from Steam Boiler Unit 2 any gases that contain SO_2 in excess of 0.25 lb/MMBtu heat input, averaged over 30 boiler-operating days.

[A.A.C. R18-2-306.A.2]

(2) The Permittee shall not cause to be discharged into the atmosphere from Steam Boiler Unit 2 any gases that contain SO_2

in excess of 10 percent of the potential combustion concentration (90 percent reduction), averaged over 30 boiler-operating days.

[A.A.C. R18-2-306.A.2]

c. Particulate Matter less than 10 microns (PM_{10})

The Permittee shall not cause to be discharged into the atmosphere from Steam Boiler Unit 2 any gases that contain PM_{10} in excess of 0.025 lb/MMBtu heat input.

[A.A.C. R18-2-306.A.2]

2. Units 3 and 4

a. Until the permanent cessation of coal burning or April 30, 2025, whichever is earlier, Units 3 and 4 shall comply with the following emission limits:

(1) Nitrogen Oxides (NO_X)

The Permittee shall not cause to be discharged into the atmosphere from each unit any gases that contain NO_X in excess of 0.22 lb/MMBtu heat input, averaged over 30 boiler-operating days.

[A.A.C. R18-2-306.A.2]

(2) Sulfur Dioxide (SO_2)

(a) The Permittee shall not cause to be discharged into the atmosphere from each unit any gases that contain SO_2 in excess of 0.15 lb/MMBtu heat input, averaged over 30 boiler-operating days.

[40 CFR 52.145(e)(1)]

(b) The Permittee shall not cause to be discharged into the atmosphere from each unit any gases that contain SO_2 in excess of 5 percent of the potential combustion concentration (95 percent reduction), averaged over 30 boiler-operating days.

[40 CFR 52.145(f)(3)(ii)]

(3) Particulate Matter less than 10 microns (PM_{10})

The Permittee shall not cause to be discharged into the atmosphere from each unit any gases that contain PM_{10} in excess of 0.015 lb/MMBtu heat input.

[40 CFR 52.145(e)(1)]

b. Upon conversion of any of the Units 3 and 4 to natural gas operation, the Permittee shall comply with the following emission limits:

(1) Nitrogen Oxides (NO_X)

The Permittee shall not cause to be discharged into the atmosphere any gases that contain NO_X in excess of 0.08

lb/MMBtu heat input, averaged over 30 boiler-operating days.
[A.A.C. R18-2-306.A.2]

(2) Sulfur Dioxide (SO_2)

The Permittee shall not cause to be discharged into the atmosphere any gases that contain SO_2 in excess of 0.0006 lb/MMBtu heat input, averaged over 30 boiler-operating days.
[A.A.C. R18-2-306.A.2]

(3) Particulate Matter less than 10 microns (PM_{10})

The Permittee shall not cause to be discharged into the atmosphere any gases that contain total PM_{10} in excess of 0.01 lb/MMBtu heat input.
[A.A.C. R18-2-306.A.2]

B. Air Pollution Control Requirements

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 EPA Administrator which may include, but is not limited to, monitoring results, review of operating and maintenance procedures, and inspection of the unit.*
[40 CFR 145(f)(10), A.A.C.R 18-2-331A.3.e]
[Material Permit Condition indicated by italics and underline]

C. Monitoring Requirements

1. *At all times, the Permittee shall calibrate*, maintain, *and operate CEMS, in full compliance with the requirements found at 40 CFR Part 75, to accurately measure SO_2, NO_X, diluent, and stack gas volumetric flow rate from each unit.*
[40 CFR 145(f)(5)(i)(A), A.A.C R-18-2-331A.3.c]
[Material Permit Condition indicated by italics and underline]

2. *At all times, the Permittee shall calibrate*, maintain, *and operate CEMS, in full compliance with the requirements found at 40 CFR Part 75, to accurately measure SO_2 emissions and diluent at the inlet of the sulfur dioxide control device.*
[40 CFR 145(f)(5)(i)(A), A.A.C R-18-2-331A.3.c]
[Material Permit Condition indicated by italics and underline]

3. All valid CEMS hourly data shall be used to determine compliance with the emission limitations for NO_X and SO_2 in Conditions III.A.1.a, III.A.1.b, III.A.2.a(1), III.A.2.a(2), III.A.2.b(1), and III.A.2.b(2) for each unit.
[40 CFR 145(f)(5)(i)(A)]

4. When the CEMS is out-of-control as defined by Part 75, that CEMS data shall be treated as missing data and not be used to calculate the emission average of the affected unit. Each required CEMS shall obtain valid data for at least 90 percent of the unit operating hours, on an annual basis.

[40 CFR 145(f)(5)(i)(A)]

5. The Permittee 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_X and SO_2 pounds per hour measurement and the heat input measurement, and such hourly CEMS monitoring data shall not be bias adjusted. The inlet SO_2 and diluent monitors shall also meet the Quality Assurance/Quality Control (QA/QC) requirements of 40 CFR Part 75. The testing and evaluation of the inlet monitors and the calculations of relative accuracy for lb/hr of NO_X, SO_2, and heat input shall be performed each time the 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_2 monitors.

[40 CFR 145(f)(5)(i)(B)]

D. Compliance Requirements

1. Nitrogen Oxides (NO_X)

a. The 30-day rolling average NO_X emission rate for each unit 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:

[40 CFR 145(f)(5)(ii)(A)]

(1) Step 1 – sum the hourly pounds of NO_X 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_X emitted over the most recent thirty (30) boiler-operating-day period for each coal-fired unit;

(2) Step 2 – 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;

(3) Step 3 – Divide the total pounds of NO_X emitted from step one by the total heat input from step two for each unit to calculate the 30-day rolling average NO_X emission rate in pounds of NO_X per MMBtu, for each calendar day.

b. Each 30-day rolling average NO_X 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.

[40 CFR 145(f)(5)(ii)(A)]

c. If a valid NO_X pounds per hour or heat input is not available for any hour

for a unit, that heat input and NO_X pounds per hour shall not be used in the calculation of the 30-day rolling average.

[40 CFR 145(f)(5)(ii)(C)]

2. Sulfur Dioxide (SO_2)

a. The 30-day rolling average SO_2 emission rate for each unit shall be calculated in accordance with the following procedure:

[40 CFR 145(f)(5)(iii)(A) and (C)]

(1) Step one – Sum the total pounds of SO_2 emitted from the unit during the current boiler-operating day and the previous twenty-nine (29) boiler-operating days;

(2) 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

(3) Step three – Divide the total number of pounds of SO_2 emitted during the thirty (30) boiler-operating days by the total heat input during the thirty (30) boiler-operating days.

(4) A new 30-day rolling average SO_2 emission rate shall be calculated for each new boiler-operating day.

(5) Each 30-day rolling average SO_2 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.

(6) If a valid SO_2 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_2 pounds per hour shall not be used in the calculation of the 30-day rolling average.

b. The 30-day rolling average SO_2 removal efficiency for each unit shall be calculated as follows:

[40 CFR 145(f)(5)(iii)(B) and (D)]

(1) Step one – Sum the total pounds of SO_2 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;

(2) Step two – Sum the total pounds of SO_2 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_2 delivered to the inlet of the FGD system for a unit shall be calculated by measuring the ratio of the lb/MMBtu SO_2 inlet to the lb/MMBtu SO_2 outlet and multiplying the outlet pounds of SO_2 by that ratio);

(3) Step three – Subtract the outlet SO_2 emissions calculated in step one from the inlet SO_2 emissions calculated in step two;

(4) Step four – Divide the remainder calculated in step three by the inlet SO_2 emissions calculated in step two; and

(5) Step five – Multiply the quotient calculated in step four by 100 to express as percent removal efficiency.

(6) A new 30-day rolling average SO_2 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.

(7) If both a valid inlet and outlet SO_2 lb/MMBtu and an outlet value of lb/hr of SO_2 are not available for any hour, that hour shall not be included in the efficiency calculation.

3. Particulate Matter less than 10 microns (PM_{10})

a. Until retirement of Unit 2, and permanent cessation of coal burning in Units 3 and 4, the Permittee shall demonstrate compliance with the PM_{10} emission limitations specified in Condition III.A.1.c and III.A.2.a(3) by conducting annual stack tests. The Permittee shall use EPA Method 5 or Method 5B in 40 CFR Part 60, Appendix A, or Method 5 as described in 40 CFR Part 63, Subpart UUUUU, Table 5 or Method 201A in 40 CFR Part 51, Appendix M for filterable PM_{10}, and Method 202 in 40 CFR Part 51, Appendix M for condensable PM_{10}.

[40 CFR 145(f)(6), A.A.C. R18-2-312]

b. Within 90 days of conversion to pipeline-quality natural gas operation for Units 3 and/or Unit 4, the Permittee shall demonstrate compliance with the PM_{10} emission limitations in Condition III.A.2.b(3) by conducting a performance test in accordance with the test method specified in Condition III.D.3.a above. After completion of the initial performance test, continuous compliance shall be demonstrated through use of pipeline-quality natural gas.

[A.A.C. R18-2-312]

c. A test protocol shall be submitted to ADEQ a minimum of thirty (30) days prior to the scheduled testing. The protocol shall identify which method(s) will be used to demonstrate compliance.

[40 CFR 145(f)(6), A.A.C. R18-2-312]

d. 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.

[40 CFR 145(f)(6), A.A.C. R18-2-312]

e. In addition to required stack tests, the Permittee shall monitor particulate emissions for compliance with the emission limitations in accordance with any applicable Compliance Assurance Monitoring (CAM) plan in

Attachment "E" of the permit. The averaging time for any other demonstration of PM_{10} compliance or exceedance shall be based on a 6-hour average.

[40 CFR 145(f)(6)]

E. Recordkeeping Requirements

The Permittee shall maintain the following records for at least five years:

1. All CEMS data, including the date, place, and time of sampling or measurement; parameters sampled or measured; and results.

[40 CFR 145(f)(7)(i)]

2. Daily 30-day rolling emission rates for NO_x and SO_2, and SO_2 removal efficiency, when applicable, for each unit, calculated in accordance Conditions III.D.1, III.D.2.a, and III.D.2.b of this Section.

[40 CFR 145(f)(7)(ii)]

3. 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.

[40 CFR 145(f)(7)(iii)]

4. Records of the relative accuracy test for hourly NO_X and SO_2 lb/hr measurement and hourly heat input measurement.

[40 CFR 145(f)(7)(iv)]

5. Records of all major maintenance activities conducted on emission units, air pollution control equipment, and CEMS.

[40 CFR 145(f)(7)(v)]

6. Any other records required by 40 CFR Part 75.

[40 CFR 145(f)(7)(vi)]

7. If any of the Units 3 and 4 are converted to natural gas operation in 2025, a record of a current valid purchase contract, tariff sheet, transportation contract, or other acceptable documentation specifying the maximum total sulfur content of the pipeline-quality natural gas. This record shall be updated annually.

[A.A.C. R18-2-306.A.4]

F. Reporting Requirements

1. All reports and notifications under this Section shall be submitted to the ADEQ Director and the EPA Administrator.

[40 CFR 145(f)(8)]

2. The Permittee shall notify the Director and the EPA Administrator within 15 days of the permanent shut down of Unit 2.

[A.A.C. R18-2-306.A.5]

3. Within 15 days of permanent cessation of coal burning coal in Units 3 and 4, the Permittee shall notify the Director and the EPA Administrator.

[A.A.C. R18-2-306.A.5]

4. If the Permittee chooses to convert any of Units 3 and 4 to natural gas operation,

the Permittee shall notify the Director and the EPA Administrator at least 30 days prior to such conversion.

[A.A.C. R18-2-306.A.5]

5. Within 30 days of every second calendar quarter (i.e., semi-annually), the Permittee shall submit a report that lists the 30-day-rolling emission rate for NO_x and SO_2, and SO_2, removal efficiency calculated in accordance with Conditions III.D.1, III.D.2.a, and III.D.2.b, respectively, including the results of any relative accuracy test audit performed during the two preceding calendar quarters.

[40 CFR 145(f)(8)(ii)]

6. Within 30 days after conversion to pipeline-quality natural gas, and within 30 days of every second calendar quarter thereafter (i.e., semi-annually), the Permittee shall submit a report that lists the daily 30-day rolling emission rates for NO_x and SO_2, for each unit, calculated in accordance with Conditions III.D.1 and III.D.2.a, respectively, including the results of any relative accuracy test audit performed during the two preceding calendar quarters.

[A.A.C. R18-2-306.A.5]

7. The Permittee may request, and the Department may authorize in writing, different semi-annual reporting dates to harmonize with other semi-annual reporting under the then-effective permit.

[A.A.C. R18-2-306.A.5]

APPENDIX B

BART Reassessment - Cost of Compliance

B.1 Cost of Compliance for Unit 3

B.1.1 Cost-Effectiveness for Twenty Years of Operation on Coal

Table B-1: Capital and Annualized Cost for NOx Controls for Cholla Unit 3 assuming 20 years of Operation on Coal

Control Option	Capital Cost ($)	Annualized Capital Cost ($/yr)	Annual O&M ($/yr)	Total Annual Cost ($/yr)
OFA (only)[a]	-	-	-	-
LNB+SOFA [a]	$3,848,807	$363,300	$120,000	$483,300
SNCR w/ LNB+SOFA [a]	$19,238,125	$1,815,943	$1,254,500	$3,070,443
SCR w/ LNB+SOFA [a]	$83,461,195	$7,878,146	$1,570,766	$9,448,912

[a] Costs are based on 77 Fed. Reg. 72512, 72548, Table 12 (Dec. 5, 2012).

Table B-2: Emission Reductions for NOx Control Options for Cholla Unit 3 assuming 20 years of Operation on Coal

Control Option	Emission Factor (lb/MMBtu)	Heat Rate (MMBtu/hr) [c]	Annual Capacity Factor (%)	Emission Rate		Emission Reduction (ton/yr)
				(lb/hour)	(ton/yr)	
OFA (only)	0.304	3,480	86	1,058	3,985	-
LNB+SOFA	0.211[a]	3,480	86	734	2,766	1,219
SNCR w/LNB+SOFA	0.158 [b]	3,480	86	551	2,074	1,911
SCR w/LNB+SOFA	0.050	3,480	86	174	655	3,330

[a] Average actual NOx emission rate from June 1, 2009 through December 31, 2013 after the installation of LNB+SOFA
[b] 25% reduction from average actual NOx emission rate
[c] 77 Fed. Reg. 72512, 72548, Table 11 (Dec. 5, 2012)

Table B-3: Average and Incremental Cost Effectiveness for NOx Control Options for Cholla Unit 3 assuming 20 years of Operation on Coal

Control Option	Total Annual Cost ($/yr)	Emission Reduction (ton/yr)	Average Cost Effectiveness ($/ton)	Incremental Total Annual Cost ($/yr) [(a)]	Incremental Emission Reduction (ton/yr) [(a)]	Incremental Cost Effectiveness ($/ton) [(a)]
LNB+SOFA	$483,300	1,219	$396			
SNCR w/ LNB+SOFA	$3,070,443	1,911	$1,607	$2,587,143	691	$3,742
SCR w/ LNB+SOFA	$9,448,912	3,330	$2,838	$8,965,612	2,110	$4,248

[(a)] The incremental cost effectiveness results for SNCR and SCR are based on the emission and cost differences between these technologies and the proposed LNB+SOFA option

B.1.2 BART Reassessment - Eight Years of Operation on Coal and Twelve Years of Operation on Natural Gas

Table B-4: LNB+SOFA Cost Effectiveness with Conversion to Natural Gas in 2025 for Cholla Unit 3

LNB + SOFA Control Costs and Cost Effectiveness Years 1-8			
	Cost and Emission Reductions [(a)]		
	Annual Cost/Tons	Years	Totals
Annualized Capital Cost ($)	$363,300	8	$2,906,400
Annual O&M Costs Years 1-8 ($)	$120,000	8	$960,000
Emission Reduction Years 1-8 (tons)	1,219	8	9,753
Cost Effectiveness, Years 1-8 ($/ton)			$396
LNB + SOFA Costs and Cost Effectiveness Years 9-20			
Annualized Capital Cost Years 9-20 ($)	$363,300	12	$4,359,600
Annual O&M Costs, Years 9-20 ($) [(b)]	$0	12	$0
Emission Reduction Years 9-20 (tons) [(b)]	0	12	0
Cost Effectiveness, Years 9-20 ($/ton)			NA
LNB + SOFA Cost Effectiveness over 20-Year Life			
Annualized Capital Costs ($)			$7,266,000
Annual O&M Costs ($)			$960,000
Total Annual Costs ($)			$8,226,000
Average Annual Costs over 20 Years ($/yr)			$411,300
Emission Reduction (tons)			9,753
Average Emission Reduction over 20 Years (tons/yr)			488
Cost Effectiveness ($/ton)			$843

[(a)] See Tables B-1 and B-2
[(b)] LNB + SOFA installed for coal will not be applicable to natural gas

Table B-5: SNCR Cost Effectiveness with Conversion to Natural Gas in 2025 for Cholla Unit 3

SNCR Control Costs and Cost Effectiveness Years 1-8						
	Total Cost and Emission Reductions [a]			Incremental Cost and Emission Reductions [b]		
	Annual Cost/Tons	Years	Totals	Annual Cost/Tons	Years	Totals
Annualized Capital Cost ($)	$1,815,943	8	$14,527,544	$1,452,643	8	$11,621,144
Annual O&M Costs, Years 1-8 ($)	$1,254,500	8	$10,036,000	$1,134,500	8	$9,076,000
Emission Reduction, Years 1-8 (tons)	1,911	8	15,284	691	8	5,532
Cost Effectiveness, Years 1-8 ($/ton)			$1,607			$3,742
SNCR Costs and Cost Effectiveness Years 9-20						
Annualized Capital Cost, Years 9-20 ($)	$1,815,943	12	$21,791,316	$1,452,643	12	$17,431,716
Annual O&M Costs, Years 9-20 ($)	$300,000	12	$3,600,000	$300,000	12	$3,600,000
Emission Reduction, Years 9-20 (tons)	36.6[c]	12	439	36.6[c]	12	439
Cost Effectiveness, Years 9-20 ($/ton)			$57,841			$47,910
SNCR Cost Effectiveness over 20-Year Life						
Annualized Capital Costs ($)			$36,318,860			$29,052,860
Annual O&M Costs ($)			$13,636,000			$12,676,000
Total Annual Costs ($)			$49,954,860			$41,728,860
Average Annual Costs ($/yr)			$2,497,743			$2,086,443
Emission Reduction (tons)			15,723			5971
Average Annual Emission Reduction (tons/yr)			786			299
Cost Effectiveness ($/ton)			$3,177			$6,989

[a] See Tables B-1 and B-2

[b] Incremental costs and emission reductions are the differences between SNCR in this table and LNB + SOFA in Table B-4

[c] Emissions before control are 243.9 ton/yr (0.08 lb/MMBtu x 3,480 MMBtu/hr x 8.760 hr/yr x 20% x 1 ton/2,000 lb). The emission reduction is assumed to be 15% because the effectiveness of SNCR decreases as the NOx emission rate before control decreases

Table B-6: SCR Cost Effectiveness with Conversion to Natural Gas in 2025 for Cholla Unit 3

SCR Costs and Cost Effectiveness Years 1-8						
	Total Cost and Emission Reductions [a]			Incremental Cost and Emission Reductions [b]		
	Annual Cost/Tons	Years	Totals	Annual Cost/Tons	Years	Totals
Annualized Capital Cost ($)	$7,878,146	8	$63,025,168	$7,514,846	8	$60,118,768
Annual O&M Costs Years 1-8 ($)	$1,570,766	8	$12,566,128	$1,450,766	8	$11,606,128
Emission Reduction Years 1-8 (tons)	3,330	8	26,636	2,110	8	16,884
Cost Effectiveness, Years 1-8 ($/ton)			$2,838			$4,248
SCR Costs and Cost Effectiveness Years 9-20						
Annualized Capital Cost Years 9-20 ($)	$7,878,146	12	$94,537,752	$7,514,846	12	$90,178,152
Annual O&M Costs, Years 9-20 ($)	$350,000	12	$4,200,000	$350,000	12	$4,200,000
Emission Reduction Years 9-20 (tons)	91.5	12	1,098	91.5	12	1,098
Cost Effectiveness, Years 9-20 ($/ton)			$89,925			$85,955
SCR Cost Effectiveness over 20-Year Life						
Total Annualized Capital Costs ($)			$157,562,920			$150,296,920
Total Annual O&M Costs ($)			$16,766,128			$15,806,128
Total Annual Costs ($)			$174,329,048			$166,103,048
Average Annual Costs ($/yr)			$8,716,452			$8,305,152
Total Emission Reduction (tons)			27,734			17,982
Average Annual Emission Reduction (tons/yr)			1,387			899
Cost Effectiveness ($/ton)			$6,286			$9,237

[a] See Tables B-1 and B-2

[b] Incremental costs and emission reductions are the differences between SCR in this table and LNB + SOFA in Table B-4

[c] Emission rate factor before control is 0.08 lb/MMBtu. With SCR, emissions are reduced to 0.05 lb/MMBtu. Therefore, emissions reduction is: (0.08 -0.05) lb/MMBtu x 3,480 MMBtu/hr x 8.760 hr/yr x 20% x 1 ton/2,000 lb = 91.5 tons/yr

B.2 Cost of Compliance for Unit 4

B.2.1 Cost Effectiveness for Twenty Years of Operation on Coal

Table B-7: Capital and Annualized Cost for NOx Controls for Cholla Unit 4 assuming 20 years of Operation on Coal

Control Option	Capital Cost ($)	Annualized Capital Cost ($/yr)	Annual O&M ($/yr)	Total Annual Cost ($/yr)
OFA (only) [a]	-	-	-	-
LNB+SOFA [a]	$5,334,618	$503,550	$170,000	$673,550
SNCR w/ LNB+SOFA [a]	$24,885,052	$2,348,973	$1,737,393	$4,086,366
SCR w/ LNB+SOFA [a]	$119,083,832	$11,240,671	$2,350,182	$13,590,853

[a] Costs are based on 77 Fed. Reg. 72512, 72547, Table 12 (Dec. 5, 2012)

Table B-8: Emission Reductions for NOx Control Options for Cholla Unit 4 assuming 20 years of Operation on Coal

Control Option	Emission Factor (lb/MMBtu)	Heat Rate [c] (MMBtu/hr)	Annual Capacity Factor (%)	Emission Rate		Emission Reduction (ton/yr)
				(lb/hour)	(ton/yr)	
OFA (only)	0.296	4,399	93	1302	5,304	-
LNB+SOFA	0.20 [a]	4,399	93	871	3,548	1,756
SNCR w/ LNB+SOFA	0.15 [b]	4,399	93	653	2,661	2,643
SCR w/ LNB+SOFA	0.050	4,399	93	220	896	4,408

[a] Average actual NOx emission rate from May 1, 2008 through December 31, 2013 after the installation of LNB+SOFA. Expected emission rate with a 30-day rolling average limit of 0.22 lb/MMBtu
[b] 25 percent reduction from average actual NOx emission rate
[c] 77 Fed. Reg.72512, 72548, Table 11 (Dec. 5, 2012)

Table B-9: Average and Incremental Cost Effectiveness for NOx Control Options for Cholla Unit 4 assuming 20 years of Operation on Coal

Control Option	Total Annual Cost	Emission Reduction	Average Cost Effectiveness	Incremental Total Annual Cost	Incremental Emission Reduction	Incremental Cost Effectiveness
	($/yr)	(ton/yr)	($/ton)	($/yr)	(ton/yr)	($/ton)
LNB+SOFA	$673,550	1,756	$384	-	-	-
SNCR w/LNB+SOFA	$4,086,366	2,643	$1,546	$3,412,816	887	$3,848
SCR w/ LNB+SOFA	$13,590,853	4,408	$3,083	$12,917,303	2,652	$4,871

[(a)] *The incremental cost effectiveness results for SNCR and SCR are based on the emission and cost differences between these technologies and the proposed LNB +SOFA option*

B.2.2 BART Reassessment - Eight Years of Operation on Coal and Twelve Years of Operation on Natural Gas

Table B-10: LNB+SOFA Cost Effectiveness with Conversion to Natural Gas in 2025 for Cholla Unit 4

LNB + SOFA Costs and Cost Effectiveness Years 1-8			
	Cost and Emission Reductions (a)		
	Annual	Years	Totals
Annualized Capital Cost ($)	$503,550	8	$4,028,400
Annual O&M Costs Years 1-8 ($)	$170,000	8	$1,360,000
Emission Reduction Years 1-8 (tons)	1,756	8	14,048
Cost Effectiveness, Years 1-8 ($/ton)			$384
LNB + SOFA Costs and Cost Effectiveness Years 9-20			
Annualized Capital Cost Years 9-20 ($)	$503,550	12	$6,042,600
Annual O&M Costs, Years 9-20 ($) (b)	$0	12	$0
Emission Reduction Years 9-20 (tons) (b)	0	12	0
Cost Effectiveness, Years 9-20 ($/ton)			NA
LNB + SOFA Cost Effectiveness over 20-Year Life			
Total Annualized Capital Costs ($)			$10,071,000
Total Annual O&M Costs ($)			$1,360,000
Total Annual Costs ($)			$11,431,000
Average Annual Costs over 20 Years ($/yr)			$571,550
Total Emission Reduction (tons)			14,048
Average Emission Reduction over 20 Years (tons/yr)			702
Cost Effectiveness ($/ton)			$814

[(a)] *See Tables B-7 and B-8*
[(b)] *LNB + SOFA installed for coal will not be applicable to natural gas*

Table B-11: SNCR Cost Effectiveness with Conversion to Natural Gas in 2025 for Cholla Unit 4

SNCR Costs and Cost Effectiveness Years 1-8						
	Total Cost and Emission Reductions (a)			Incremental Cost and Emission Reductions (b)		
	Annual Cost/Tons	Years	Totals	Annual Cost/Tons	Years	Totals
Annualized Capital Cost ($)	$2,348,973	8	$18,791,784	$1,845,423	8	$14,763,384
Annual O&M Costs Years 1-8 ($)	$1,737,393	8	$13,899,144	$1,567,393	8	$12,539,144
Emission Reduction Years 1-8 (tons)	2,643	8	21,144	887	8	7,096
Cost Effectiveness, Years 1-8 ($/ton)			$1,546			$3,848
SNCR Costs and Cost Effectiveness Years 9-20						
Annualized Capital Cost Years 9-20 ($)	$2,348,973	12	$28,187,676	$1,845,423	12	$22,145,076
Annual O&M Costs, Years 9-20 ($)	$400,000	12	$4,800,000	$400,000	12	$4,800,000
Emission Reduction Years 9-20 (tons)	46.2	12	554	46.2	12	554
Cost Effectiveness, Years 9-20 ($/ton)			$59,502			$48,602
SNCR Average Cost Effectiveness over 20-Year Life						
Total Annualized Capital Costs ($)			$46,979,460			$36,908,460
Total Annual O&M Costs ($)			$18,699,144			$17,339,144
Total Costs ($)			$65,678,604			$54,247,604
Average Annual Costs ($/yr)			$3,283,930			$2,712,380
Total Emission Reduction (tons)			21,699			7,650
Average Annual Emission Reduction (tons/yr)			1,085			383
Cost Effectiveness ($/ton)			$3,027			$7,091

(a) See Tables B-7 and B-8

(b) Incremental costs and emission reductions are the differences between SNCR in this table and LNB + SOFA in Table B-10

(c) Emissions before control are 308.3 ton/yr (0.08 lb/MMBtu x 4,399 MMBtu/hr 8.760 hr/yr x 20% x 1 ton/2,000 lb). The emission reduction is 15% because the effectiveness of SNCR decreases as the NOx emission rate before control decreases

Table B-12: SCR Cost Effectiveness with Conversion to Natural Gas in 2025 for Cholla Unit 4

SCR Costs and Cost Effectiveness Years 1-8						
	Total Cost and Emission Reductions [a]			Incremental Cost and Emission Reductions [b]		
	Annual Cost/Tons	Years	Totals	Annual Cost/Tons	Years	Totals
Annualized Capital Cost ($)	$11,240,671	8	$89,925,368	$10,737,121	8	$85,896,968
Annual O&M Costs Years 1-8 ($)	$2,350,182	8	$18,801,456	$2,180,182	8	$17,441,456
Emission Reduction Years 1-8 (tons)	4,408	8	35,264	2,652	8	21,216
Cost Effectiveness, Years 1-8 ($/ton)			$3,083			$4,871
SCR Costs and Cost Effectiveness Years 9-20						
Annualized Capital Cost Years 9-20 ($)	$11,240,671	12	$134,888,052	$10,737,121	12	$128,845,452
Annual O&M Costs, Years 9-20 ($)	$500,000	12	$6,000,000	$500,000	12	$6,000,000
Emission Reduction Years 9-20 (tons)	116 [C]	12	1,387	116 [C]	12	1,387
Cost Effectiveness, Years 9-20 ($/ton)			$101,563			$97,207
SCR Average Cost Effectiveness over 20-Year Life						
Total Annualized Capital Costs ($)			$224,813,420			214,742,420
Total Annual O&M Costs ($)			$24,801,456			23,441,456
Total Costs ($)			$249,614,876			238,183,876
Average Annual Costs ($/yr)			$12,480,744			11,909,194
Total Emission Reduction (tons)			36,652			22,603
Average Annual Emission Reduction (tons/yr)			1,833			1,130
Cost Effectiveness ($/ton)			$6,810			$10,539

[a] *See Tables B-7 and B-8*

[b] *Incremental costs and emission reductions are the differences between SCR in this table and LNB + SOFA in Table B-10*

[c] *Emission rate factor before control is 0.08 lb/MMBtu. With SCR, emissions are reduced to 0.05 lb/MMBtu. Therefore, emissions reduction is: (0.08 -0.05) lb/MMBtu x 4,399 MMBtu/hr x 8.760 hr/yr x 20% x 1 ton/2,000 lb = 116 tons/yr*

Appendix C

Modeled Exhaust Parameters and Emission Rates Used in BART Reassessment

Table C-1: Modeled Stack Exhaust Parameters for Coal-Firing

Unit	Fuel	GEP Creditable Stack Height (m)	Stack Elevation (m)	Stack Diameter (m)	Stack Temperature (K)	Exit Velocity (m/s)
Unit 1	Coal	76.20	1533	3.43	322.0	20.73
Unit 2&3 Merged	Coal	144.81	1530	6.88	396.0	29.60
Unit 3	Coal	144.81	1530	5.23	322.0	22.25
Unit 4	Coal	167.64	1530	5.85	324.0	23.50

Table C-2: Cholla Unit 1 NOx Emissions Data Estimates for Modeling

CAMD Historic Emissions Data, 2001-2003 [a]			
Annual Ave lb/MMBtu	Max Rate 24 hr lb/hr for Modeling		Model Input Emission Rate (g/s)
	lb/hr	Date	
0.371	683.9	5/6/2001	86.17
Expected Annual LNB/OFA Rate w ith a 30-Day Rolling Average Limit of 0.22 lb/MMBtu [b]			
Annual Ave lb/MMBtu	Reduction from Baseline Year	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.201	45.8%	370.5	46.68
SNCR + LNB/OFA Rates (as a Percent of LNB/OFA Rates) [c]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.151	25.0%	277.9	35.01
SCR + LNB/OFA Rates (as a Percent of LNB/OFA Rate) [d]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input EmissionRate (g/s)
0.050	75.1%	92.1	11.61
Natural Gas Rate (as a Percent of LNB/OFA Rate) [e]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.080	60.2%	147.4	18.57

Notes:

[a] 2001-2003 data is used to identify the maximum 24-hour emission rate.

[b] Expected annual emission rate, based on actaul emissions from 11/01/2007 through 12/31/2013, is projected at 0.201 lb/MMBtu, which is a 45.8% reduction from 2001 annual rate. The 2001 hourly rate is reduced by this amount for modeling the LNB/OFA scenarios.

[c] Given an annual LNB/OFA rate of 0.201, SNCR is expected to reduce the LNB/OFA emissions by 25%. The hourly LNB/OFA rate for modeling is reduced by this amount to reflect SNCR modeling.

[d] An annual SCR rate of 0.050 lb/MMBtu is a 75.1% reduction from the annual LNB/OFA rate. The hourly LNB/OFA rate is reduced by this amount to reflect the modeling for the SCR case.

[e] An annual Gas rate of 0.080 lb/MMBtu is a 60.2% reduction from the annual LNB/OFA rate. The hourly LNB/OFA rate is reduced by this amount to reflect the modeling for the gas conversion case. This is not a BART case but will be included in a supplemental analysis.

Table C-3: Cholla Unit 2 NOx Emissions Data Estimates for Modeling

CAMD Historic Emissions Data, 2001-2003 [a]			
Annual Ave lb/MMBtu	Max Rate 24 hr lb/hr for Modeling		Model Input Emission Rate (g/s)
	lb/hr	Date	
0.335	1,629.8	7/20/2001	205.35
Expected Annual LNB/OFA Rate w ith a 30-Day Rolling Average Limit of 0.22 lb/MMBtu [b]			
Annual Ave lb/MMBtu	Reduction from Baseline Year	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.299	10.8%	1,454.2	183.23
SNCR + LNB/OFA Rates (as a Percent of LNB/OFA Rates) [c]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.224	25.0%	1,090.7	137.42
SCR + LNB/OFA Rates (as a Percent of LNB/OFA Rate) [d]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate forModeling	Model Input Emission Rate (g/s)
0.050	83.3%	243.2	30.64
Natural Gas Rate (as a Percent of LNB/OFA Rate) [e]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.080	73.2%	389.1	49.02

Notes:

[a] 2001-2003 data is used to identify the maximum 24-hour emission rate.

[b] Expected annual emission rate, based on actaul emissions from 03/01/2008 through 12/31/2013, is projected at 0.299 lb/MMBtu, which is a 10.4% reduction from 2001 annual rate. The 2001 hourly rate is reduced by this amount for modeling the LNB/OFA scenarios.

[c] Given an annual LNB/OFA rate of 0.299, SNCR is expected to reduce the LNB/OFA emissions by 25%. The hourly LNB/OFA rate for modeling is reduced by this amount to reflect SNCR modeling.

[d] An annual SCR rate of 0.050 lb/MMBtu is a 76.3% reduction from the annual LNB/OFA rate. The hourly LNB/OFA rate is reduced by this amount to reflect the modeling for the SCR case.

[e] An annual Gas rate of 0.080 lb/MMBtu is a 62.1% reduction from the annual LNB/OFA rate. The hourly LNB/OFA rate is reduced by this amount to reflect the modeling for the gas conversion case. This is not a BART case but will be included in a supplemental analysis.

Table C-4: Cholla Unit 3 NOx Emissions Data Estimates for Modeling

CAMD Historic Emissions Data, 2001-2003 [a]			
Annual Ave lb/MMBtu	Max Rate 24 hr lb/hr for Modeling		Model Input Emission Rate (g/s)
	lb/hr	Date	
0.317	1,199.7	9/11/2002	151.16
Expected Annual LNB/OFA Rate with a 30-Day Rolling Average Limit of 0.22 lb/MMBtu [b]			
Annual Ave lb/MMBtu	Reduction from Baseline Year	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.211	33.4%	798.5	100.61
SNCR + LNB/OFA Rates (as a Percent of LNB/OFA Rates) [c]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.158	25.0%	598.9	75.46
SCR + LNB/OFA Rates (as a Percent of LNB/OFA Rate) [d]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.050	76.3%	189.2	23.84
Natural Gas Rate (as a Percent of LNB/OFA Rate) [e]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.080	62.1%	302.8	38.15

Notes:

[a] 2001-2003 data is used to identify the maximum 24-hour emission rate.

[b] Expected annual emission rate is projected at 0.211 lb/MMBtu, which is a 33.4% reduction from 2002 annual rate. The 2002 hourly rate is reduced by this amount for modeling the LNB/OFA scenarios.

[c] Given an annual LNB/OFA rate of 0.211, SNCR is expected to reduce the LNB/OFA emissions by 25%. The hourly LNB/OFA rate for modeling is reduced by this amount to reflect SNCR modeling.

[d] An annual SCR rate of 0.050 lb/MMBtu is a 76.3% reduction from the annual LNB/OFA rate. The hourly LNB/OFA rate is reduced by this amount to reflect the modeling for the SCR case.

[e] An annual Gas rate of 0.080 lb/MMBtu is a 62.1% reduction from the annual LNB/OFA rate. The hourly LNB/OFA rate is reduced by this amount to reflect the modeling for the gas conversion case. This is not a BART case but will be included in a supplemental analysis.

Table C-5: Cholla Unit 4 NOx Emissions Data Estimates for Modeling

CAMD Historic Emissions Data, 2001-2003 [a]			
Annual Ave lb/MMBtu	Max Rate 24 hr lb/hr for Modeling		Model Input Emission Rate (g/s)
	lb/hr	Date	
0.322	1,771.7	8/13/2003	223.23
Expected Annual LNB/OFA Rate w ith a 30-Day Rolling Average Limit of 0.22 lb/MMBtu [b]			
Annual Ave lb/MMBtu	Reduction from Baseline Year	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.200	37.9%	1,100.8	138.69
SNCR + LNB/OFA Rate (as a Percent of LNB/OFA Rate) [c]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.150	25.0%	825.6	104.02
SCR + LNB/OFA Rate (as a Percent of LNB/OFA Rate) [d]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.050	75.0%	275.2	34.67
Natural Gas Rate (as a Percent of LNB/OFA Rate) [e]			
Annual Ave lb/MMBtu	Reduction from LNB/OFA Rate	Max lb/Hour Rate for Modeling	Model Input Emission Rate (g/s)
0.080	60.0%	440.3	55.48

Notes:

[a] 2001-2003 data is used to identify the maximum 24-hour emission rate

[b] Expected annual emission rate is projected at 0.20 lb/MMBtu, which is a 37.9% reduction from 2003 annual rate. The 2003 hourly rate is reduced by this amount for modeling the LNB/OFA scenarios.

[c] Given an annual LNB/OFA rate of 0.20, SNCR is expected to reduce the LNB/OFA emissions by 25%. The hourly LNB/OFA rate for modeling is reduced by this amount to reflect SNCR modeling.

[d] An annual SCR rate of 0.050 lb/MMBtu is a 75% reduction from the annual LNB/OFA rate. The hourly LNB/OFA rate is reduced by this amount to reflect the modeling for the SCR case.

[e] An annual Gas rate of 0.080 lb/MMBtu is 60% percent reduction from the annual LNB/OFA rate. The hourly LNB/OFA rate is reduced by this amount to reflect the modeling for the gas conversion case. This is not a BART case but will be included in a supplemental analysis.

Table C-6: Cholla SO_2 Emissions Data Estimates for Modeling

BART Baseline Emissions

Unit ID	Calculated Max 24 hr lb/MMBtu	Max Rate 24 hr lb/hr for Modeling		Heat Input on Max Day	Re- calculated Emissions	Previous model runs Emissions
	lb/MMBtu	lb/hr	Date	MMBtu/hr	g/s	g/s
Unit 1	0.3878	486.3	5/3/2002	1,254	61.28	61.28
Unit 2	0.5024	1,630.4	3/12/2001	3,245	205.43	205.43
Unit 3	0.9609	2,931.2	4/19/2001	3,050	369.32	301.64
Unit 4	0.7623	3,134.8	3/2/2002	4,112	394.98	352.40

BART LNB/OFA, SNCR and SCR Options

Unit ID	Max 24 hr lb/MMBtu	Max Rate 24 hr lb/hr for Modeling		Heat Input on Modeled Day	Re- calculated Emissions	Previous model runs Emissions
	lb/MMBtu	lb/hr	Date	MMBtu/hr	g/s	g/s
Unit 1 [(a)]	0.3878	486.3		1,254	61.28	28.23
Unit 2	0.0000	0.0000		0.0000	0.0000	57.12
Unit 3	0.1500	522.0		3,480 [(b)]	65.77	65.77
Unit 4	0.1500	659.9		4,399 [(b)]	83.14	83.14

[(a)] Non-BART source, emissions are assumed to be the same as the baseline.
[(b)] Heat input/rate is consistent with EPA BART rule (Table 11, 77 FR 72548).

Post 2025 (not a BART case) Natural Gas

Unit ID	Max 24 hr lb/MMBtu	Max Rate 24 hr lb/hr for Modeling		Heat Input on Modeled Day	Re- calculated Emissions	Previous model runs Emissions
	lb/MMBtu	lb/hr	Date	MMBtu/hr	g/s	g/s
Unit 1	0.0006	0.846		1,411 [(c)]	0.107	0.110
Unit 2	0.0000	0.0000		0.0000	0.000	0.000
Unit 3	0.0006	2.088		3,480	0.263	0.263
Unit 4	0.0006	2.639		4,399	0.333	0.333

[(c)] Maximum daily heat input in the 2001 to 2003 period, 05/13/2001

Table C-7: Cholla PM10 Emissions Data Estimates for Modeling

BART Baseline Emissions

Unit ID	Max 24 hr lb/MMBtu	Max Rate 24 hr lb/hr for Modeling	Maximum 24-hr Heat Input		Re- calculated Emissions	Previous model runs Emissions
	lb/MMBtu	lb/hr	MMBtu/hr	Date	g/s	g/s
Unit 1	0.030 [a]	42.32	1,411	5/13/2001	5.33	5.65
Unit 2	0.026 [a]	89.86	3,456	5/10/2001	11.32	9.90
Unit 3	0.021 [a]	66.17	3,151	5/21/2001	8.34	9.21
Unit 4	0.031 [a]	140.46	4,531	12/28/2003	17.70	17.18

[a] Emission rate provided by APS

BART LNB/OFA, SNCR and SCR Options

Unit ID	Max 24 hr lb/MMBtu	Max Rate 24 hr lb/hr for Modeling	Maximum 24-hr Heat Input		Re- calculated Emissions	Previous model runs Emissions
	lb/MMBtu	lb/hr	MMBtu/hr		g/s	g/s
Unit 1 [a]	0.0300	42.3	1,411		5.33	2.82
Unit 2	0.0000	0.0000	0.0000		0.0000	5.71
Unit 3	0.0150	52.2	3,480 [b]		6.58	6.58
Unit 4	0.0150	66.0	4,399 [b]		8.31	8.31

[a] Non-BART source, emissions are assumed to be the same as the baseline.
[b] Heat input/rate is consistent with EPA BART rule (77 Fed. Reg. 72548, Table 11).

Post 2025 (not a BART case) Natural Gas - PM10total

Unit ID	Max 24 hr lb/MMBtu	Max Rate 24 hr lb/hr for Modeling	Maximum 24-hr Heat Input		Re- calculated Emissions	Previous model runs Emissions
	lb/MMBtu	lb/hr	MMBtu/hr		g/s	g/s
Unit 1	0.0100	14.108	1,411		1.78	1.88
Unit 2	0.0000	0.0000	0.0000		-	0.00
Unit 3	0.0100	34.800	3,480		4.38	4.38
Unit 4	0.0100	43.990	4,399		5.54	5.54

Table C-8: 2001-2003 Baseline Emissions

Unit	Fuel	NOx Controls	NOx Max Daily	SO2 Max Daily	PM10 filt Emission	Max. Daily Heat Input for PM10	PM10 filt	NOx	SO2	PM	PMC	PMF	EC	SO4	SOA
			lb/hr	lb/hr	lb/MMBtu	MMBtu/hr	lb/hr	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
Unit 1	Coal	pre-LNB	684 [a]	486 [b]	0.030 [c]	1,411 [d]	42.32	86.2	61.3	5.33	1.52 [e]	3.67 [e]	0.14 [e]	0.60 [e]	0.15 [e]
Unit 2	Coal	pre-LNB	1,630 [a]	1,630 [b]	0.026 [c]	3,456 [d]	89.86	205.3	205.4	11.32	3.23 [e]	7.79 [e]	0.30 [e]	1.27 [e]	0.32 [e]
Unit 3	Coal	pre-LNB	1,200 [a]	2,931 [b]	0.021 [c]	3,151 [d]	66.17	151.2	369.3	8.34	4.63 [f]	3.57 [f]	0.14 [f]	7.29 [f]	1.82 [f]
U2+3		pre-LNB						356.5	574.8	19.66	7.87	11.36	0.44	8.56	2.14
Unit 4	Coal	pre-LNB	1,772 [a]	3,135 [b]	0.031 [c]	4,531 [d]	140.46	223.2	395.0	17.70	9.83 [g]	7.57 [g]	0.29 [g]	5.53 [g]	1.38 [g]

[a] Maximum NOx daily 24 hour actual emissions based on Part 75 monitoring data for the 2001 - 2003 period. Unit 1 (05/06/01), Unit 2 (07/20/01), Unit 3 (09/11/02), and Unit 4 (08/13/03).

[b] Maximum SO2 daily 24 hour actual emissions based on Part 75 monitoring data for the 2001 - 2003 period. Unit 1 (05/03/02), Unit 2 (03/12/01), Unit 3 (04/19/01), and Unit 4 (03/02/02).

[c] Maximum lb/MMBtu filterable PM10 emission rates provided by APS and PacifiCorp.

[d] Maximum daily 24 hour heat input based on Part 75 monitoring data for the 2001 - 2003 period. Unit 1 (05/13/01), (Unit 2 (05/10/01), Unit 3 (05/21/01), and Unit 4 (12/28/03).

[e] PM speciation based on the National Park Service spreadsheet for coal-fired boilers with a wet scrubber http://www.nature.nps.gov/air/permits/ect/docs/coalBoiler/2006FinalDryBottomPCScrubberPmSpeciationProfile.xls

[f] PM speciation based on the National Park Service spreadsheet for coal-fired boilers with ESP http://www.nature.nps.gov/air/permits/ect/docs/coalBoiler/2006FinalDryBottomPC_ESPpmSpeciationProfile.xls

[g] PM speciation based on the National Park Service spreadsheet for coal-fired boilers with FGD+ESP http://www.nature.nps.gov/air/permits/ect/docs/coalBoiler/2006FinalDryBottomPC_FGD_ESPpmSpeciationProfile.xls

Table C-9: BART Option 1: Unit 2 Shutdown, LNB & SOFA on Units 3 and 4

Unit	Fuel	NOx Controls	NOx Max Daily	Max. Daily Heat Input for SO2 and PM	SO2 Emission Factor	SO2 Max Daily	PM10 filt Emission Factor	PM10 filt Max Daily	NOx	SO2	PM	PMC	PMF	EC	SO4	SOA
			lb/hr	lb/hr	lb/hr	lb/hr	lb/MMBtu	lb/hr	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
Unit 1 [a]	Coal	Pre-LNB	684	NA	NA	486.33	NA	42.32	86.18	61.28	5.33	1.52	3.67	0.14	0.60	0.15
Unit 2	Shutdown		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unit 3	Coal	LNB & SOFA	799 [b]	3,480 [c]	0.150 [d]	522.0	0.015 (d)	52.20	100.61	65.77	6.58	3.29 [e]	3.17 [e]	0.12 [e]	5.55 [e]	1.39 [e]
Unit 4	Coal	LNB & SOFA	1,101 [b]	4,399 [c]	0.150 [d]	659.9	0.015 (d)	65.99	138.70	83.14	8.31	4.16 [e]	4.00 [e]	0.15 [e]	7.01 [e]	1.75 [e]

[a] Unit 1 is not BART eligible. Emissions are assumed to be the same as baseline emissions in Table C-8.

[b] See Table C-4 and C-5.

[c] Heat rate is consistent with EPA BART rule (Table 11, 77 FR 72548).

[d] EPA BART rule (Table 1, 77 FR 72515).

[e] PM speciation based on the National Park Service spreadsheet for coal-fired boilers with FGD+FF
http://www.nature.nps.gov/air/permits/ect/docs/coalBoiler/2006FinalDryBottomPC_FGD_FFpmSpeciationProfile.xls

Table C-10: BART Option 2: Unit 2 Shutdown, LNB & SOFA and SNCR on Units 3 and 4

Unit	Fuel	NOx Controls	NOx Max Daily	Max. Daily Heat Input for SO2 and PM	SO2 Emission Factor	SO2 Max Daily	PM10 filt Emission Factor	PM10 filt Max Daily	NOx	SO2	PM	PMC	PMF	EC	SO4	SOA
			lb/hr	lb/hr	lb/hr	lb/hr	lb/MMBtu	lb/hr	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
Unit 1 [a]	Coal	Pre-LNB	684	NA	NA	486.33	NA	42.32	86.18	61.28	5.33	1.52	3.67	0.14	0.60	0.15
Unit 2	Shutdown		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unit 3	Coal	LNB & SOFA and SNCR	599 [b]	3,480 [c]	0.150 [d]	522.0	0.015 [d]	52.20	75.46	65.77	6.58	3.29 [e]	3.17 [e]	0.12 [e]	5.55 [e]	1.39 [e]
Unit 4	Coal	LNB & SOFA and SNCR	826 [b]	4,399 [c]	0.150 [d]	659.9	0.015 [d]	65.99	104.02	83.14	8.31	4.16 [e]	4.00 [e]	0.15 [e]	7.01 [e]	1.75 [e]

[a] Unit 1 is not BART eligible. Emissions are assumed to be the same as baseline emissions in Table C-8.

[b] See Table C-4 and C-5.

[c] Heat rate is consistent with EPA BART rule (Table 11, 77 FR 72548).

[d] EPA BART rule (Table 1, 77 FR 72515).

[e] PM speciation based on the National Park Service spreadsheet for coal-fired boilers with FGD+FF

http://www.nature.nps.gov/air/permits/ect/docs/coalBoiler/2006FinalDryBottomPC_FGD_FFpmSpeciationProfile.xls

Table C-11: BART Option 3: Unit 2 Shutdown, LNB & SOFA and SCR on Units 3 and 4

Unit	Fuel	NOx Controls	NOx Max Daily	Max. Daily Heat Input for SO2 and	SO2 Emission Factor	SO2 Max Daily	PM10 filt Emission Factor	PM10 filt Max Daily	NOx	SO2	PM	PMC	PMF	EC	SO4	SOA
			lb/hr	lb/hr	lb/hr	lb/hr	lb/MMBtu	lb/hr	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
Unit 1 [a]	Coal	Pre-LNB	684	NA	NA	486.33	NA	42.32	86.18	61.28	5.33	1.52	3.67	0.14	0.60	0.15
Unit 2	Shutdown		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unit 3	Coal	LNB & SOFA and SCR	189 [b]	3,480 [c]	0.150 [d]	522.0	0.015 [d]	52.20	23.84	65.77	6.58	3.29 [e]	3.17 [e]	0.12 [e]	5.55 [e]	1.39 [e]
Unit 4	Coal	LNB & SOFA and SCR	275 [b]	4,399 [c]	0.150 [d]	659.9	0.015 [d]	65.99	34.67	83.14	8.31	4.16 [e]	4.00 [e]	0.15 [e]	7.01 [e]	1.75 [e]

[a] Unit 1 is not BART eligible. Emissions are assumed to be the same as baseline emissions in Table C-8.

[b] See Table C-4 and C-5.

[c] Heat rate is consistent with EPA BART rule (Table 11, 77 FR 72548).

[d] EPA BART rule (Table 1, 77 FR 72515).

[e] PM speciation based on the National Park Service spreadsheet for coal-fired boilers with FGD+FF

http://www.nature.nps.gov/air/permits/ect/docs/coalBoiler/2006FinalDryBottomPC_FGD_FFpmSpeciationProfile.xls

Appendix D

Supplemental Annual Emissions Analysis for Long-Term Benefits of the BART Reassessment

D-1 Overview of Approach

ADEQ conducted an analysis comparing the long-term emissions expectations during 2016-2046 for the relevant pollutants (PM_{10}, SO_2, and NOx) under the control strategies listed in this Cholla BART Reassessment and the prescribed control measures in the applicable SIP or FIP. ADEQ selected Year 2016 as the starting year for comparison purposes because, prior to 2016, there is no difference in PM_{10}, SO_2, and NOx emissions between the Cholla BART Reassessment and the application SIP or FIP.

The following comparisons are made:

1. NOx annual and cumulative emission analysis for EPA FIP and the Cholla BART Reassessment (Section D-2)

2. PM_{10} annual and cumulative emission analysis for the 2011 State of Arizona's SIP ("2011 AZ SIP") and the Cholla BART Reassessment (Section D-3), and

3. SO_2 annual and cumulative emission analysis for the 2011 AZ SIP and the Cholla BART Reassessment (Section D-4)

D-2 Annual NO_X Emission Calculations

D-2-1 NOx Emissions - Cholla BART Reassessment

Emission factors and annual capacity factors for the Cholla BART Reassessment are shown in Table D-1.

Table D-1: Annual NOx Emission Calculations for Cholla BART Reassessment

2016: LNB and SOFA, Unit 2 Shutdown by April 1, 2016

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.201 [1]	1494 [2]	86% [2]	1,131
Unit 2	0.299 [1]	3,022 [3]	91% [3]	900 [4]
Unit 3	0.211 [1]	3,480 [3]	86% [3]	2,766
Unit 4	0.198 [1]	4,399 [3]	93% [3]	3,548

[1] Average actual emission factors are from the installation of LNB and SOFA through the end of 2013.

[2] Heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.

[3] Heat input and annual capacity factors for Units 2, 3 and 4 are taken from EPA FIP FR 72548 Table 11, dated December 5, 2012.

[4] NOx emission numbers for Unit 2 are based on the operation of the unit until April 1, 2016.

2017 – 2025: LNB+SOFA, Unit 2 Shutdown

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.201 [1]	1494 [2]	86% [2]	1,131
Unit 2				0
Unit 3	0.211 [1]	3,480 [3]	86% [3]	2,766
Unit 4	0.198 [1]	4,399 [3]	93% [3]	3,548

[1] Average actual emission factors are from the installation of LNB and SOFA through the end of 2013.

[2] Heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.

[3] Heat input and annual capacity factors for Units 2, 3 and 4 are taken from EPA FIP FR 72548 Table 11, dated December 5, 2012.

2026- 2046: Units 1, 3 and 4 on Natural Gas, Unit 2 Shutdown

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.080 [1]	1,494 [1]	20% [1]	105
Unit 2				0
Unit 3	0.080 [1]	3,480 [2]	20% [1]	244
Unit 4	0.080 [1]	4,399 [2]	20% [1]	308

[1] Heat input and annual capacity factor are based on the information in Cholla application.

[2] Heat input for Units 3 and 4 are taken from EPA FIP FR 72548 Table 11, dated December 5, 2012.

Annual NOx emissions for each year as well as cumulative emissions for BART Reassessment are presented in Table D-2.

Table D-2: Cholla BART Reassessment Annual NOx Emissions for 2016 through 2046 (tons)

Year	Unit 1	Unit 2	Unit 3	Unit 4	SUM	CUMULATIVE
2016	1131	900	2,766	3,548	8,345	8,345
2017	1131	0	2,766	3,548	7,445	15,790
2018	1131	0	2,766	3,548	7,445	23,234
2019	1131	0	2,766	3,548	7,445	30,679
2020	1131	0	2,766	3,548	7,445	38,124
2021	1131	0	2,766	3,548	7,445	45,569
2022	1131	0	2,766	3,548	7,445	53,014
2023	1131	0	2,766	3,548	7,445	60,459
2024	1131	0	2,766	3,548	7,445	67,903
2025	1131	0	2,766	3,548	7,445	75,348
2026	105	0	244	308	657	76,005
2027	105	0	244	308	657	76,662
2028	105	0	244	308	657	77,319
2029	105	0	244	308	657	77,976
2030	105	0	244	308	657	78,633
2031	105	0	244	308	657	79,290
2032	105	0	244	308	657	79,947
2033	105	0	244	308	657	80,604
2034	105	0	244	308	657	81,261
2035	105	0	244	308	657	81,918
2036	105	0	244	308	657	82,575
2037	105	0	244	308	657	83,232
2038	105	0	244	308	657	83,889
2039	105	0	244	308	657	84,546
2040	105	0	244	308	657	85,203
2041	105	0	244	308	657	85,860
2042	105	0	244	308	657	86,517
2043	105	0	244	308	657	87,174
2044	105	0	244	308	657	87,831
2045	105	0	244	308	657	88,488
2046	105	0	244	308	657	89,145

D-3-2: NOx Emission for EPA FIP

Table D-3: Annual NOx Emission Calculations for EPA FIP

2016- 2017: LNB+SOFA

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.201 [1]	1494 [2]	86% [2]	1,131
Unit 2	0.299 [1]	3,022 [3]	91% [3]	3,601
Unit 3	0.211 [1]	3,480 [3]	86% [3]	2,766
Unit 4	0.198 [1]	4,399 [3]	93% [3]	3,548

[1] Average actual emission factors are from the installation of LNB and SOFA through the end of 2013.

[2] Heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.

[3] Heat input and annual capacity factors for Units 2, 3 and 4 are taken from EPA FIP FR 72548 Table 11, dated December 5, 2012.

2018-2046: SCR with LNB+SOFA for Units 2, 3, 4, LNB+SOFA for Unit 1

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.201 [1]	1,494 [3]	86% [3]	1,131
Unit 2	0.05 [2]	3,022 [2]	91% [2]	602
Unit 3	0.05 [2]	3,480 [2]	86% [2]	655
Unit 4	0.05 [2]	4,399 [2]	93% [2]	896

[1] Average actual emission factors are from the installation of LNB and SOFA through the end of 2013.

[2] Emission factors for Units 2, 3 and 4 are taken from EPA FIP FR 72515 Table 1; heat input and annual capacity factors for Units 2, 3 and 4 are from EPA FIP FR 72548 Table 11,dated December 5, 2012.

[3] Heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.

Annual NOx emissions for each year as well as cumulative emissions for EPA FIP case are presented in Table D-4.

Table D-4: Annual NOx Emissions for EPA FIP 2016 through 2046 (tons)

Year	Unit 1	Unit 2	Unit 3	Unit 4	SUM	CUMULATIVE
2016	1131	3,601	2,766	3,548	11,046	11,046
2017	1131	3,601	2,766	3,548	11,046	22,093
2018	1131	602	655	896	3,285	25,377
2019	1131	602	655	896	3,285	28,662
2020	1131	602	655	896	3,285	31,947
2021	1131	602	655	896	3,285	35,231
2022	1131	602	655	896	3,285	38,516
2023	1131	602	655	896	3,285	41,801
2024	1131	602	655	896	3,285	45,085
2025	1131	602	655	896	3,285	48,370
2026	1131	602	655	896	3,285	51,655
2027	1131	602	655	896	3,285	54,939
2028	1131	602	655	896	3,285	58,224
2029	1131	602	655	896	3,285	61,509
2030	1131	602	655	896	3,285	64,793
2031	1131	602	655	896	3,285	68,078
2032	1131	602	655	896	3,285	71,363
2033	1131	602	655	896	3,285	74,647
2034	1131	602	655	896	3,285	77,932
2035	1131	602	655	896	3,285	81,217
2036	1131	602	655	896	3,285	84,501
2037	1131	602	655	896	3,285	87,786
2038	1131	602	655	896	3,285	91,071
2039	1131	602	655	896	3,285	94,356
2040	1131	602	655	896	3,285	97,640
2041	1131	602	655	896	3,285	100,925
2042	1131	602	655	896	3,285	104,210
2043	1131	602	655	896	3,285	107,494
2044	1131	602	655	896	3,285	110,779
2045	1131	602	655	896	3,285	114,064
2046	1131	602	655	896	3,285	117,348

D-3 Annual SO_2 Emission Calculations

D-3-1 SO_2 Emissions Cholla BART Reassessment

Emission factors and annual capacity factors for the Cholla BART Reassessment are shown in Table D-5.

Table D-5: Annual SO_2 Emission Calculations for Cholla BART Reassessment

2016: Unit 2 Shutdown by April 1, 2016

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.150 [1]	1,494 [1]	86% [1]	844
Unit 2	0.150 [2]	3,022 [2]	91% [2]	452 [3]
Unit 3	0.150 [2]	3,480 [2]	86% [2]	1,966
Unit 4	0.150 [2]	4,399 [2]	93% [2]	2,688

[1] Emission factor, heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.
[2] Emission factors for Units 2, 3 and 4 are taken from EPA FIP FR 72515 Table 1; heat input and annual capacity factors for Units 2, 3 and 4, are from EPA FIP FR 72548 Table 11, dated December 5, 2012.
[3] SO_2 emission numbers for Unit 2 are based on the operation of this unit until April 1, 2016.

2017 – 2025: Unit 2 Shutdown, Units 1, 3 and 4 Coal Firing

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.150 [1]	1,494 [1]	86% [1]	844
Unit 2				0
Unit 3	0.150 [2]	3,480 [2]	86% [2]	1,966
Unit 4	0.150 [2]	4,399 [2]	93% [2]	2,688

[1] Emission factor, heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.
[2] Emission factors for Units 2, 3 and 4 are taken from EPA FIP FR 72515 Table 1; heat input and annual capacity factors for Units 2, 3 and 4, are from EPA FIP FR 72548 Table 11, dated December 5, 2012.

2026 – 2046: Unit 2 shutdown, Units 1, 3 and 4 Natural Gas Firing

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.0006 [1]	1,494 [2]	20% [1]	0.79
Unit 2				0
Unit 3	0.0006 [1]	3,480 [2]	20% [1]	1.83
Unit 4	0.0006 [1]	4,399 [2]	20% [1]	2.31

[1] Emission factor, heat input and annual capacity factor for Unit 1, and emission factors and capacity factors for Units 3 and 4 are based on the information in Cholla application.
[2] Heat inputs for Units 2, 3 and 4 are taken from EPA FIP FR 72548 Table 11, dated December 5, 2012.

Annual SO_2 emissions for each year as well as cumulative emissions for BART Reassessment are presented in Table D-6.

Table D-6: Cholla BART Reassessment Annual SO_2 Emissions for 2016 through 2046 (tons)

Year	Unit 1	Unit 2	Unit 3	Unit 4	SUM	CUMULATIVE
2016	844	452	1,966	2,688	5,950	5,950
2017	844	0	1,966	2,688	5,498	11,448
2018	844	0	1,966	2,688	5,498	16,946
2019	844	0	1,966	2,688	5,498	22,444
2020	844	0	1,966	2,688	5,498	27,942
2021	844	0	1,966	2,688	5,498	33,440
2022	844	0	1,966	2,688	5,498	38,938
2023	844	0	1,966	2,688	5,498	44,436
2024	844	0	1,966	2,688	5,498	49,934
2025	844	0	1,966	2,688	5,498	55,432
2026	1	0	2	2	5	55,437
2027	1	0	2	2	5	55,442
2028	1	0	2	2	5	55,447
2029	1	0	2	2	5	55,452
2030	1	0	2	2	5	55,457
2031	1	0	2	2	5	55,462
2032	1	0	2	2	5	55,467
2033	1	0	2	2	5	55,472
2034	1	0	2	2	5	55,477
2035	1	0	2	2	5	55,482
2036	1	0	2	2	5	55,487
2037	1	0	2	2	5	55,492
2038	1	0	2	2	5	55,497
2039	1	0	2	2	5	55,502
2040	1	0	2	2	5	55,507
2041	1	0	2	2	5	55,512
2042	1	0	2	2	5	55,517
2043	1	0	2	2	5	55,522
2044	1	0	2	2	5	55,527
2045	1	0	2	2	5	55,532
2046	1	0	2	2	5	55,537

D-3-2 SO_2 Emissions 2011 AZ SIP

Emission factors and annual capacity factors for the 2011 AZ SIP are shown in Table D-7.

Table D-7: Annual SO_2 Emission Calculations for 2011 AZ SIP

2016 – 2046: Units 1-4 Coal Firing

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.150 [1]	1,494 [1]	86% [1]	1,069
Unit 2	0.150 [2]	3,022 [2]	91% [2]	1,614
Unit 3	0.150 [2]	3,480 [2]	86% [2]	1,966
Unit 4	0.150 [2]	4,399 [2]	93% [2]	2,688

[1] Emission factor, heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.
[2] Emission factors for Units 2, 3 and 4 are taken from EPA FIP FR 72515 Table 1; heat input and annual capacity factors for Units 2, 3 and 4, are from EPA FIP FR 72548 Table 11, dated December 5, 2012.

Annual SO_2 emissions for each year as well as cumulative emissions are presented in Table D-8

Table D-8: Annual SO_2 Emissions for 2011 AZ SIP 2016 through 2046 (tons)

Year	Unit 1	Unit 2	Unit 3	Unit 4	SUM	CUMULATIVE
2016	844	1,807	1,966	2,688	7,305	7,305
2017	844	1,807	1,966	2,688	7,305	14,610
2018	844	1,807	1,966	2,688	7,305	21,915
2019	844	1,807	1,966	2,688	7,305	29,220
2020	844	1,807	1,966	2,688	7,305	36,525
2021	844	1,807	1,966	2,688	7,305	43,830
2022	844	1,807	1,966	2,688	7,305	51,135
2023	844	1,807	1,966	2,688	7,305	58,440
2024	844	1,807	1,966	2,688	7,305	65,745
2025	844	1,807	1,966	2,688	7,305	73,050
2026	844	1,807	1,966	2,688	7,305	80,355
2027	844	1,807	1,966	2,688	7,305	87,660
2028	844	1,807	1,966	2,688	7,305	94,965
2029	844	1,807	1,966	2,688	7,305	102,270
2030	844	1,807	1,966	2,688	7,305	109,575
2031	844	1,807	1,966	2,688	7,305	116,880
2032	844	1,807	1,966	2,688	7,305	124,185
2033	844	1,807	1,966	2,688	7,305	131,490
2034	844	1,807	1,966	2,688	7,305	138,795
2035	844	1,807	1,966	2,688	7,305	146,100
2036	844	1,807	1,966	2,688	7,305	153,405
2037	844	1,807	1,966	2,688	7,305	160,710
2038	844	1,807	1,966	2,688	7,305	168,015
2039	844	1,807	1,966	2,688	7,305	175,320
2040	844	1,807	1,966	2,688	7,305	182,625
2041	844	1,807	1,966	2,688	7,305	189,930
2042	844	1,807	1,966	2,688	7,305	197,235
2043	844	1,807	1,966	2,688	7,305	204,540
2044	844	1,807	1,966	2,688	7,305	211,845
2045	844	1,807	1,966	2,688	7,305	219,150
2046	844	1,807	1,966	2,688	7,305	226,455

D-4 Annual PM_{10} Emission Calculations

D-4-1 PM_{10} Emissions Cholla BART Reassessment

Emission factors and annual capacity factors for the Cholla BART Reassessment are shown in Table D-9.

2016: Unit 2 Shutdown by April 1, 2016

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.015 [1]	1,494 [1]	86% [1]	84.4
Unit 2	0.026 [3]	3,022 [2]	91% [2]	78.0
Unit 3	0.015 [2]	3,480 [2]	86% [2]	196.6
Unit 4	0.015 [2]	4,399 [2]	93% [2]	268.8

[1] Emission factor, heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.
[2] Emission factors for Units 2, 3 and 4 are taken from EPA FIP FR 72515 Table 1; heat input and annual capacity factors for Units 2, 3 and 4, are from EPA FIP FR 72548 Table 11,dated December 5, 2012.
[3] Emission factors for Unit 2 are from Cholla application.

2017 – 2025: Unit 2 shutdown

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.015 [1]	1,494 [1]	86% [1]	84.4
Unit 2				0
Unit 3	0.015 [2]	3,480 [2]	86% [2]	196.6
Unit 4	0.015 [2]	4,399 [2]	93% [2]	268.8

[1] Emission factor, heat input and annual capacity factor for Unit 1 are based on the information in Cholla application
[2] Emission factors for Units 2, 3 and 4 are taken from EPA FIP FR 72515 Table 1; heat input and annual capacity factors for Units 2, 3 and 4, are from EPA FIP FR 72548 Table 11, dated December 5, 2012.

2026 – 2046: Units 1, 3 and 4 on Natural Gas, Unit 2 Shutdown

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.01 [1]	1,494 [1]	20% [1]	13.1
Unit 2				0
Unit 3	0.01 [1]	3,480 [2]	20% [1]	30.5
Unit 4	0.01 [1]	4,399 [2]	20% [1]	38.5

[1] Emission factor, heat input and annual capacity factor for Unit 1, and emission factors and capacity factors for Units 3 and 4 are based on the information in Cholla application.
[2] Heat inputs for Units 2, 3 and 4 are taken from EPA FIP FR 72548 Table 11, dated December 5, 2012.

Annual PM_{10} emissions for each year as well as cumulative emissions are presented in Table D-10.

Table D-10: Cholla BART Reassessment Annual PM_{10} Emissions for 2016 through 2046 (tons)

Year	Unit 1	Unit 2	Unit 3	Unit 4	SUM	CUMULATIVE
2016	84	78	197	269	628	628
2017	84	0	197	269	550	1,178
2018	84	0	197	269	550	1,728
2019	84	0	197	269	550	2,278
2020	84	0	197	269	550	2,828
2021	84	0	197	269	550	3,378
2022	84	0	197	269	550	3,928
2023	84	0	197	269	550	4,478
2024	84	0	197	269	550	5,028
2025	84	0	197	269	550	5,578
2026	13	0	30	39	82	5,660
2027	13	0	30	39	82	5,742
2028	13	0	30	39	82	5,824
2029	13	0	30	39	82	5,906
2030	13	0	30	39	82	5,988
2031	13	0	30	39	82	6,070
2032	13	0	30	39	82	6,152
2033	13	0	30	39	82	6,234
2034	13	0	30	39	82	6,316
2035	13	0	30	39	82	6,398
2036	13	0	30	39	82	6,480
2037	13	0	30	39	82	6,562
2038	13	0	30	39	82	6,644
2039	13	0	30	39	82	6,726
2040	13	0	30	39	82	6,808
2041	13	0	30	39	82	6,890
2042	13	0	30	39	82	6,972
2043	13	0	30	39	82	7,054
2044	13	0	30	39	82	7,136
2045	13	0	30	39	82	7,218
2046	13	0	30	39	82	7,300

D-4-2 PM_{10} Emissions 2011 AZ SIP

Emission factors and annual capacity factors for the 2011 AZ SIP are shown in Table D-11.

Table D-11: Annual PM_{10} Emission Calculations for2011 AZ SIP

2016: Coal Firing

Unit Number	Emission Factor)	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.015[1]	1,494[1]	86%[1]	84
Unit 2	0.026[2]/0.015[3]	3,022[3]	91%[3]	214
Unit 3	0.015[3]	3,480[3]	86%[3]	197
Unit 4	0.015[3]	4,399[3]	93%[3]	269

[1] Emission factor, heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.

[2] Per Cholla application, 0.026 lb/MMBtu is used for Unit 2 prior to April 1, 2016.

[3]Emission factors for Units 2, 3 and 4 are taken from EPA FIP FR 72515 Table 1; heat input and annual capacity factors for Units 2, 3 and 4 are from EPA FIP FR 72548 Table 11, dated December 5, 2012.

2017 – 2046: Coal Firing

Unit Number	Emission Factor	Heat Input	Annual Capacity Factor	Annual Emissions
	lb/MMBtu	MMBtu/hr	%	tons
Unit 1	0.015 [1]	1,494 [1]	86% [1]	84
Unit 2	0.015 [2]	3,022 [2]	91% [2]	181
Unit 3	0.015 [2]	3,480 [2]	86% [2]	197
Unit 4	0.015 [2]	4,399 [2]	93% [2]	269

[1] Emission factor, heat input and annual capacity factor for Unit 1 are based on the information in Cholla application.

[2] Emission factors for Units 2, 3 and 4 are taken from EPA FIP FR 72515 Table 1; heat input and annual capacity factors for Units 2, 3 and 4 are from EPA FIP FR 72548 Table 11,dated December 5, 2012.

Annual PM_{10} emissions for each year as well as cumulative emissions are presented in Table D-12.

Table D-12: Annual PM_{10} Emissions for 2011 AZ SIP 2016 through 2046

Year	Unit 1	Unit 2	Unit 3	Unit 4	SUM	CUMULATIVE
2016	84	214	197	269	764	764
2017	84	181	197	269	731	1,495
2018	84	181	197	269	731	2,226
2019	84	181	197	269	731	2,957
2020	84	181	197	269	731	3,688
2021	84	181	197	269	731	4,419
2022	84	181	197	269	731	5,150
2023	84	181	197	269	731	5,881
2024	84	181	197	269	731	6,612
2025	84	181	197	269	731	7,343
2026	84	181	197	269	731	8,074
2027	84	181	197	269	731	8,805
2028	84	181	197	269	731	9,536
2029	84	181	197	269	731	10,267
2030	84	181	197	269	731	10,998
2031	84	181	197	269	731	11,729
2032	84	181	197	269	731	12,460
2033	84	181	197	269	731	13,191
2034	84	181	197	269	731	13,922
2035	84	181	197	269	731	14,653
2036	84	181	197	269	731	15,384
2037	84	181	197	269	731	16,115
2038	84	181	197	269	731	16,846
2039	84	181	197	269	731	17,577
2040	84	181	197	269	731	18,308
2041	84	181	197	269	731	19,039
2042	84	181	197	269	731	19,770
2043	84	181	197	269	731	20,501
2044	84	181	197	269	731	21,232
2045	84	181	197	269	731	21,963
2046	84	181	197	269	731	22,694

D-5 Emission Comparison – Cholla BART Reassessment vs. Applicable 2011 AZ SIP / EPA FIP

Table D-13 provides cumulative emissions for the Cholla BART Reassessment vs. the applicable 2011 AZ SIP/EPA FIP.

Table D-13: Annual and Cumulative NOx, SO_2 and PM_{10} Emissions (tons)

Year	BART Reassessment Cumulative NOx	EPA FIP Cumulative NOx	BART Reassessment Cumulative SO_2	2011 AZ SIP Cumulative SO_2	BART Reassessment Cumulative PM_{10}	2011 AZ SIP Cumulative PM_{10}
2016	8,345	11,046	5,950	7,305	628	764
2017	15,790	22,093	11,448	14,610	1,178	1,495
2018	23,234	25,377	16,946	21,915	1,728	2,226
2019	30,679	28,662	22,444	29,220	2,278	2,957
2020	38,124	31,947	27,942	36,525	2,828	3,688
2021	45,569	35,231	33,440	43,830	3,378	4,419
2022	53,014	38,516	38,938	51,135	3,928	5,150
2023	60,459	41,801	44,436	58,440	4,478	5,881
2024	67,903	45,085	49,934	65,745	5,028	6,612
2025	75,348	48,370	55,432	73,050	5,578	7,343
2026	76,005	51,655	55,437	80,355	5,660	8,074
2027	76,662	54,939	55,442	87,660	5,742	8,805
2028	77,319	58,224	55,447	94,965	5,824	9,536
2029	77,976	61,509	55,452	102,270	5,906	10,267
2030	78,633	64,793	55,457	109,575	5,988	10,998
2031	79,290	68,078	55,462	116,880	6,070	11,729
2032	79,947	71,363	55,467	124,185	6,152	12,460
2033	80,604	74,647	55,472	131,490	6,234	13,191
2034	81,261	77,932	55,477	138,795	6,316	13,922
2035	81,918	81,217	55,482	146,100	6,398	14,653
2036	82,575	84,501	55,487	153,405	6,480	15,384
2037	83,232	87,786	55,492	160,710	6,562	16,115
2038	83,889	91,071	55,497	168,015	6,644	16,846
2039	84,546	94,356	55,502	175,320	6,726	17,577
2040	85,203	97,640	55,507	182,625	6,808	18,308
2041	85,860	100,925	55,512	189,930	6,890	19,039
2042	86,517	104,210	55,517	197,235	6,972	19,770
2043	87,174	107,494	55,522	204,540	7,054	20,501
2044	87,831	110,779	55,527	211,845	7,136	21,232
2045	88,488	114,064	55,532	219,150	7,218	21,963
2046	89,145	117,348	55,537	226,455	7,300	22,694

Appendix E

Supplemental Visibility Analysis for Long-Term Benefits of the Proposed BART Reassessment

E-1 Overview of Approach

The visibility impact analysis presented in the Cholla BART Reassessment Section 2.2.5 focuses on the "2018 milestone year." However, to support the CAA Section 110(l) analysis, APS and PacifiCorp have conducted additional modeling to compare long-term visibility impact benefits of the Cholla BART Reassessment with those of the EPA FIP for the period of 2016 to 2046. Year 2016 was selected as the starting year for comparison purposes because, prior to 2016, there is no difference in visibility impacts between the Cholla BART Reassessment and the FIP. Further, to simplify the visibility analysis, the modeling neglected the difference between the EPA FIP and the Cholla BART Reassessment during 2016-2017 and focused the comparison for the period of 2018 to 2046. In fact, the Cholla BART Reassessment will achieve greater visibility improvement than the EPA FIP during 2016-2017, since the EPA FIP imposes additional controls at Unit 2 while Cholla BART Reassessment proposes to permanently shut down Unit 2.

This document provides a comparison of integrated visibility impact benefits of the Cholla BART Reassessment to the EPA FIP for the 2018 to 2046 period. Detailed modeling Scenarios for long-term visibility improvement from Cholla BART Reassessment vs. EPA FIP are shown in Table E-1.

Table E-1: Modeling Scenarios for Long-term Visibility Improvement from EPA FIP vs. Cholla BART Reassessment

	Time Period	Modeling Scenarios
EPA FIP	2018-2046	SCR with LNB/SOFA controls for Units 2, 3, and 4 and LNB/SOFA controls for Unit 1; FGD systems for Units 2, 3 and 4; New baghouses for Units 2, 3, and 4.
Cholla BART Reassessment	2018-2025	LNB/SOFA controls for Units 1, 3, and 4; FGD systems for Units 3 and 4; New baghouses for Units 3 and 4; Unit 2 is shutdown.
	2026-2046	Units 1, 3, and 4 are operated on natural gas with a 20 percent annual average capacity factor; Unit 2 is shutdown.

E-2 CALPUFF Modeling Input Data

The supplemental visibility assessment to compute the haze impact was conducted with the CALPUFF model version 5.8 in the manner approved and used by EPA in its FIP. The CALPUFF modeling involved meteorological data for the years 2001-2003, an assumption of 1.0 part per billion background ammonia concentration, and "Method 8b" 20 percent best days background conditions for all cases.

The visibility impacts were predicted at the thirteen Class I areas within 300 km of Cholla. Table E-2 lists the exhaust parameters. Tables E-3, E-4 and E-5 list input emissions data for different modeling scenarios.

Table E-2: Modeled Stack Exhaust Parameters

Unit	Fuel	GEP Creditable Stack Height (m)	Stack Elevation (m)	Stack Diameter (m)	Stack Temperature (K)	Exit Velocity (m/s)
Unit 1	Coal	76.20	1533	3.43	322.0	20.73
Unit 2&3 Merged	Coal	144.81	1530	6.88	396.0	29.60
Unit 3	Coal	144.81	1530	5.23	322.0	22.25
Unit 4	Coal	167.64	1530	5.85	324.0	23.50
Unit 1	Natural Gas	76.20	1533	3.43	405.4	19.66
Unit 2	Natural Gas	144.81	1530	4.47	405.4	25.91
Unit 3	Natural Gas	144.81	1530	5.23	405.4	19.78
Unit 4	Natural Gas	167.64	1530	5.85	405.4	22.19

Table E-3: Modeling Emissions for the 2018 to 2025 Period: SO_2 Controls, PM_{10} Emission Reductions, LNB & SOFA on Units 1, 3, and 4, Unit 2 Shut Down (BART Reassessment Modeling Case)

Unit	Fuel	NOx Controls	NOx Max Daily	Max. Daily Heat Input for SO2 and PM	SO2 Emission Factor	SO2 Max Daily	PM10 filt Emission Factor	PM10 filt Max Daily	NOx	SO2	PM	PMC	PMF	EC	SO4	SOA
			lb/hr	MMBtu/hr	lb/MMBtu	lb/hr	lb/MMBtu	lb/hr	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
Unit 1 [a]	Coal	LNB & SOFA	371[b]	1,494[a]	0.150	224.1	0.015	22.41	46.68	28.24	2.82	0.81[e]	1.94[e]	0.07[e]	0.32[e]	0.08[e]
Unit 2	Shutdown		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unit 3	Coal	LNB & SOFA	799[b]	3,480[c]	0.150[d]	522.0	0.015[d]	52.20	100.61	65.77	6.58	3.29 [f]	3.17[f]	0.12[f]	5.55[f]	1.39[f]
Unit 4	Coal	LNB & SOFA	1,101[b]	4,399[c]	0.150[d]	659.9	0.015[d]	65.99	138.70	83.14	8.31	4.16 [f]	4.00[f]	0.15[f]	7.01[f]	1.75[f]

(a) Unit 1 is not BART eligible. Assumed LNB+SOFA based on further reasonable progress. Heat input is based on EPA's max daily heat input rate over 2008-2010 period for Unit 1. Table 2-A(a) "Technical Analysis for Arizona and Hawaii Regional Haze FIPs: Task 8: Five-Factor BART Analysis for AEPCO Apache, APS Cholla and SRP Coronado". July 16, 2012.
(b) See Table C-2 to C-5 in Appendix C.
(c) Heat rate is consistent with EPA BART rule (Table 11, 77 FR 72548).
(d) EPA BART rule (Table 1, 77 FR 72515).
(e) PM speciation based on the National Park Service spreadsheet for coal-fired boilers with a wet scrubber http://www.nature.nps.gov/air/permits/ect/docs/coalBoiler/2006FinalDryBottomPCScrubberPmSpeciationProfile.xls
(f) PM speciation based on the National Park Service spreadsheet for coal-fired boilers with FGD+FF http://www.nature.nps.gov/air/permits/ect/docs/coalBoiler/2006FinalDryBottomPC_FGD_FFpmSpeciationProfile.xls

Table E-4: Modeling Emissions for the 2018 to 2046 Period: LNB & SOFA on Unit 1, Baghouses, FGD, LNB & SOFA, and SCR on Units 2, 3, and 4 (EPA FIP Modeling Case)

Unit	Fuel	NOx Controls	NOx Max Daily	Max. Daily Heat Input for SO2 and PM	SO2 Emission Factor	SO2 Max Daily	PM10 filt Emission Factor	PM10 filt Max Daily	NOx	SO2	PM	PMC	PMF	EC	SO4	SOA
			lb/hr	lb/hr	lb/hr	lb/hr	lb/MMBtu	lb/hr	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
Unit 1[a]	Coal	LNB & SOFA	371[b]	1,494[a]	0.150[d]	224.1	0.015	22.41	46.68	28.24	2.82	0.81	1.94	0.07	0.32	0.08
Unit 2	Coal	LNB & SOFA and SCR	243[b]	3,022[c]	0.150[d]	453.3	0.015[d]	45.33	30.64	57.12	5.71	2.86[e]	2.75[e]	0.11[e]	4.82[e]	1.20[e]
Unit 3	Coal	LNB & SOFA and SCR	189[b]	3,480[c]	0.150[d]	522.0	0.015[d]	52.20	23.84	65.77	6.58	3.29[e]	3.17[e]	0.12[e]	5.55[e]	1.39[e]
Unit 4	Coal	LNB & SOFA and SCR	275[b]	4,399[c]	0.150[d]	659.9	0.015[d]	65.99	34.67	83.14	8.31	4.16[e]	4.00[e]	0.15[e]	7.01[e]	1.75[e]

(a) Unit 1 is not BART eligible. Assumed LNB+SOFA based on further reasonable progress. Heat input is based on EPA's max daily heat input rate over 2008-2010 period for Unit1. Table 2-A(a) "Technical Analysis for Arizona and Hawaii Regional Haze FIPs: Task 8: Five-Factor BART Analysis for AEPCO Apache, APS Cholla and SRP Coronado". July 16, 2012.
(b) See Table C-2 to C-5 in Appendix C
(c) Heat rate is consistent with EPA BART rule (Table 11, 77 FR 72548).
(d) EPA BART rule (Table 1, 77 FR 72515).
(e) PM speciation based on the National Park Service spreadsheet for coal-fired boilers with FGD+FF http://www.nature.nps.gov/air/permits/ect/docs/coalBoiler/2006FinalDryBottomPC_FGD_FFpmSpeciationProfile.xls

Table E-5: Modeling Emissions for the 2026 to 2046 Period: LNB & SOFA on Units 1, 3, and 4, Unit 2 Shut Down, Natural Gas (BART Reassessment Modeling Case)

Unit	Fuel	NOx Controls	Heat Input	NOx Emission	SO2 Emission	PM10 total	NOx	SO2	PM10	NOx	SO2	PM	PMC	PMF	EC	SO4	SOA
			MMBtu/hr	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/hr	lb/hr	lb/hr	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
Unit 1	NG	NG	1411 [a]	0.080 [c]	0.0006 [c]	0.010 [c]	135.4 [e]	0.85	14.11	17.07	0.11	1.78	0.00 [d]	0.00 [d]	0.44 [d]	0.05 [d]	1.28 [d]
Unit 2	Shutdown		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unit 3	NG	NG	3480 [b]	0.080 [c]	0.0006 [c]	0.010 [c]	302.75	2.09	34.80	38.15	0.26	4.38	0.00 [d]	0.00 [d]	1.10 [d]	0.13 [d]	3.16 [d]
Unit 4	NG	NG	4399 [b]	0.080 [c]	0.0006 [c]	0.010 [c]	440.30	2.64	43.99	55.48	0.33	5.54	0.00 [d]	0.00 [d]	1.39 [d]	0.17 [d]	3.99 [d]

(a) Maximum daily heat input in the 2001 to 2003
(b) Heat rate is consistent with EPA BART rule (Table 11, 77 FR 72515).
(c) NOx and SO2 are based on future expected 30 boiler operating day permit limits. PM is based on expected short term permit limit (stack test)
(d) PM speciation based on the National Park Service spreadsheet for natural gas-fired boilers http://www.nature.nps.gov/air/permits/ect/docs/gasCT/EdRevConsensusGasCTexample.xls
(e) Unit 1 NOx is based on 1) the maximum daily heat input, 2) the expected 30 boiler operating day permit limit, and 3) a 20% margin to estimate the maximum daily lb/MMbtu emission limit.

E-3 CALPUFF Modeling Results

Table E-6 summarizes the 2001-2003 3-year average modeling results for all modeled cases and Class I areas. The results from Table E-6 were used to construct a timeline of cumulative visibility impacts in delta-deciviews for the period of 2018-2046.

The modeled FIP cumulative visibility impact (shown by the red solid line) is compared against the cumulative visibility impact associated with the BART Reassessment proposed controls (shown as blue dashed line), and presented in a the time-integrated graphical form in Figure E-1 for Petrified Forest National Park. The results for the other twelve Class I areas are plotted in Figures E-2 through E-13.

As shown in Figures E-1, the EPA FIP (the red curve) has lower integrated visibility impacts than the Cholla BART Reassessment (the blue curve) at the initial time period. The two curves then intersect at a certain point after the natural gas conversion in 2025. After that, the Cholla BART Reassessment shows greater integrated visibility improvements through 2046. Overall, the long-term visibility benefits are greater with the Cholla BART Reassessment than the EPA FIP. The general pattern of the integrated visibility results for the other twelve Class I areas is similar to that for Petrified Forest National Park (see Figures E-2 through E-13).

Table E-6: Predicted Visibility Impacts at Class I Areas Associated with EPA FIP vs. Cholla BART Reassessment

Class I Areas	EPA FIP	Cholla BART Reassessment	
	2018-2046	2018-2025	2026-2046
Petrified Forest NP	2.64	3.75	1.45
Grand Canyon NP	1.11	1.48	0.45
Capitol Reef NP	0.62	0.92	0.29
Mazatzal W A	0.75	0.83	0.30
Sycamore Canyon WA	0.73	0.94	0.29
Mount Baldy WA	0.69	0.87	0.28
Gila WA	0.46	0.47	0.17
Sierra Ancha WA	0.82	0.94	0.36
Mesa Verde NP	0.63	0.84	0.30
Galiuro WA	0.29	0.30	0.09
Superstition WA	0.73	0.88	0.30
Saguaro NP	0.20	0.19	0.05
Pine Mountain WA	0.51	0.58	0.17
Cumulative impacts over thirteen Class I Areas	10.18	12.99	4.50

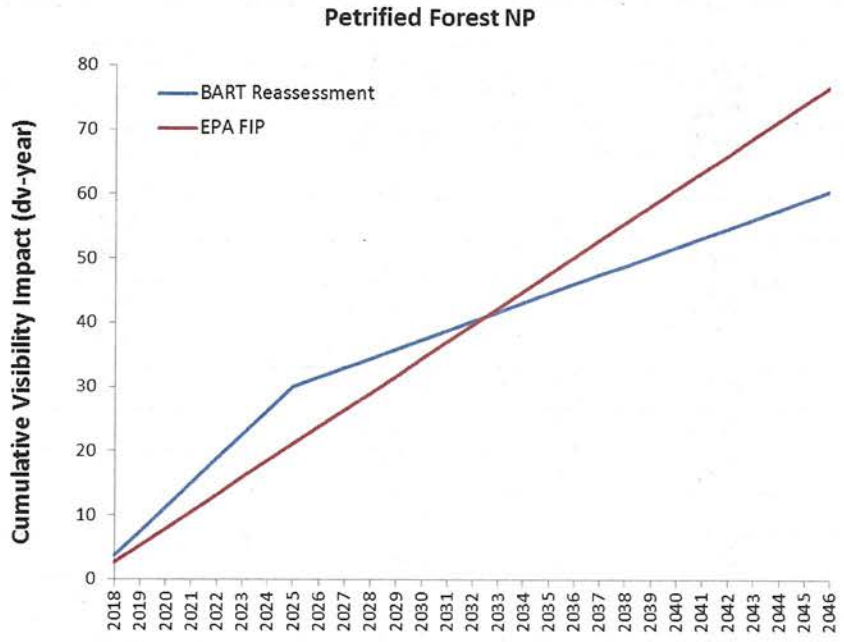

Figure E-1: Plot of Predicted Cumulative Visibility Impacts at Petrified Forest National Park Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

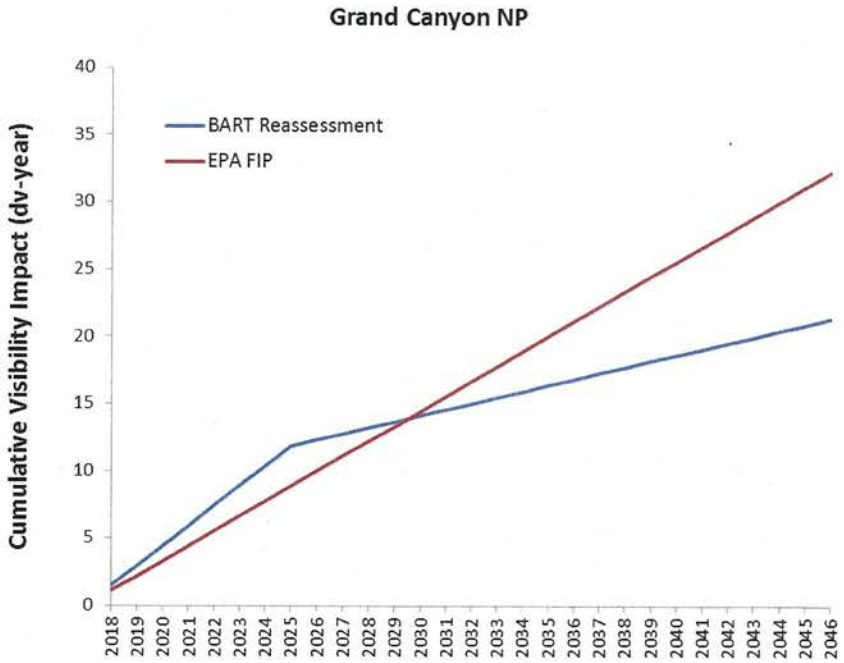

Figure E-2: Plot of Predicted Cumulative Visibility Impacts at Grand Canyon National Park Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

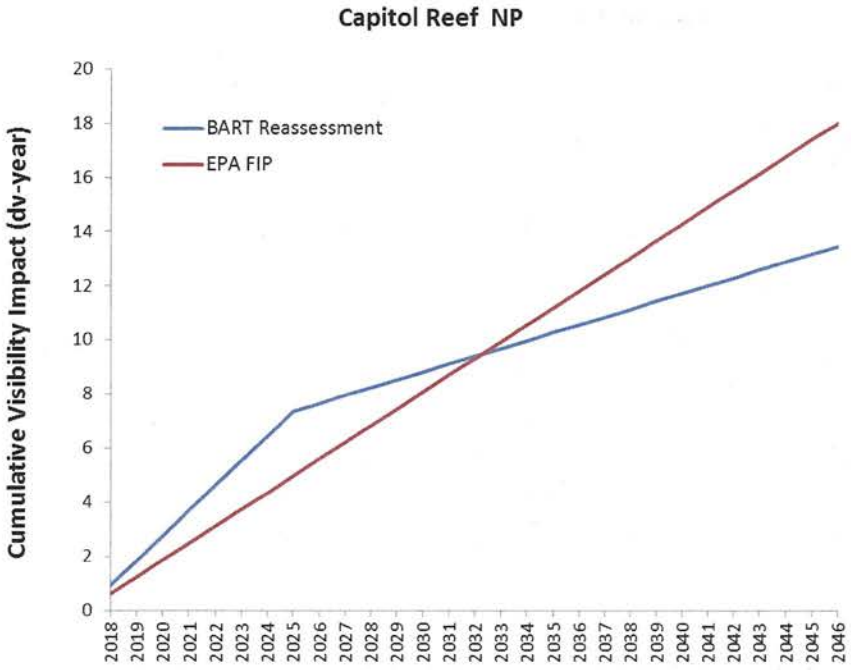

Figure E-3: Plot of Predicted Cumulative Visibility Impacts at Capitol Reef National Park Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

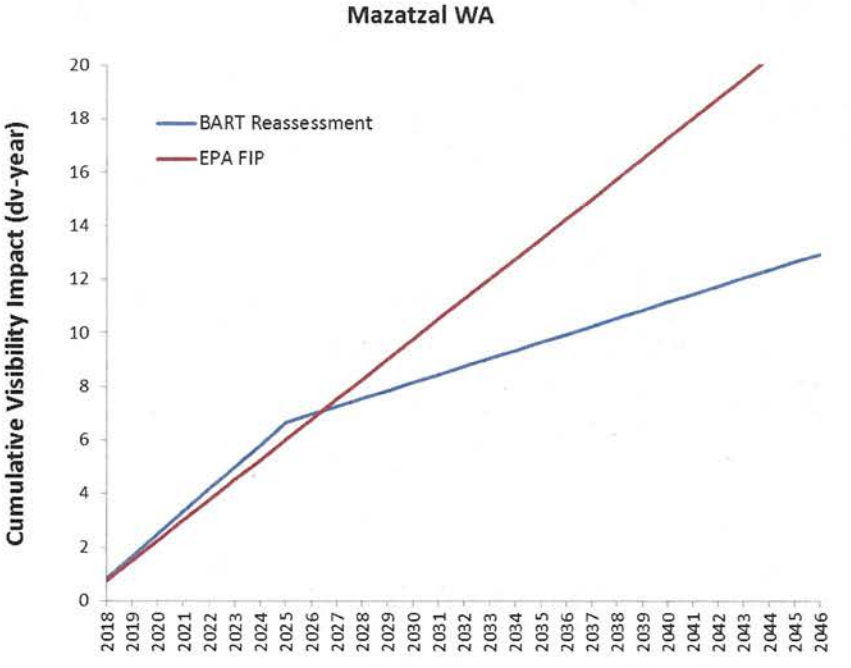

Figure E-4: Plot of Predicted Cumulative Visibility Impacts at Mazatzal Wilderness Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

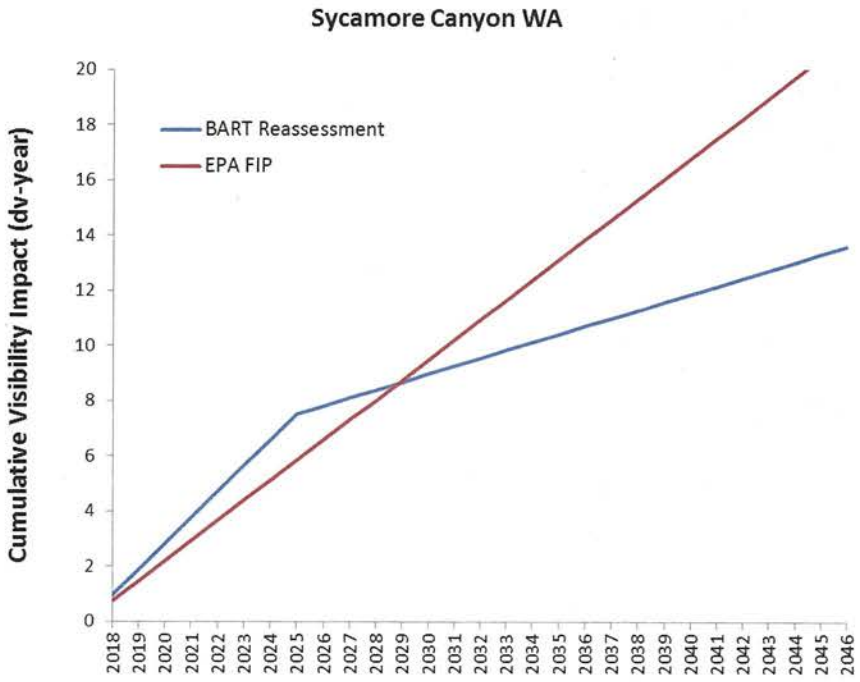

Figure E-5: Plot of Predicted Cumulative Visibility Impacts at Sycamore Canyon Wilderness Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

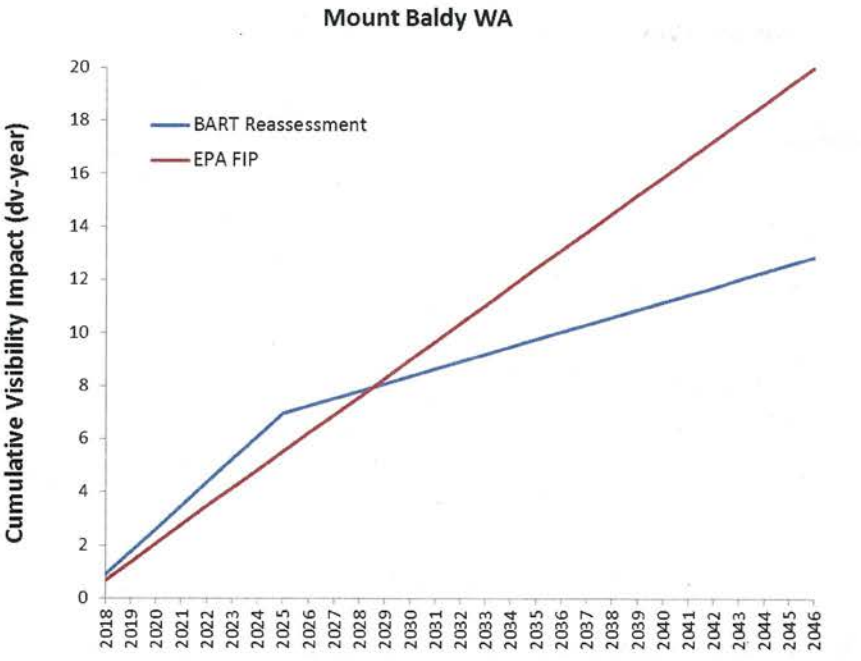

Figure E-6: Plot of Predicted Cumulative Visibility Impacts at Mount Baldy Wilderness Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

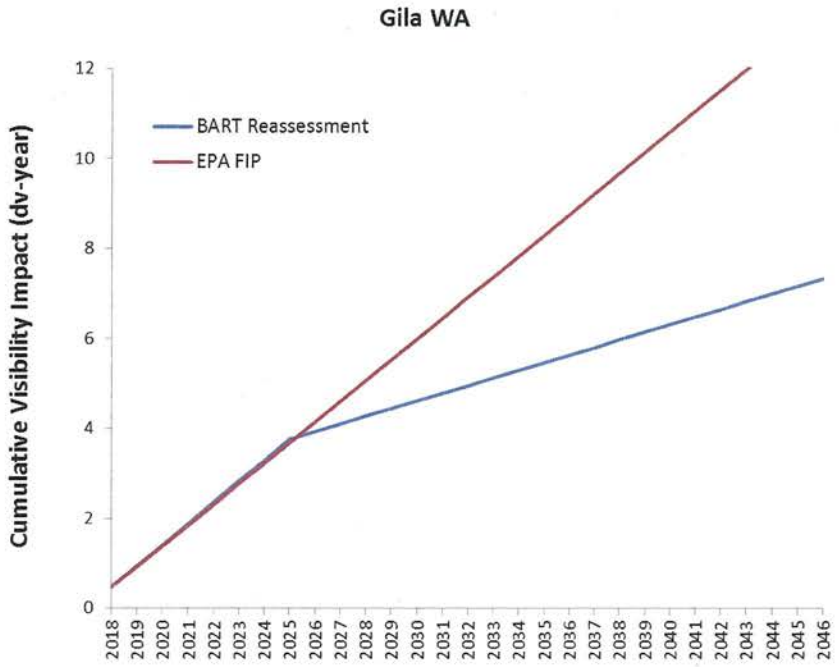

Figure E-7: Plot of Predicted Cumulative Visibility Impacts at Gila Wilderness Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

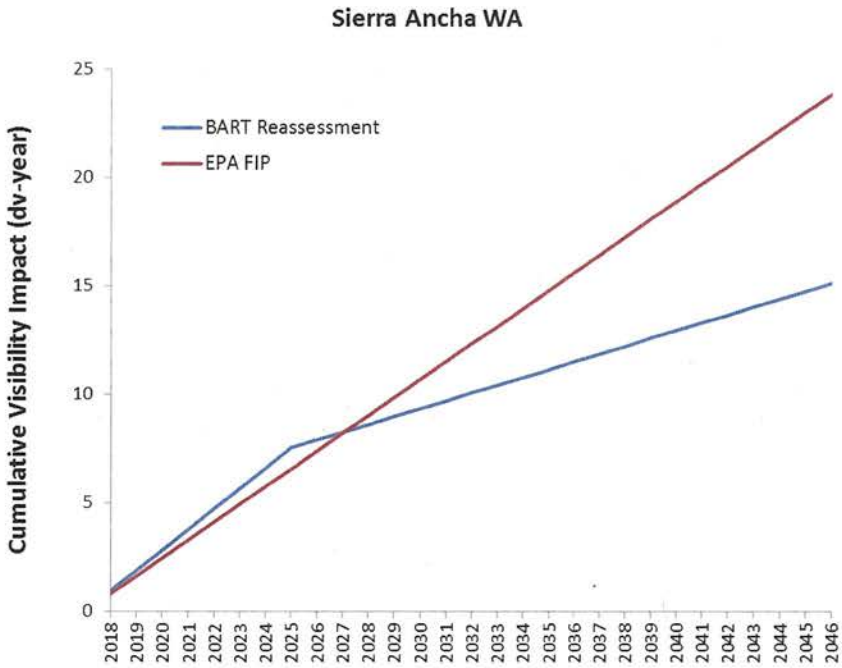

Figure E-8: Plot of Predicted Cumulative Visibility Impacts at Sierra Ancha Wilderness Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

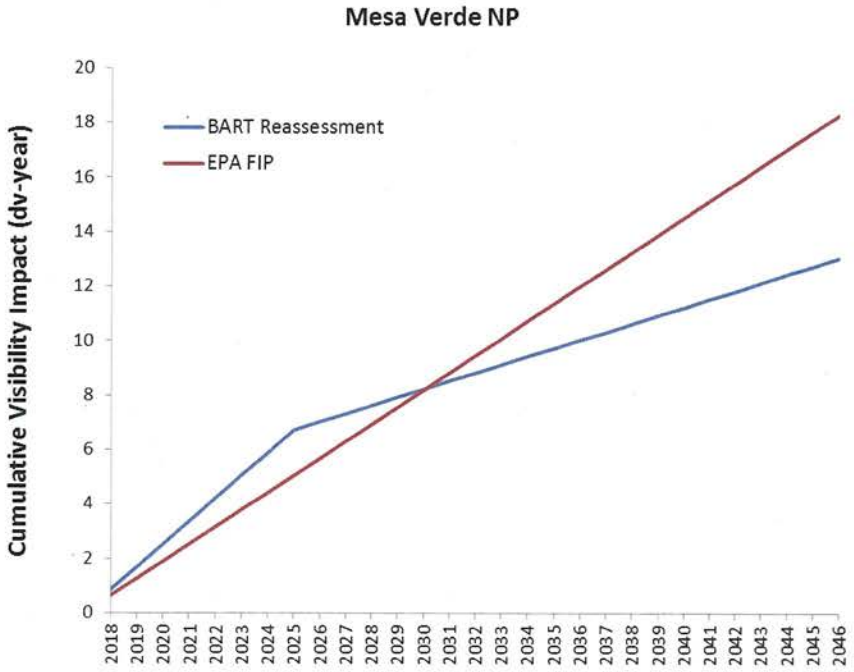

Figure E-9: Plot of Predicted Cumulative Visibility Impacts at Mesa Verde National Park Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

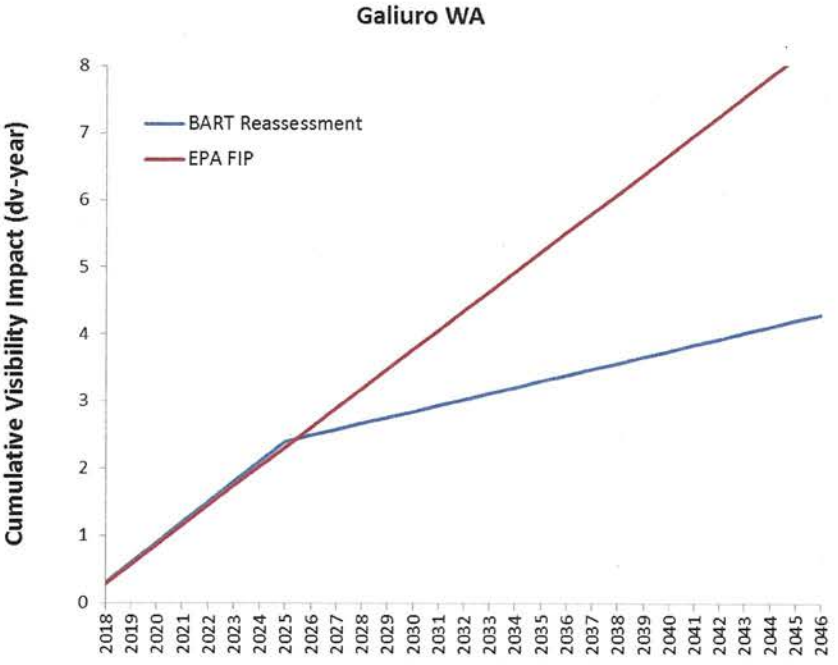

Figure E-10: Plot of Predicted Cumulative Visibility Impacts at Galiuro Wilderness Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

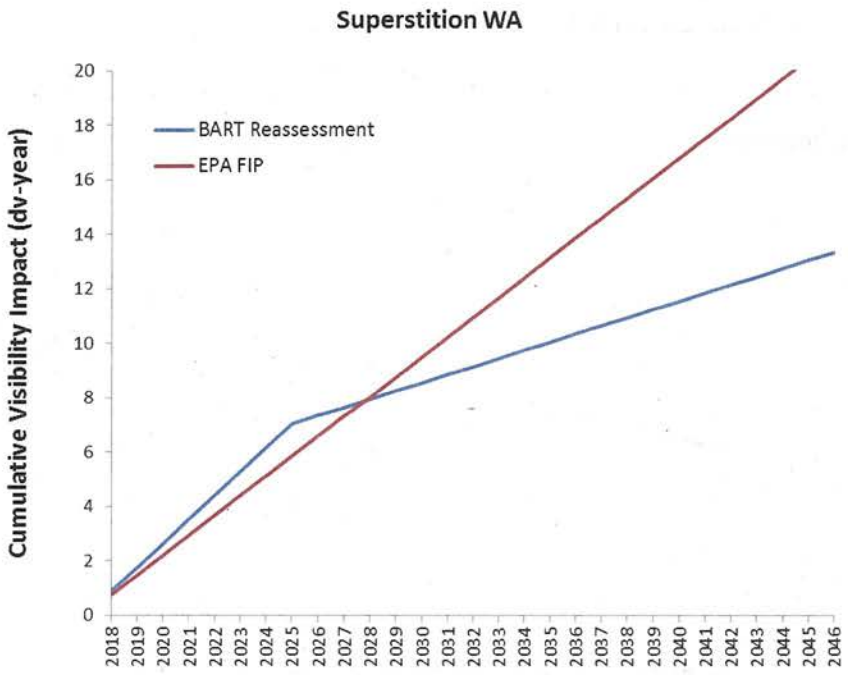

Figure E-11: Plot of Predicted Cumulative Visibility Impacts at Superstition Wilderness Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

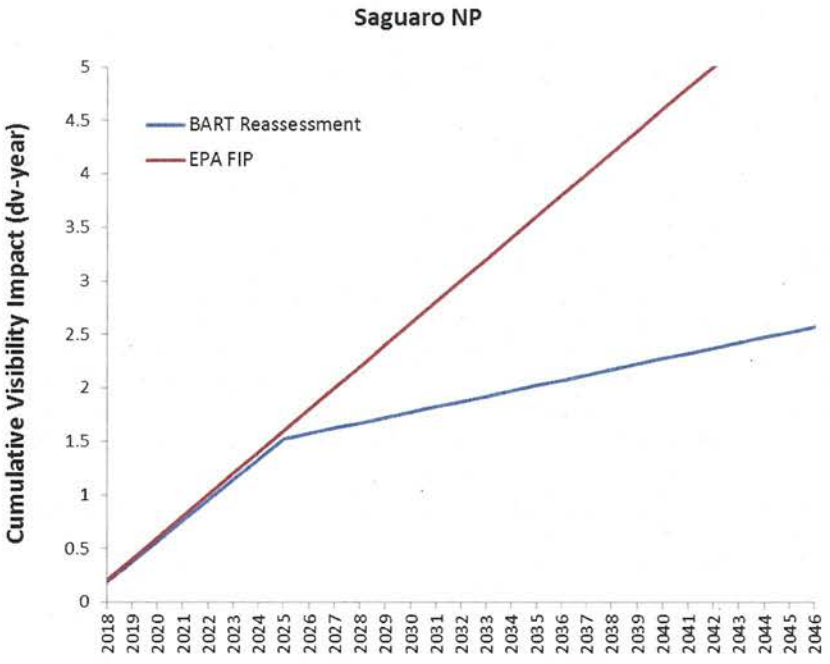

Figure E-12: Plot of Predicted Cumulative Visibility Impacts at Saguaro National Park Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

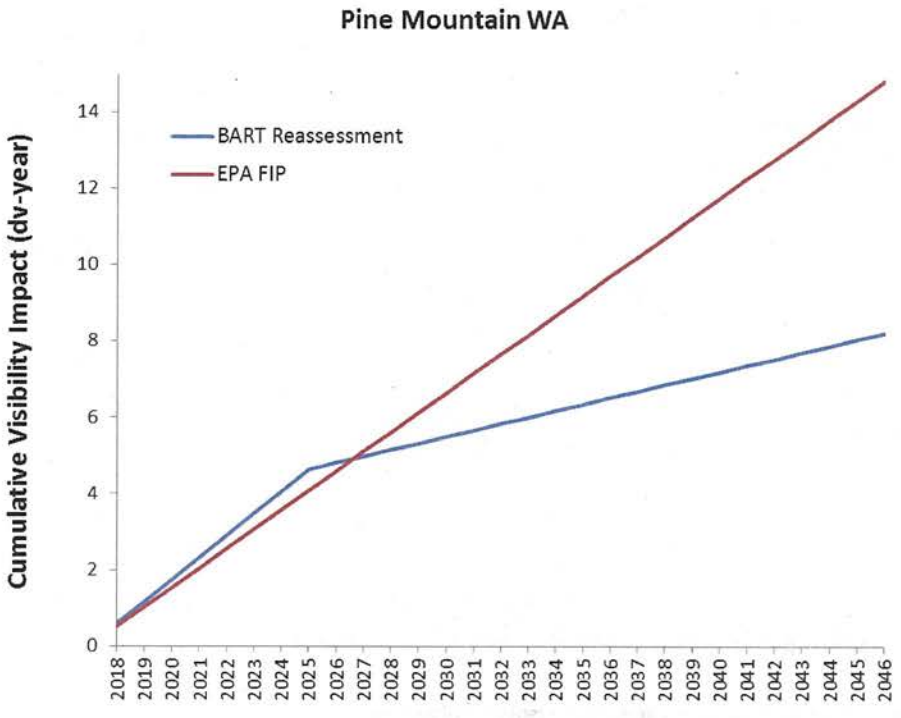

Figure E-13: Plot of Predicted Cumulative Visibility Impacts at Pine Mountain Wilderness Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

Appendix F
State Implementation Plan Revision Public Comment and Hearing Documentation

Appendix F.1

Notice of Public Hearing

ADEQ Arizona Department of Environmental Quality

PUBLIC NOTICE

PUBLIC NOTICE

YOU HAVE A VOICE IN AIR POLLUTION CONTROL IN ARIZONA

The Arizona Department of Environmental Quality (ADEQ) proposes two actions through this public notice; a revision to the Arizona State Regional Haze State Implementation Plan (SIP) and Significant Permit Revision No. 61713 to Air Quality Control Permit No. 53399 for Arizona Public Service Company (APS) for the Cholla Generating Station located at 4801 Frontage Road, Joseph City, Navajo County, Arizona 86032. The mailing address for the facility is P. O. Box 188, Joseph City, Navajo County, Arizona 86032. The significant revision to the permit is intended as a component of the SIP revision to assist in satisfying the Arizona Regional Haze Best Available Retrofit Technology (BART) requirements. The SIP and permit revisions will become effective following EPA's approval and final action rescinding the current Federal Implementation Plan. The permit revision requires APS to shut down coal-fired Unit 2 boiler by April 1, 2016. Additionally, the Permittee will be required to discontinue burning coal in Units 1, 3 and 4 by April 30, 2025. Thereafter, the Permittee may convert any or all of Units 1, 3, and 4 to pipeline-quality natural gas operation with a capacity factor not to exceed 20 percent. This revision also revises the emission limits for nitrogen oxides (NO_X) for all units operating on coal, and sets emission limits for Units 1, 3, and 4 for pipeline-quality natural gas operation, if the Permittee chooses to convert any of these units to natural gas operation. The facility is subject to the requirements of the Federal Clean Air Act, Code of Federal Regulations, Arizona Revised Statute 49-426, and the Arizona Administrative Code, Title 18, Chapter 2.

You have an opportunity to submit written comments and/or make oral comments on the permit and SIP revisions at the public hearings. ADEQ will be holding two public hearings regarding this matter. The first hearing will be on July 13, 2015 at 6:00 p.m. at the Public Works Complex, 100 West Public Works Drive, Holbrook, AZ 86025. The second hearing will be on July 14, 2015 at 1:30 p.m. at ADEQ, Conference Room 3175 A-B located at 1110 West Washington Street, Phoenix, AZ 85007. The hearings are designed to solicit comments on the proposed permit and SIP revision. ADEQ representatives, however, will be available prior to, and after the public hearing for informal discussions about the permit and SIP revisions.

The draft permit revision documents, draft SIP revision document and the APS Cholla permit revision application including the BART Reassessment proposal are available for review Monday through Friday between 8:30 a.m. and 4:30 p.m., at the ADEQ Records Center, at 1110 West Washington Street, Phoenix, Arizona. Please call (602) 771-4380 or email recordscenter@azdeq.gov 48 hours in advance to schedule an appointment to review the file. The documents are also available at Navajo County Clerk's Office at 100 East Code Talkers Drive, in Holbrook, AZ 86025 and at the Joseph City Post Office, 4592 W. Main Street, Joseph City, AZ 86032. The draft permit revision, technical support document and SIP revision documents may be viewed online at http://azdeq.gov/cgi-bin/vertical.pl by accessing the notice on the Events and Notices Calendar for the date of this public notice.

The public notice period is in effect from June 10, 2015 to July 14, 2015. Comments may be submitted in writing to: Balaji Vaidyanathan, Air Quality Permits Section Manager, ADEQ, 1110 West Washington Street, 3415A-1, Phoenix, AZ 85007 or via e-mail at bv1@azdeq.gov. Persons wishing to submit written comments can also do so at the public hearing. Comments must be received by July 14, 2015. The written comment shall state the name and mailing address of the person, shall be signed by the person,

their agent or attorney, and shall clearly set forth reasons why the permit revision should or should not be issued or why the SIP revision should not be finalized. Grounds for comment are limited to whether the permit revision and SIP revision meet the criteria for issuance spelled out in the state air pollution control laws or rules.

ADEQ will make a final decision on the proposed permit and SIP revision following consideration of all comments received during the public notice period. Everyone commenting will receive notification of the final decision along with a responsiveness summary. People who file comments on the permit will have the right to appeal the final decision as an appealable agency action to the Office of Administrative Hearing (OAH) pursuant to §41.1092.03, and the appeal must be filed within thirty (30) days after the issuance of the final decision. The OAH may sustain, modify, or reverse the final decision.

For questions or more information, or if you would like to receive copies of future public notices of air pollution control permits, please provide your name, address, and ZIP code, or e-mail address to Balaji Vaidyanathan, (602) 771-4527, toll free (800) 234-5677, via e-mail bv1@azdeq.gov or in writing to the ADEQ address above. In order to receive future public notices of air pollution control permits, your request should state that you wish your name to be placed on the air quality permit mailing list.

To request an auxiliary aid or service for accessible communication, please contact Alicia Pollard at (602) 771-4791 or at aap@azdeq.gov or dial 7-1-1 for TTY/TTD Services.

ADEQ
AIR QUALITY DIVISION
15 JUN 22 AM 11:28

Affidavit of Publication

State of Arizona)
)ss.
County of Navajo,)

I, Linda Kor, being duly sworn, depose and say: I am

Associate Editor of THE TRIBUNE-NEWS, a newspaper of general circulation published at Holbrook, County of Navajo and State of Arizona; that

Public Notice You Have A Voice In Air Pollution Control In Arizona **Legal #3365**

attached hereto, was published in said newspaper, THE TRIBUNE-NEWS, for **2** issues and said notice was published in the regular and entire issue of every number of the paper during the period of the time of publication and was published in the newspaper proper and not in a supplement, the first

publication being dated **June 10, 2015,**

and the last publication being dated **June 17, 2015**.

Publication Dates: **6/10,17**

Linda Kor, Associate Editor

SUBSCRIBED AND SWORN TO before me this **17th** day of **June, 2015.**

Debbie Barger
NOTARY PUBLIC

My commission expires July 31, 2015.

DEBBIE BARGER
NOTARY PUBLIC - ARIZONA
NAVAJO COUNTY
My Commission Expires
July 31, 2015

PUBLIC NOTICE
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ADEQ will make a final decision on the proposed permit and SIP revision following consideration of all comments received during the public notice period. Everyone commenting will receive notification of the final decision along with a responsiveness summary. People who file comments on the permit will have the right to appeal the final decision as an appealable agency action to the Office of Administrative Hearing (OAH) pursuant to §41.1092.03, and the appeal must be filed within thirty (30) days after the issuance of the final decision. The OAH may sustain, modify, or reverse the final decision.

For questions or more information, or if you would like to receive copies of future public notices of air pollution control permits, please provide your name, address, and ZIP code, or e-mail address to Balaji Vaidyanathan, (602) 771-4527, toll free (800) 234-5677, via e-mail bv1@azdeq.gov or in writing to the ADEQ address above. In order to receive future public notices of air pollution control permits, your request should state that you wish your name to be placed on the air quality permit mailing list.

To request an auxiliary aid or service for accessible communication, please contact Alicia Pollard at (602) 771-4791 or ataap@azdeq.gov or dial 7-1-1 for TTY/TTD Services.
3365-T6/10,17

Appendix F.2

Public Hearing Agenda

ADEQ Arizona Department of Environmental Quality

Public Hearing Agenda

AIR QUALITY DIVISION

PUBLIC HEARING ON THE PROPOSED SIGNIFICAN PERMIT REVISION NO. 61713 AND ARIZONA REGIONAL HAZE SIP REVISION for Arizona Public Service Company – Cholla Generating station

Location:
Public Works Complex, 100 West Public Works Drive, Holbrook, AZ 86025
July 13, 2015

Pursuant to 40 CFR § 51.103 notice is hereby given that the above referenced meeting is open to the public.

1. Welcome and Introductions
2. Purposes of the Oral Proceeding
3. Procedure for Making Public Comment
4. Brief overview of the proposed permit and draft state implementation plan revision
5. Oral Comments
6. Adjournment of Oral Proceeding

Copies of the proposal are available for review at the Arizona Department of Environmental Quality (ADEQ) Library, 1110 W. Washington St., Phoenix, Arizona, and at http://azdeq.gov/cgi-bin/vertical.pl. For additional information regarding the hearing please contact Balaji Vaidyanathan, (602) 771-4527, toll free (800) 234-5677, via e-mail bv1@azdeq.gov.

ADEQ Arizona Department of Environmental Quality

Public Hearing Agenda

AIR QUALITY DIVISION

PUBLIC HEARING ON THE PROPOSED SIGNIFICAN PERMIT REVISION NO. 61713 AND ARIZONA REGIONAL HAZE SIP REVISION for Arizona Public Service Company – Cholla Generating station

Location:
ADEQ, Conference Room 3175 A-B, 1110 West Washington Street, Phoenix, AZ 85007.

July 14, 2015

Pursuant to 40 CFR § 51.103 notice is hereby given that the above referenced meeting is open to the public.

1. Welcome and Introductions
2. Purposes of the Oral Proceeding
3. Procedure for Making Public Comment
4. Brief overview of the proposed permit and draft state implementation plan revision
5. Oral Comments
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Appendix F.3

Public Hearing Sign-In Sheet

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Please PRINT CLEARLY to Receive a Copy of the Final Decision and Response Summary

APS Cholla Permit #61713 — **Monday, July 13, 2015**

FACILITY/PERMITTEE COUNTY FULL NAME	MAILING ADDRESS	CITY AND STATE	ZIP CODE*
Navajo Chuck Moore	Navopache Electric Cooperative 1878 W. White Mountain Blvd	Lakeside, AZ	85929
Chas Spell - APS	400 N. 5th St. MS 9303	Phoenix	85004
Janet Dean APS	2200 E Huntington Flagstaff AZ 86001	→	→
ED SCHAL - APS	P.O. BOX 188, JOSEPH CITY, AZ	→	86032
Nelson Miller APS RT	P.O. Box 233 Joseph City, AZ	AZ	86032
Paul Watson	PO Box 2116 ~~WINSLOW~~ PINETOP, AZ	PINETOP, AZ	85935
Pascal Berliaux	Navajo County		
Jason Whiting Navajo County	PO Box 668 Snowflake, AZ 85937	Snowflake	85937
BILL LAWSON	1407 W NORTH TEMPLE	SALT LAKE CITY UT	84116
Mike Denson.	"	"	"

*** DECISION AND SUMMARY WILL NOT BE MAILED WITHOUT A CORRECT ZIP CODE**

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Please PRINT CLEARLY to Receive a Copy of the Final Decision and Response Summary

APS Cholla Permit #61713 — **Tuesday, July 14, 2015**

	FACILITY/PERMITTEE COUNTY FULL NAME	MAILING ADDRESS	CITY AND STATE	ZIP CODE*
1	Bruce Polkowsky	1610 Little Raven St Unit 308	Denver CO	80202
2	John Curran	3742 E Janelle Ct	Gilbert AZ	85298
3	Sandy Bahr	514 W Roosevelt St	Phoenix AZ	85006
4	Amanda McCoy	18224 W Hatcher Rd	Waddell AZ	85355
5	Joseph Catalano	1200 S Riordan Ranch st	Flagstaff, AZ	86001
6	Kevin Dahl	NPCA 738 N. Fifth Ave #222	Tucson AZ	85705
7	Michael Denby	501 N. 5th Street, Phx ~~85007~~	Phx, AZ	85007
8	Mark Hajduk	"	Phx, AZ	85007
9	Michael Kafka	"	"	"
10	Michelle Kollenpo	400 N 5th St	Phx AZ	85004
11	Gary Crane	1617 N. 11th Ave ~~AZ~~	phx AZ	85007
12	Jeanne Devine	3223 S McAllister	Tempe, AZ	85282
13	Anna Rose Johnson Hinojosa	48 W. Hillside St	Mesa, AZ	85201
14	Dr. Kathy Lynn Mohr-Hinojosa Ph.D	48 W. Hillside St	Mesa, AZ	85201

*** DECISION AND SUMMARY WILL NOT BE MAILED WITHOUT A CORRECT ZIP CODE**

Appendix F.4

Public Hearing Officer Certification and Transcript

ADEQ
Arizona Department
of Environmental Quality

Air Quality Division

Public Hearing Presiding Officer Certification

I, Wayne Bixler, the designated Presiding Officer, do hereby certify that the public hearing held by the Arizona Department of Environmental Quality was conducted on July 13, 2015, at the Public Works Complex, 100 West Public Works Drive, Holbrook, AZ 86025, in accordance with public notice requirements by publication in the *The Tribune News* beginning June 10, 2015. Furthermore, I do hereby certify that the public hearing was recorded from the opening of the public record through concluding remarks and adjournment, and the transcript provided contains a full, true, and correct record of the above-referenced public hearing.

Dated this 16th day of July, 2015.

Wayne D. Bixler

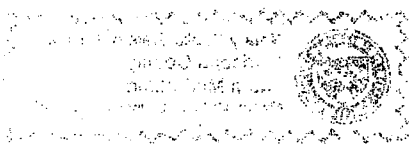
State of Arizona)
) ss.
County of Maricopa)

Subscribed and sworn to before me on this 16 day of July, 2015.

Notary Public State of Arizona
Maricopa County
Laura McFarland
My Commission Expires 04/02/2016

Laura McFarland
Notary Public

My commission expires: 4-2-2016



ADEQ
Arizona Department
of Environmental Quality

Air Quality Division

Public Hearing Presiding Officer Certification

I, Wayne Bixler, the designated Presiding Officer, do hereby certify that the public hearing held by the Arizona Department of Environmental Quality was conducted on July 14, 2015, at the Arizona Department of Environmental Quality, Conference Room 3175, 1110 West Washington Street, Phoenix, AZ 85007, in accordance with public notice requirements by publication in the *The Tribune News* beginning June 10, 2015. Furthermore, I do hereby certify that the public hearing was recorded from the opening of the public record through concluding remarks and adjournment, and the transcript provided contains a full, true, and correct record of the above-referenced public hearing.

Dated this 16th day of July, 2015.

Wayne Bixler

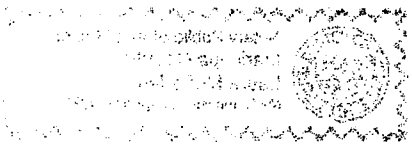
State of Arizona)
) ss.
County of Maricopa)

Subscribed and sworn to before me on this 16 day of July 2015.

Notary Public State of Arizona
Maricopa County
Laura McFarland
My Commission Expires 04/02/2016

Laura McFarland
Notary Public

My commission expires: 4-2-2016



PUBLIC HEARING FOR
AIR QUALITY PERMIT NO. 61713
AND
REGIONAL HAZE SIP REVISION
for
APS - Cholla Generating Station

Today is Monday, July 13, 2015. The time is 6.00 pm. The location is the Public Works Complex, 100 West Public Works Drive, Holbrook, AZ 86025. My name is Wayne Bixler and I have been appointed by the Director of the Department of Environmental Quality to preside at this public hearing. This hearing is to provide you an opportunity to make verbal comments or submit written statements regarding the proposed issuance of Air Quality Permit No. 61713 and the associated draft Regional Haze state implementation plan revision for APS Cholla Generating Station.

Representing the Department this evening are myself; Balaji Vaidyanathan, Manager Air Permits Section, and Feng Mao, Senior Air Quality Modeler. We will be available after the hearing to answers any questions you nay have.

By law, a public hearing must be conducted "on the record". Therefore, the proceedings being recorded.

Because this is a public hearing, the purpose is to obtain comments from you. Therefore, we will not be answering questions during the public hearing. If you have questions about the matter being addressed in this hearing, please include them in your comment.

If you wish to comment, please fill out a speaker's slip which is available on the information table at the back of the room and bring it forward to us. This will allow everyone an opportunity to be heard and allow us to match the name on the official record with you, the speaker.

Individuals will be called in the order in which the speaker slips have been submitted. Please print your name clearly to help ensure that it is spelled correctly for the record.

You may also submit written comments this evening. If you have written comments, you may give them to us after the hearing. Written comments can also be mailed or hand delivered to the Department at the following address:

Balaji Vaidyanathan, Manager
Air Quality Permits Section
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Written comments that are mailed must be postmarked no later than July 14, 2015. Comments that are hand delivered must be received on or before that date.

By law, all comments made here or in writing are considered by the Department before making a final decision on the proposed permit and SIP revision. The Department's response to your comments comes later in the process when the Department evaluates your verbal and written

comments in writing. This document is known as the responsiveness summary. It is available at the time that the Department makes a final decision on the permit. If you wish to be notified of the decision made by the Department, please be sure to sign-in on the attendance sheet located on the information table.

The agenda for this hearing is as follows. First, Mr. Vaidyanathan will give a brief presentation on the nature and content of the proposed permit and SIP revision. Then I will begin to call speakers in the order in which I received the slips.

Now Mr. Vaidyanathan will brief overview of the draft permit and the SIP revision:

Thank you Wayne, Good Evening, My name is Balaji Vaidyanathan, and I'm the Manager of the Air Permits Section, for ADEQ. I will give you a brief description of the proposed permit revision to be issued to the APS Cholla Generating Station, The permit revision will form the basis for ADEQ's proposed Regional Haze state implementation plan revision as it related to Nitrogen Oxide emissions from the Cholla facility.

The EPA's federal implementation plan required APS and PacifiCorp to install selective catalytic reduction controls to minimize nitrogen oxides emissions by December 5, 2017. Considering the tremendous costs involved in the technology, as well as other competing regulatory obligations, APS and PacifiCorp submitted an Application for a Significant Permit Revision and best available retrofit technology Reassessment for Cholla to ADEQ. The proposed revision, besides being more cost effective, is expected to provide greater long-term environmental benefits.

Under the proposal, the control strategies include:

1. Unit 2 is required to be permanently shut down retired by no later than April 1, 2016.

2. Coal or fuel oil or used oil burning at Units 1, 3, and 4 will be discontinued by April 30, 2025.

3. And Lastly by July 31, 2025, any or all of Units 1, 3, and 4 may be converted to pipeline-quality natural gas combustion, after permanent discontinuation of coal, and fuel oil burning. Upon such conversion, these Units shall not operate at a capacity factor greater than 20 percent.

In its assessment ADEQ found that the Cholla best available control technology Reassessment will result in greater long-term emission reductions than the EPA's FIP. Additionally the proposal will result in greater long-term visibility benefits compared to EPA FIP for all 13 Class I areas. The Regional Haze Rule sets a goal of achieving natural visibility conditions at every Class I area by 2064, and the EPA has directed States programs to make incremental, reasonable progress toward that goal. The Cholla best available control technology reassessment will result in significant long-term visibility improvements, which are consistent with the long-term goals and plans of the Regional Haze Rule.

The state implementation plan and the associated permit revisions will become effective following EPA's approval and final action rescinding their FIP. Thank you

1. Nelson Miller: I'm Nelson Miller, I'm retired from APS several years ago, but I worked there on their environmental projects so I know what your talking about, environmental wise, but I also live in Joe City, so I'm right next to the power plant and so, my question, I hear the recent supreme court ruling talking about ,they're overstepping their bounds on a lot of stuff, so I'm ____how that's going to play out. But I just wrote a list of what, what I saw, and I don't know if this has ever been there, .but I think it pretty accurate, if we end up shutting down 4 units at Cholla. This is how many people will be put out of work, approximately 250 aps people, I'd say probably 30 contract maintenance people, 10 Salt River Materials people, coal mine, I don't know how many of the coal mines is there but it's a lot of people in the coal mine, and the people that haul lime, probably 2 or 3 people will be out of work, and I put 10 railroad employees cause I won't be hauling coal anymore. So you're talking about a lot of people loosing there jobs but what you're talking about doing and so my question is, Are these ever weighed in caparison to what you're trying to accomplish. Because ,here's what is going to be the accomplishment out of doing all of this. The consumer get higher electric rates the government has more, that has to depend on them, it's a lost situation what were trying to do. I appreciate you guys, though you're trying to help us out, I see ADEQ fighting for Cholla. For a lot of the stuff that's coming down is coming from higher up and so I appreciate what you do, and so my other questions is why Arizona may be, I don't know, if you'll address this, why we're #2, I read the list of how much everyone had to reduce, we're # 2 in the nation, Arizona, why did they pick on Arizona to reduce so much, is the question I have, my guess I can asked that after the thing, and so that's just some of my comments that, Cause I have a lot of friends that live over there and you're affecting their lives, a lot of them, that's what I'm saying, probably over 350 people and so , I know the government doesn't care about that it seems like.but it should be considered. So that what I had to say. Thank you

2. Ed Seal –Comments attached

3.Pasqual Berlioux: Good afternoon, thank you very much for allowing us to be here tonight My name is Pasqual Berlioux, I am the Executive irector for the Eastern Arizona County Organization, the organization currently includes 5 counties, Apache, Navajo, Graham, Greenlee, Gila and a sixth county is in the process of joining the organization, Cochise County, the organization has been involved, in many natural resource issues and economic development government issues and obviously court generations. Is an issue we fits on both, natural resource base economy because coal is a natural resource. And obviously the economy economic impact on the county at large, because if you look at the power generation foot point, in Arizona most of the generation is coal based, and most of the coal base generation **essentially** located within ---the equal county the Cholla Power Plant is obviously located right here in Navajo County, Coronado Generating Station is in ---Apache County, Springerville Generating Station in Springerville, the Page Generating Station is as we know in the tribal portfolio, which is --- big part of the economy impact on the counties. Cochise Generating Station is within Cochise County and so on and so on. Eastern AZ counties organization is a ------involved and --- interested issues of the Coronado Generating Station ---------===, the issues of the June 2015, 14 last EPA draft EPA rule and so on. And before getting into any specific details I think that the foremost message that the organization leadership would like to share with you. Is that Eastern AZ counties greatly appreciates the leadership demonstrated by ADEQ. In working on behalf of the state constitute working with the industry partners APS, SRP, TEP and **essentially**working with the state of Arizona, In a ways which is not in conflicting with its industry of players, but which is . --- so that all possible requirement are met not only the legal requirement under EPA, but the economic requirement. The sustanabilty of the various communities that depend heavily

on these ------station to ----this countries existence. So that's a –war blanket statement that applies to virtually ever coal generating station in Arizona but its important for ADEQ to realize that your efforts are deeply appreciated and there is a very strong backing from local elected official for the leadership role that you're playing., as come to the Cholla power Plant, eastern Arizona counties are very much in support of the revision to the SIP, State Implementation Plan, as well as revision to specific permit for Cholla. We believed that we have the situation maybe which is similar to the one we saw relatively recently with Coronnado Generating Station at St Joes. Where technical requirements that were proposed by the federal agencies, simply did not provide measureable increment in the ecology benefits. While having a very measureable catastrophic affect on the economic property of equation and therefore we believe that ---these lopsided decisions. Where a doubtful ecological benefit may or may not.be derived by certainty of a very substantial negative impact on the economy this situation needs to be measured very carefully. And we again appreciate the role ADEQ is playing in bringing a measure of rational and dispassionate analysis in this situation we therefore believe that ADEQ and APS analysis of the alternative which has been proposed to the federal plan , this alternative is we believe is extremely valuable, it does not seem to sacrifice any of the legal requirements and it certainly provides and very tangible social economy benefit for the plant and for the area. Therefore we are pleased to endorse the proposal meant by ADEQ and APS. As concern the plant for Cholla as well as the SIP. And we will be happy to provide you with a written statement to that matter, Thank you very much for your time.

4. Jason Whiting: This all I want to reiterate , my name is Jason Whiting, I sit on the Navajo County Board of Supervisor, I represent Joseph City, Holbrook, Woodruff, Snowflake/Taylor, Shimway, over in the White Mountain Lake, a lot of the people I represent work out here this power plant , I want to say thank you to ADEQ\, they've been good partners not only as it relates to this, but in many areas. Byron James has been and excellent representative on behalf you guys in this region. We appreciate the partnership that we enjoy with him, and we appreciate your forward thing in trying to advocate on behalf of the Cholla Power Plant as well as the state of Arizona, as we work with these federal agencies, so thank you for your efforts. Also want to thank APS publically for their support, they've been very supportive to this region in way of jobs in a way of tax base and a way of just being involve in our communities. APS has been a great partner in Navajo County as well as in the surrounding areas but we certainly appreciate them, I want to ---for of course my support, as far as all the public services proposal alternative, application revised AQ control permit #53399 for the Cholla Generating Station, we also offer our support for the states propose revision state implementation plan and strongly encourage the AZ Dept. of Environmental Quality to approve both actions, its important to know --- earlier some comments , in addition to the 250 jobs that they supply to this area over 1000 megawatts are supplies to the State of Arizona by this power plant addition over 30 million dollars in economic activity occur from this power plant and over 50 million dollar in state, local and federal taxes are paid each year. The Cholla Power Plant is a part of the backbone in Navajo County and important to us we appreciate your efforts, we certainly support the revision and we support APS in doing so, I guess I 'll give this to you afterwards in a statement I would like to provide as well.

Thank you for attending the hearing this evening; your interest is appreciated. It is now 6:30 PM. This public hearing is adjourned.

Arizona Public Service Company (APS) appreciates the opportunity to provide comments in support of the Arizona Department of Environmental Quality's (ADEQ) proposed revision to the State Regional Haze Implementation Plan and the Significant Permit Revision for the Cholla Power Plant (Cholla) Air Quality Control Permit. APS owns Cholla Units 1, 2, and 3 and is the operating agent for Unit 4, which is wholly owned by PacifiCorp. APS has an ongoing and essential duty to our customers, employees, and the communities we serve to ensure that we operate Cholla in a manner that balances the ability to provide reliable and affordable energy with meeting increasingly stringent environmental regulations. Because the actions being proposed by ADEQ deliver this balance in the most logical and sensible manner, APS supports these actions.

On February 28 2011, ADEQ submitted its Regional Haze State Implementation Plan (SIP) to the U.S. Environmental Protection Agency (EPA). In the proposed Arizona SIP, ADEQ determined that the dry, low-NOx burners, which dramatically reduce nitrogen oxide emissions and had already been installed on the Cholla units, met the best available retrofit technology (BART) requirements of the regional haze regulations. On July 20, 2012, EPA proposed to partially approve and partially disapprove the Arizona SIP and issued a proposed Federal Implementation Plan (FIP). EPA proposed to approve the BART requirements for sulfur dioxide and particulate matter emission limits contained in the Arizona SIP, but disapprove the state's proposed BART determination for nitrogen oxides. EPA determined that dry, low-NOx burners did not constituent BART at the Cholla power plant and that the installation and operation of expensive selective catalytic reduction (SCR) technology was required.

APS disagreed with EPA's determination that SCRs were necessary to meet the BART requirements. On September 18, 2012, APS submitted extensive comments and supporting documents regarding EPA's proposed BART FIP. APS questioned EPA's legal authority to overrule the state's BART determination and identified numerous areas where we believe EPA

erred in its analysis, including EPA's cost-effectiveness analysis and visibility modeling. Furthermore, APS stated in its comments that requiring the installation of SCRs at Cholla would significantly challenge the economic viability of the plant. Notwithstanding these comments, EPA finalized its Arizona BART FIP on December 5, 2012 and required the installation and operation of SCR by the end of 2017 to meet BART requirements. In addition, EPA added a new removal efficiency requirement for sulfur dioxide that had not been previously proposed.

In response to the EPA's action, and in conjunction with PacifiCorp, APS conducted a BART reassessment to develop a more reasonable approach than what is currently required by the EPA BART FIP. The BART reassessment resulted in the actions that are being proposed in the revised State Regional Haze SIP and the Cholla Air Quality Control Permit. We decided to take these actions only after a careful evaluation of all the potential options to comply with the regional haze rule.

APS's BART reassessment will result in increased visibility improvement over the current BART requirements for NOx imposed on Cholla Units 2, 3, and 4 under the FIP. Where the FIP contemplates the Cholla BART units will use coal as fuel until at least 2037, the BART reassessment calls for Unit 2 to shut down permanently in less than a year, and Units 3 and 4 to cease burning coal in less than 10 years. In addition, while Unit 1 is not BART-eligible and, thus, not subject to the FIP, the use of coal at the unit also will end by April 2025. As evidenced by the BART reassessment modeling, the visibility benefits resulting from these proposed actions will exceed those available under the FIP. Moreover, the BART reassessment achieves all of this in a much more cost-effective manner for customers, while allowing APS and its customers sufficient time to recoup the significant emission control investments already made in the units.

In closing, I would like to summarize three important points related to the proposed actions. First, the BART reassessment allows Cholla to continue to operate in an economical fashion for a longer period than what would occur under the current EPA FIP, and it establishes the ability to convert the units to natural gas at a future date if it is determined that doing so makes economic sense. Second, it ensures the continued operation of Cholla for an additional seven years beyond the BART compliance date, thereby extending the life of an economic asset

and preserving an important source of tax revenue and economic activity for the local community. Third, the BART reassessment will result in a greater long-term environmental benefit than what would be obtained under the EPA FIP.

APS appreciates the considerable effort that ADEQ has put forth in developing the BART reassessment proposal and the outreach by ADEQ to assure it develops the best possible outcome. Once again, APS appreciates the opportunity to provide comments.

Ed Seal
Cholla Plant Manager

PUBLIC HEARING FOR
AIR QUALITY PERMIT NO. 61713
AND
REGIONAL HAZE SIP REVISION
for
APS - Cholla Generating Station

Today is Tuesday, July 14, 2015. The time is 1:30 PM. The location is ADEQ, Conference Room 3175 A-B, 1110 West Washington Street, Phoenix, AZ 85007. My name is Wayne Bixler and I have been appointed by the Director of the Department of Environmental Quality to preside at this public hearing. This hearing is to provide you an opportunity to make verbal comments or submit written statements regarding the proposed issuance of Air Quality Permit No. 61713 and the associated draft Regional Haze state implementation plan revision for APS Cholla Generating Station.

Representing the Department this evening are myself; Balaji Vaidyanathan, Manager Air Permits Section and Feng Mao, Sr. Air Quality Modeler. We will be available after the hearing to answers any questions.

By law, a public hearing must be conducted "on the record". Therefore, the proceedings here are being recorded.

Because this is a public hearing, the purpose is to obtain comments from you. Therefore, we will not be answering questions during the public hearing. If you have questions about the matter being addressed in this hearing, please include them in your comment.

If you wish to comment, please fill out a speaker's slip which is available on the information table at the back of the room and bring it forward to us. This will allow everyone an opportunity to be heard and allow us to match the name on the official record with you, the speaker.

Individuals will be called in the order in which the speaker slips have been submitted. Please print your name clearly to help ensure that it is spelled correctly for the record.

You may also submit written comments this evening. This afternoon, excuse me, If you have written comments, you may give them to us after the hearing. Written comments can also be mailed or hand delivered to the Department at the following address:

Balaji Vaidyanathan, Manager
Air Quality Permits Section
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Written comments that are mailed must be postmarked no later than July 14, 2015. Comments that are hand delivered must be received on or before that date also.

By law, all comments made here or in writing are considered by the Department before making a final decision on the proposed permit and SIP revision. The Department's response to your comments comes later in the process when the Department evaluates your verbal and written comments in writing. This document is known as the responsiveness summary. It is available at

the time that the Department makes a final decision. If you wish to be notified of the decision made by the Department, please be sure to sign-in on the attendance sheet located on the information table.

The agenda for this hearing is as follows. First, Mr. Vaidyanathan will give a brief presentation on the nature and content of the proposed permit and SIP revision. Then I will begin to call speakers in the order in which I received the slips.

Now Mr. Vaidyanathan will provide a brief overview of the draft permit and the SIP revision:

Balaji Vaidyanathan: Thank you very much, Good afternoon, Thank you for coming. My name is Balaji Vaidyanathan. I'm the Manager of the Air Permits Section, for ADEQ. I will be giving you a brief description of a significant permit revision proposed to be issued to the APS Cholla. The permit revision will form the basis for ADEQ's proposed Regional Haze SIP revision as it related to NOx emissions from the Cholla facility.

The EPA's FIP required APS and PacifiCorp to install selective catalytic reduction technology on the BART affected Units to control nitrogen oxides emissions by December 5, 2017. Considering the costs of selective catalytic reduction technology, as well as other competing regulatory obligations, APS and PacifiCorp submitted an Application for a Significant Permit Revision and best available retrofit technology Reassessment for Cholla to ADEQ. The proposed revision, besides being more cost effective, is expected to provide greater long-term environmental benefits.

Under this propose rule, the set of control strategies include:

1. Unit 2 is required to be permanently shut down retired by no later than April 1, 2016.

2. Coal or fuel oil or used oil burning at Units 1, 3, and 4 will be discontinued by April 30, 2025.

3. But July 31, 2025, any or all of Units 1, 3, and 4 may be converted to pipeline-quality natural gas combustion. Upon such conversion, these Units shall not operate at a capacity factor greater than 20 percent.

ADEQ reviewed the application materials and determined that the application for significant permit revision and BART Reassessment met all applicable state and federal regulatory requirements. ADEQ also concurred with APS and PacifiCorp that low NOx burners with separated over-fired air is the best available retrofit technology for Cholla Units 3 and 4.

ADEQ additionally found that Cholla best available retrofit technology Reassessment will result in greater long-term emission reductions for NOx than the EPA's FIP. Due to the above emission reductions, the proposal from APS will result in greater long-term visibility benefits as compared to EPA FIP for all 13 Class I areas. The Regional Haze Rule sets a goal of achieving natural visibility conditions at every Class I area by 2064, and the EPA has directed States to make incremental, reasonable progress toward that goal. The Cholla BART Reassessment will result in significant long-term visibility benefits, which are consistent with the long-term goals and plans of the Regional Haze Rule.

The proposed state implementation plan revisions and the associated permit revisions will become effective upon EPA's approval of the proposal and final action from EPA rescinding the current FIP was in place.

Kevin Dahl

Thank you for this opportunity to speak today, I'm Kevin Dowell, I'm the senior program manager for National Parks Conservation Association. Since 1919 this non profit and non-partisan organization has been the leading advocate - guarding out national parks, NPCA and its 1 million supporters work to protect the preserve our nation's natural, historical and cultural heritage for future generation. NPCA and Sierra Club have jointly submitted detail comments today via our counsel Earthjustice, so my brief comments today are to just offer a few highlights. First of all Bravo to Arizona Public Service Company and Pacific Corp for making plans to end using coal at the aging Cholla Power Plant. Cholla is the nation's worse park polluter. And it also impacts communities through out Northern Arizona, closing one unit next year and either closing the others or converting to cleaner natural gas, two of them is admirable thing to do. However it is disappointed to see this proposal take a step back, which the plant must do more to comply with the clean air act, and do right by this region.in the interim period before the closure or conversion. Our nation set a goal back in the 1970's to clean up the air and our most treasured national landscapes knowing that doing so, we would also stop the impact of air pollution on our health. Cholla should have install additional pollution controls that are economical and been required at most other coal fired plants in the nations allowing more time for the plant to continue to harm Arizona's residents, visitors, is not acceptable. Finally another thank you to the utilities for reaching out to our organization and others to discuss the issues during the last few months, while it seems like we didn't have enough time to find a solution that all could accept, it was a good effort that we truly appreciate. Thank you.

Sandy Bahr: I am Sandy Bahr. I am chapter director for Sierra Club Grand Canyon which is the Arizona Chapter. We have about 35 thousand members and supporters in Arizona and 2.4 million nationwide. First of all I want to thank the ADEQ for holding a hearing in Phoenix on this issue recognizing the statewide and really the nationwide significant of pollution from the Cholla Plant. I did want to encourage you to consider and evening meeting for the future, because I think more people who are really interested in seeing these power plants cleaned up could attend. So, regarding the proposal before you today, we think that the, and I forgot to mention that we also submitted detailed written comments of ---- notice, so I will be brief. The environmental protection agency current regional haze plan requires Cholla to install, what are highly effective pollution control selective catalytic reduction in 2017. This will significantly improve the air quality at many of Arizona's world renowned natural parks and wilderness areas. The ADEQ new proposal allows 2 units at Cholla to continue operating for the next 10 years, without updated pollution controls. Now the proposal basically disregards the additional controls and even though its clear that these could be cost effectively installed. This means that more pollution is allowed for a longer period of time from the plan. That is really unacceptable, and contraire to the clean air act which does not allow back sliding. Compare to EPA's existing plan, Arizona proposal would lead to increase air pollution and worse visibility impairment, the Cholla Plant which we know is owned by APS and Pacific Corp is currently one of the nations words sources of visibility impairment at national parks and wilderness areas, according to the national parks services Cholla impairs air quality at 13 national parks and wilderness areas, including our own Petrified Forest National Park and Grand Canyon National Park. While we are encourage by the utilities commitment to stop burning coal at Cholla this proposal would result in the increase air pollution for almost 2 decades that additional pollution is at the expense of Arizona's parks

and public health. Arizona should require APS and Pacific Corp to promptly install addition cost effective pollution control on units 3 and 4 at Cholla. Thank you

John Curan: Good Afternoon my name is John Curran, I'm the Maricopa County Chapter director for Organizing for Action, basically we're here, just in support of things that Sandy had said- support – we're a national issue advocacy group and just happy to be able to be here and speak in support of the Sierra Club. That's all I have to say.

Jeanine Devine: My name is Jean Devine, and I am a senior obviously and ---- but that's not so obvious, I'm also a member of the National Park Association and a member of the Sierra Club which I very strongly support in its stand here today. And I just wanted to say I hiked up Rocky Mountain National Park a few weeks ago, it was really beautiful in Colorado, so I hope to hike Grand Canyon again also, and I'm a long term resident of Arizona, owner of solar panels which I bought with a home equity loan about 8 years ago to save money in my retirement and to join people all over the world who are working against global warming. I completely support the clean air and clean water acts. And I'm working with others to build international support for green energy in Arizona in the United States and in the world. The coal industries and utilities that use coal will loose money just as the tobacco industries lost money. But the solid scientific evidence for the human contribution to global warming has been around for many years. It's past time for the utilities to invest much more in clean energy research and change to solar and wind energy there is a time for corporation to make profits but this is not one of them Those who continue to promote the use of coal energy risk the health and lives of people who live near the coal plants and of those who work the mines. And of those who travel to our national parks and beautiful places I am ----by the dedication, wisdom of those who created our national parks. The Cholla Power Plant has a very damaging impact on smog, clouding, and sandy, clouding the national parks and wilderness areas that any other coal fire plant power plant in our country. I love Arizona, I love the Grand Canyon
and the Petrified Forest National Parks, I want to enjoy their desert skies with clear air and I want the same for all of our children and grandchildren. So I ask you to support all pollution reduction proposed by the EPA for the Cholla Power Plant. Thank you

Kathy Moore Alameda: I am going to be representing myself, I am feeling fairly angry today because, well, I got send across the street, but more importantly, I'm angry because our government is not serving the interest of the people rather they're serving corporate interest so I want it to stop. That's all I have to say.

Anna Rose Moore: My name is Anna Rose Moore Alameda, I am totally ---, I live in Mesa and I am going into 8th grade next semester, I committed to stopping further damage to our climate because I want to enjoy a healthy planet. I want a future where my children, my grandchildren, and their children, children will know what it is to breathe clean air, drink pure water, enjoy nutritious food and dwell in a stable environment with lots of diversity. Desert skies in Arizona Natural parks must have the highest level of air quality protection, tragically the air at parks, including the Petrified Forest and the Grand Canyon is dirty on many days of the year because we burn coal to power our civilization. On dirty air days people can't see across the Grand Canyon and the people through out the state, as my father, my cousins, and 6 of my classmate find it difficult to breathe. In 2012 the EPA took action to restore clean at the Grand Canyon and other wilderness area. When it rejected Arizona's weak dirty air plan the EPA submitted a stronger federal plan in its place, which requires the Cholla Power Plant into installing modern and cost effective pollution controls as required by the clean air act. The EPA's plan will lead to much needed, and much improved air quality at one of our countries most beautiful national

parks the Grand Canyon, Now the state of Arizona wants to redo the air quality plan for Cholla at the utilities request rather than require Cholla to install highly effective pollution controls, Arizona new plan would require Cholla unit 2 to require by 2016, so allows Cholla units 3 & 4 to run without additional pollution controls until 2025, then in 2025 the utilities would either switch units 3 & 4 to natural gas or retire the units. I'm glad that the utilities seek to stop running coal at Cholla, but their solution is a little too late. I'm against Arizona's plan because it will increase air pollution for 20 years, time we can't afford to waste in the mist of the climate crisis, Compare to EPA's plan, the clean air act prohibits states, from leaking in existing plans in this manner, to protect the Grand Canyon, one of the seven natural wonders of world and to comply with the clean air act, Arizona must require Cholla Units 3 & 4 to install more pollutions controls now before they stop burning coal in 2025. This would have dramatic benefits for air quality in our deserts, human health, of our plants the animals, the water and the land itself will also benefit form this – pollution control. Perhaps, most importantly installing additional pollution on Cholla will have significant positive impact on the climate crisis. I had been to Havasupai, and the canyon it an incredible place, spiritually, we all need a place need a, a place to refresh, and reconnect with the natural world. I just spend several days at Yosemite and I feel like my time there was --- how its suppose to be, playing in the crystal clear water no cell phones, no electronic games, just me and my cousins and the fish I could see swimming at the bottom of 20 foot pool. The only reason why I could have this experience is because smart people like John Muir made sure this place was protected for me and all future generations. The wild beast and birds are not the property nearly of the people who are alive today but the property of unknown generations whose belongings we have no right to squander. We have a similar obligation in this moment in history as stewards of the Grand Canyon and global atmosphere, the decisions we make today on the coal fire – and in Arizona, will have an impact the ability to future generations to enjoy and be recharged by the Grand Canyon and other Arizona Wilderness areas places, that enforcement in clean air act in Arizona means my generation will inherit a world of sick water --- polluted land and air dense with carbon. If we do not take the necessary steps including a crisp pollution control at Cholla to help the climate crisis now, the sacrifices of the beauty of our natural world and human health to corporate greed and government in action is an unimaginable tragedy, please enforce the clean air act in Arizona now

Thank you for attending the hearing this evening; your interest is appreciated. It is now 1:55 pm. This public hearing is adjourned.

Appendix F.5

Comments Submitted by the Public

Comments Received by E-mail

June 22, 2015 - Ed Rogers

let cholla keep burning coal and file for a waiver and/or change in the standards law when obama leaves office. that would let unit 1 keep burning coal and let the others burn coal. we all know this is a bunch of bad science.file for a waiver or change in the standards law that the epa dug up somewhere to support there bs that cholla was ruining the view at the grand canyone or polluting too much. have aps embrace new clean coal burning solutions that would allow them to continue burning coal . the coal industry is always improving the methods for using coal for energy .
as a last resort shut down unit 1 while fighting the air quality standards if they havent been changed by the time comes to shut down unit 1. if it shuts down keep a maintence crew on it so it can be fired back up when you get a waiver or change in the standards law
fight for the changes needed to keep burning coal
ed rogers 1008 bales avenue winslow,az 86047
im glad you allowed emails. in some cases its not possible for everyone to travel to the county complex

June 29, 2015 - Ed Rogers

In a loss for the Obama administration, the Supreme Court ruled that the EPA unreasonably interpreted the Clean Air Act when it decided to set limits on the emissions of toxic pollutants from power plants without first considering the costs of the industry to do so.
fiu
edward rogers winslow
fight for a change in the regs. keep burning coal at cholla the existing standards dont go into effect till somtine after obama leaves office
fit

June 29, 2015 - Ed Rogers

THIS SHOULD BE A GAME CHANGER AS FAR AS APS SHUTTING DOWN UNIT 1 In a loss for the Obama administration, the Supreme Court ruled that the EPA unreasonably interpreted the Clean Air Act when it decided to set limits on the emissions of toxic pollutants from power plants without first considering the costs of the industry to do so. « less
ED ROGERS WINSLOW AZ

June 29, 2015 - Ed Rogers

supreme courts rule against epa on mercury and something else limits
ed rogers winslow

June 29, 2015 - Fred Morris

I am all for keep our environment clean and safe for not only us, but for future generations. I worked at the Cholla Power Plant for 36 years and witnessed APS going above and beyond what was required by the EPA. They installed bag houses and upgraded scrubbers on units 1, 3 and 4 and had everything in place to upgrade unit 2 when the EPA wanted more pollution controls installed in the way of SCR's. So the decision was made to just shut it down instead of spending the money to upgrade the scrubber and to install a bag house. The SCR's were to be installed to lower the NOx

haze. The SCR's in effect would double the haze of another sort. Ammonia is what is used to make the SCR's work and that is what the haze would be plus the extra cost for its operation. APS and all coal fired plants, are required to have continuous emissions monitoring. These emissions are recorded and monitored by the EPA. All one has to do is to get this history and you can see that these plants are well within the required parameters of what is required by the EPA. The only emission that cannot by controlled is CO and engineers are working on that issue to find a solution. The EPA continues to put more and more restrictions on coal plants to put them out of business. This will drive the cost of electricity up to where none of us will be able to afford electrical power. The cost of producing electricity with coal fired plants is reasonable for now until other resources are developed. The lower cost of electricity as of now, I believe, out ways the effects to the environment. I am all for continuing the production of electricity with the use of coal. They are clean and economical.

Thank you for considering my comments.

A concerned citizen of Arizona,

Fred Morris

July 13, 2015 - Bill Lawson

Here are PacifiCorp's comments on the state's proposal. Please let me know that you have received this email. (Comments attached)

Thanks

Bill Lawson
PacifiCorp
Director, Environmental Services
(801) 220-4581; Cell (801) 694-8850

July 14, 2015 -Michael Hiatt

Mr. Vaidyanathan – Earthjustice respectfully submits the attached comments on the proposed Cholla Power Plant BART reassessment on behalf of National Parks Conservation Association and Sierra Club. If you have any difficulty opening the attached comments or exhibits, please let me know. (Comments attached)

Thanks,

Michael Hiatt
Staff Attorney
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July 14, 2015 Fred Morris

There needs to be some way of having checks and balances on the EPA. For instance, the management at the Cholla plant the other day was worried that a catch basin might overflow, which

would cause them to receive a fine from the EPA. The reason that it was about to overflow was, we had a rainstorm that produce a lot of water. The basin was about to overflow with rainwater!!! What kind of pollutant is rainwater?
I believe that Arizona needs to take its state back. We need economical power and coal is the best source at this time. Our coal plants in Arizona are clean, economical and reliable. They need your help to stay in operation and to keep the lights on for the citizens of Arizona.
Sincerely,

Fred Morris

July 14, 2015 Graham McCahan

Dear Mr. Vaidyanathan:

Attached please find the comments of Environmental Defense Fund and Western Resource Advocates on the Draft Revision to the Arizona State Regional Haze State Implementation Plan and Significant Permit Revision No. 61713 to Air Quality Control Permit No. 53399 for Arizona Public Service Company for the Cholla Generating Station. Thank you for your careful consideration of these comments. Please do not hesitate to contact us if you have any questions.
(Comments attached)

Sincerely,
Graham McCahan

July 14, 2015 Stephanie Smith

Good evening, Balaji,

The purpose of this email is to provide comments on the proposed permit revisions for the Cholla Plant. Please confirm receipt.

In support of improving and maintaining healthy air quality standards in the region and reducing reliance on fossil fuels, the City of Flagstaff supports the shutdown of the coal-fired Unit 2 boiler by April 1, 2016. Additionally, the City supports the discontinuation of burning coal in Units 1, 3, and 4 and prefers an expedited transition of these Units.

Flagstaff endorses a shift away from coal and diversification of APS' energy portfolio. However, we are concerned about impacts of other potential fuel sources (including natural gas extraction methods), the volatility of natural gas prices and the need for adequate modeling of air quality impacts with all future fuel sources.

Please do not hesitate to contact me with any questions.

Have a nice day,
Stephanie
City of Flagstaff
211 W. Aspen Avenue
Flagstaff, AZ 86001
P: (928) 213-2078
ssmith@flagstaffaz.gov

PUIBLIC COMMENTS

Public Hearing on July 13, 2015

The Public Works Complex, 100 West Public Works Drive, Holbrook, AZ 86025

1. Nelson Miller:

I'm Nelson Miller, I'm retired from APS several years ago, but I worked there on their environmental projects so I know what your talking about, environmental wise, but I also live in Joe City, so I'm right next to the power plant and so, my question, I hear the recent supreme court ruling talking about, they're overstepping their bounds on a lot of stuff, so I'm ____how that's going to play out. But I just wrote a list of what, what I saw, and I don't know if this has ever been there, .but I think it pretty accurate, if we end up shutting down 4 units at Cholla. This is how many people will be put out of work, approximately 250 aps people, I'd say probably 30 contract maintenance people, 10 Salt River Materials people, coal mine, I don't know how many of the coal mines is there but it's a lot of people in the coal mine, and the people that haul lime, probably 2 or 3 people will be out of work, and I put 10 railroad employees cause I won't be hauling coal anymore. So you're talking about a lot of people loosing there jobs but what you're talking about doing and so my question is, Are these ever weighed in caparison to what you're trying to accomplish. Because, here's what is going to be the accomplishment out of doing all of this. The consumer get higher electric rates, the government has more, that has to depend on them, it's a lost situation what were trying to do. I appreciate you guys, though you're trying to help us out, I see ADEQ fighting for Cholla. For a lot of the stuff that's coming down is coming from higher up and so I appreciate what you do, and so my other questions is why Arizona may be, I don't know, if you'll address this, why we're #2, I read the list of how much everyone had to reduce, we're # 2 in the nation, Arizona, why did they pick on Arizona to reduce so much, is the question I have, my guess I can asked that after the thing, and so that's just some of my comments that, Cause I have a lot of friends that live over there and you're affecting their lives, a lot of them, that's what I'm saying, probably over 350 people and so , I know the government doesn't care about that it seems like. But it should be considered. So that's what I had to say. Thank you

2. Ed Seal

Comments attached.

3. Pasqual Berlioux

Good afternoon, thank you very much for allowing us to be here tonight My name is Pasqual Berlioux. I am the Executive Director for the Eastern Arizona County Organization, the organization currently includes 5 counties, Apache, Navajo, Graham, Greenlee, Gila and a sixth county is in the process of joining the organization, Cochise County, the organization has been involved, in many natural resource issues and economic development government issues and obviously court generations. Is an issue we fits on both, natural resource base economy because coal is a natural resource. And obviously the economy economic impact on the county at large, because if you look at the power generation foot point, in Arizona most of the generation is coal based, and most of the coal base generation essentially located within ----the equal county the Cholla Power Plant is obviously located right here in Navajo County, Coronado Generating Station is in ---Apache County, Springerville Generating Station in Springerville, the Page Generating Station is as

we know in the tribal portfolio, which is --- big part of the economy impact on the counties. Cochise Generating Station is within Cochise County and so on and so on. Eastern AZ counties organization is a ------involved and --- interested issues of the Coronado Generating Station ---------===, the issues of the June 2015, 14 last EPA draft EPA rule and so on. And before getting into any specific details I think that the foremost message that the organization leadership would like to share with you. Is that Eastern AZ counties greatly appreciates the leadership demonstrated by ADEQ. In working on behalf of the state constitute working with the industry partners APS, SRP, TEP and essentiallyworking with the state of Arizona, In a ways which is not in conflicting with its industry of players, but which is . --- so that all possible requirement are met not only the legal requirement under EPA, but the economic requirement. The sustainability of the various communities that depend heavily on these ------station to ----this countries existence. So that's a –war blanket statement that applies to virtually ever coal generating station in Arizona but its important for ADEQ to realize that your efforts are deeply appreciated and there is a very strong backing from local elected official for the leadership role that you're playing., as come to the Cholla power Plant, eastern Arizona counties are very much in support of the revision to the SIP, State Iimplementation Plan, as well as revision to specific permit for Cholla. We believed that we have the situation maybe which is similar to the one we saw relatively recently with Coronado Generating Station at St Joes. Where technical requirements that were proposed by the federal agencies, simply did not provide measureable increment in the ecology benefits. While having a very measureable catastrophic affect on the economic property of equation and therefore we believe that ---these lopsided decisions. Where a doubtful ecological benefit may or may not.be derived by certainty of a very substantial negative impact on the economy this situation needs to be measured very carefully. And we again appreciate the role ADEQ is playing in bringing a measure of rational and dispassionate analysis in this situation we therefore believe that ADEQ and APS analysis of the alternative which has been proposed to the federal plan, this alternative is we believe is extremely valuable, it does not seem to sacrifice any of the legal requirements and it certainly provides and very tangible social economy benefit for the plant and for the area. Therefore we are pleased to endorse the proposal meant by ADEQ and APS. As concern the plant for Cholla as well as the SIP. And we will be happy to provide you with a written statement to that matter, Thank you very much for your time.

4. Jason Whiting

This all I want to reiterate, my name is Jason Whiting, I sit on the Navajo County Board of Supervisor, I represent Joseph City, Holbrook, Woodruff, Snowflake/Taylor, Shimway, over in the White Mountain Lake, a lot of the people I represent work out here this power plant, I want to say thank you to ADEQ\, they've been good partners not only as it relates to this, but in many areas. Byron James has been and excellent representative on behalf you guys in this region. We appreciate the partnership that we enjoy with him, and we appreciate your forward thing in trying to advocate on behalf of the Cholla Power Plant as well as the state of Arizona, as we work with these federal agencies, so thank you for your efforts. Also want to thank APS publically for their support; they've been very supportive to this region in way of jobs in a way of tax base and a way of just being involve in our communities. APS has been a great partner in Navajo County as well as in the surrounding areas but we certainly appreciate them, I want to ---for of course my support, as far as all the public services proposal alternative, application revised AQ control permit #53399 for the Cholla Generating Station, we also offer our support for the states propose revision state implementation plan and strongly encourage the AZ Dept. of Environmental Quality to

approve both actions, its important to know --- earlier some comments , in addition to the 250 jobs that they supply to this area over 1000 megawatts are supplies to the State of Arizona by this power plant addition over 30 million dollars in economic activity occur from this power plant and over 50 million dollar in state, local and federal taxes are paid each year. The Cholla Power Plant is a part of the backbone in Navajo County and important to us we appreciate your efforts, we certainly support the revision and we support APS in doing so, I guess I'll give this to you afterwards in a statement I would like to provide as well. (Comments attached)

PUIBLIC COMMENTS
Public Hearing on July 14, 2015
At ADEQ, 1110 West Washington St., AZ 85007

1. Kevin Dahl

Thank you for this opportunity to speak today, I'm Kevin Dowell, I'm the senior program manager for National Parks Conservation Association. Since 1919 this non profit and non-partisan organization has been the leading advocate - guarding out national parks, NPCA and its 1 million supporters work to protect the preserve our nation's natural, historical and cultural heritage for future generation. NPCA and Sierra Club have jointly submitted detail comments today via our counsel Earthjustice, so my brief comments today are to just offer a few highlights. First of all Bravo to Arizona Public Service Company and Pacific Corp for making plans to end using coal at the aging Cholla Power Plant. Cholla is the nation's worse park polluter. And it also impacts communities through out Northern Arizona, closing one unit next year and either closing the others or converting to cleaner natural gas, two of them is admirable thing to do. However it is disappointed to see this proposal take a step back, which the plant must do more to comply with the clean air act, and do right by this region.in the interim period before the closure or conversion. Our nation set a goal back in the 1970's to clean up the air and our most treasured national landscapes knowing that doing so, we would also stop the impact of air pollution on our health. Cholla should have install additional pollution controls that are economical and been required at most other coal fired plants in the nations allowing more time for the plant to continue to harm Arizona's residents, visitors, is not acceptable. Finally another thank you to the utilities for reaching out to our organization and others to discuss the issues during the last few months, while it seems like we didn't have enough time to find a solution that all could accept, it was a good effort that we truly appreciate. Thank you. (Comments attached)

2. Sandy Bahr:

I am Sandy Bahr. I am chapter director for Sierra Club Grand Canyon which is the Arizona Chapter. We have about 35 thousand members and supporters in Arizona and 2.4 million nationwide. First of all I want to thank the ADEQ for holding a hearing in Phoenix on this issue recognizing the statewide and really the nationwide significant of pollution from the Cholla Plant. I did want to encourage you to consider and evening meeting for the future, because I think more people who are really interested in seeing these power plants cleaned up could attend. So, regarding the proposal before you today, we think that the, and I forgot to mention that we also submitted detailed written comments of ---- notice, so I will be brief. The environmental protection agency current regional haze plan requires Cholla to install, what are highly effective pollution control selective catalytic reduction in 2017. This will significantly improve the air quality at many of Arizona's world renowned natural parks and wilderness areas. The ADEQ new proposal allows 2 units at Cholla to continue operating for the next 10 years, without updated pollution controls. Now

the proposal basically disregards the additional controls and even though its clear that these could be cost effectively installed. This means that more pollution is allowed for a longer period of time from the plan. That is really unacceptable, and contraire to the clean air act which does not allow back sliding. Compare to EPA's existing plan, Arizona proposal would lead to increase air pollution and worse visibility impairment, the Cholla Plant which we know is owned by APS and Pacific Corp is currently one of the nations words sources of visibility impairment at national parks and wilderness areas, according to the national parks services Cholla impairs air quality at 13 national parks and wilderness areas, including our own Petrified Forest National Park and Grand Canyon National Park. While we are encourage by the utilities commitment to stop burning coal at Cholla this proposal would result in the increase air pollution for almost 2 decades that additional pollution is at the expense of Arizona's parks and public health. Arizona should require APS and Pacific Corp to promptly install addition cost effective pollution control on units 3 and 4 at Cholla. Thank you.

3. John Curran

Good Afternoon my name is John Curran, I'm the Maricopa County Chapter director for Organizing for Action, basically we're here, just in support of things that Sandy had said- support – we're a national issue advocacy group and just happy to be able to be here and speak in support of the Sierra Club. That's all I have to say.

4. Jeanine Devine

My name is Jean Devine, and I am a senior obviously and ---- but that's not so obvious, I'm also a member of the National Park Association and a member of the Sierra Club which I very strongly support in its stand here today. And I just wanted to say I hiked up Rocky Mountain National Park a few weeks ago, it was really beautiful in Colorado, so I hope to hike Grand Canyon again also, and I'm a long term resident of Arizona, owner of solar panels which I bought with a home equity loan about 8 years ago to save money in my retirement and to join people all over the world who are working against global warming. I completely support the clean air and clean water acts. And I'm working with others to build international support for green energy in Arizona in the United States and in the world. The coal industries and utilities that use coal will loose money just as the tobacco industries lost money. But the solid scientific evidence for the human contribution to global warming has been around for many years. It's past time for the utilities to invest much more in clean energy research and change to solar and wind energy there is a time for corporation to make profits but this is not one of them Those who continue to promote the use of coal energy risk the health and lives of people who live near the coal plants and of those who work the mines. And of those who travel to our national parks and beautiful places I am ----by the dedication, wisdom of those who created our national parks. The Cholla Power Plant has a very damaging impact on smog, clouding, and sandy, clouding the national parks and wilderness areas that any other coal fire plant power plant in our country. I love Arizona, I love the Grand Canyon

and the Petrified Forest National Parks, I want to enjoy their desert skies with clear air and I want the same for all of our children and grandchildren. So I ask you to support all pollution reduction proposed by the EPA for the Cholla Power Plant. Thank you

5. Kathy Mohr Almeida

I am going to be representing myself, I am feeling fairly angry today because, well, I got send across the street, but more importantly, I'm angry because our government is not serving the interest of the people rather they're serving corporate interest so I want it to stop. That's all I have to say.

6. Anna Rose Mohr Almeida:

My name is Anna Rose Moore Alameda, I am totally ---, I live in Mesa and I am going into 8th grade next semester, I committed to stopping further damage to our climate because I want to enjoy a healthy planet. I want a future where my children, my grandchildren, and their children, children will know what it is to breathe clean air, drink pure water, enjoy nutritious food and dwell in a stable environment with lots of diversity. Desert skies in Arizona Natural parks must have the highest level of air quality protection, tragically the air at parks, including the Petrified Forest and the Grand Canyon is dirty on many days of the year because we burn coal to power our civilization. On dirty air days people can't see across the Grand Canyon and the people through out the state, as my father, my cousins, and 6 of my classmate find it difficult to breathe. In 2012 the EPA took action to restore clean at the Grand Canyon and other wilderness area. When it rejected Arizona's weak dirty air plan the EPA submitted a stronger federal plan in its place, which requires the Cholla Power Plant into installing modern and cost effective pollution controls as required by the clean air act. The EPA's plan will lead to much needed, and much improved air quality at one of our countries most beautiful national parks the Grand Canyon, Now the state of Arizona wants to redo the air quality plan for Cholla at the utilities request rather than require Cholla to install highly effective pollution controls, Arizona new plan would require Cholla unit 2 to require by 2016, so allows Cholla units 3 & 4 to run without additional pollution controls until 2025, then in 2025 the utilities would either switch units 3 & 4 to natural gas or retire the units. I'm glad that the utilities seek to stop running coal at Cholla, but their solution is a little too late. I'm against Arizona's plan because it will increase air pollution for 20 years, time we can't afford to waste in the mist of the climate crisis, Compare to EPA's plan, the clean air act prohibits states, from leaking in existing plans in this manner, to protect the Grand Canyon, one of the seven natural wonders of world and to comply with the clean air act, Arizona must require Cholla Units 3 & 4 to install more pollutions controls now before they stop burning coal in 2025. This would have dramatic benefits for air quality in our deserts, human health, of our plants the animals, the water and the land itself will also benefit form this – pollution control. Perhaps, most importantly installing additional pollution on Cholla will have significant positive impact on the climate crisis. I had been to Havasupai, and the canyon it an incredible place,

spiritually, we all need a place need a, a place to refresh, and reconnect with the natural world. I just spend several days at Yosemite and I feel like my time there was --- how its suppose to be, playing in the crystal clear water no cell phones, no electronic games, just me and my cousins and the fish I could see swimming at the bottom of 20 foot pool. The only reason why I could have this experience is because smart people like John Muir made sure this place was protected for me and all future generations. The wild beast and birds are not the property nearly of the people who are alive today but the property of unknown generations whose belongings we have no right to squander. We have a similar obligation in this moment in history as stewards of the Grand Canyon and global atmosphere, the decisions we make today on the coal fire – and in Arizona, will have an impact the ability to future generations to enjoy and be recharged by the Grand Canyon and other Arizona Wilderness areas places, that enforcement in clean air act in Arizona means my generation will inherit a world of sick water --- polluted land and air dense with carbon. If we do not take the necessary steps including a crisp pollution control at Cholla to help the climate crisis now, the sacrifices of the beauty of our natural world and human health to corporate greed and government in action is an unimaginable tragedy, please enforce the clean air act in Arizona now.

William K. Lawson
1407 W. North Temple, Suite 210
Salt Lake City, Utah 84116
801-220-4581

July 13, 2015

Balaji Vaidyanathan
Air Quality Permits Section Manager
Arizona Department of Environmental Quality
1110 West Washington Street, 3415A-1
Phoenix, AZ 85007

Email: bv1@azdeq.gov

RE: Proposed Arizona Regional Haze State Implementation Plan and Cholla Plant Significant Permit Revision

Dear Mr. Vaidyanathan:

PacifiCorp submits these comments in support of the proposals (the Proposals) by the state of Arizona, as they relate to Cholla Unit 4, to: (i) revise the Arizona State Regional Haze State Implementation Plan; and (ii) to revise the Significant Permit Revision No. 61713 to Air Quality Control Permit No. 53399 for the Cholla Generating Station. PacifiCorp wholly owns Cholla Unit 4 for which Arizona Public Service Company (APS) serves as the operating agent.

PacifiCorp supports the Proposals for Cholla Unit 4 for the reasons included in the application dated March 12, 2015, as filed by APS (APS Application), and also for the reasons stated in the Proposals. In addition, PacifiCorp emphasizes the following:

- Assuming conversion of Cholla Unit 4 to natural gas in 2025, the BART Reassessment included in the APS Application and the Proposals demonstrates that the 2018 installation of SCR is not a cost-effective BART alternative. ($10,538/ton). The same is true for SNCR ($7,091/ton). APS Application, Appendix A at p. 1-2. For these reasons, Arizona should continue to reject SCR and SNCR as BART at Cholla Unit 4.

- The Proposals represent a stand-alone BART Reassessment for Cholla Unit 4 that is independent of the prior BART determination and state implementation plan (SIP) by the state of Arizona, and also independent of the federal implementation plan (FIP) issued by EPA. As such, no requirement exists to compare the Proposals against those other plans. Rather, the Proposals rise or fall on their own merits.

- Because some insist on comparing portions of the Proposals against portions of the prior plans, it is worth noting that, when compared to the installation of SCR as assumed under the FIP, the BART Reassessment for Cholla Unit 4 results in a greater dV improvement during 30 of the 38 years over the period 2008 through 2046. In addition, the BART

Reassessment results in more tons removed of SO2, NOx and PM. As noted in the draft SIP included in the Proposals, "Overall, the long-term visibility benefits are greater with the Cholla BART Reassessment than the EPA FIP." This alone is a sufficient basis upon which Arizona should accept the BART Reassessment for Cholla Unit 4 and approve the Proposals.

- While some commenters may suggest otherwise, it is improper for Arizona to require Cholla Unit 4 also to achieve dV improvements during the time period 2018 – 2025 that are equivalent to the installation of SCR or SNCR. The Proposals are not intended or required to achieve more emission reductions and better visibility improvements in every year as compared to the FIP requirements. Moreover, as explained in the APS Application, the BART Reassessment as a whole and over the life of Cholla Unit 4 will produce better visibility improvements than would the requirement to install SCR or SNCR. As noted in the draft SIP included in the Proposals, "Overall, the long-term visibility benefits are greater with the Cholla BART Reassessment than the EPA FIP." Draft SIP at p. 23.

- The BART Reassessment clearly demonstrates that the installation of LNB/OFA and the future conversion of Unit 4 to natural gas significantly reduce the costs of complying with the regional haze requirements while providing visibility improvements above and beyond those that would be provided had SCR or SNCR been installed. When considering the cost of installing controls, which is a necessary part of every BART analysis, Arizona should accept the BART Reassessment for Cholla Unit 4.

PacifiCorp urges Arizona to adopt the Proposals.

Sincerely,

William K. Lawson

EARTHJUSTICE

ALASKA CALIFORNIA FLORIDA MID-PACIFIC NORTHEAST NORTHERN ROCKIES
NORTHWEST ROCKY MOUNTAIN WASHINGTON, DC INTERNATIONAL

July 14, 2015

Submitted via electronic mail

Balaji Vaidyanathan
Air Quality Permits Section Manager
Arizona Department of Environmental Quality
1110 West Washington Street, 3415A-1
Phoenix, AZ 85007

Re: Arizona Regional Haze Plan Revision for Cholla Power Plant

Dear Mr. Vaidyanathan:

On behalf of National Parks Conservation Association and Sierra Club (collectively, the "Conservation Organizations"), Earthjustice respectfully submits the following comments regarding the Arizona Department of Environmental Quality's (ADEQ) proposed Best Available Retrofit Technology (BART) "reassessment" for the Cholla Power Plant.

Cholla is one of the worst visibility-impairing coal plants in the nation, and the Conservation Organizations strongly support Arizona Public Service Company (APS) and PacifiCorp's commitment to stop burning coal at Cholla. Unfortunately, compared to Cholla's existing BART requirements, ADEQ's proposal would result in greater air pollution and worse visibility impairment at Arizona's national parks and wilderness areas for nearly two decades after the BART compliance deadline. The proposal thus weakens Cholla's existing BART determination in violation of the Clean Air Act's anti-backsliding provision. *See* 42 U.S.C. § 7410(*l*). Fortunately, ADEQ's analysis shows it would be cost effective to install updated pollution controls that would substantially reduce Cholla Unit 3 and 4's pollution before they stop burning coal in 2025. At a minimum, Selective Non-Catalytic Reduction (SNCR) controls should be BART. Moreover, a proper analysis shows that highly-effective Selective Catalytic Reduction (SCR) controls are the "best available" controls and should be BART. Accordingly, in order to ensure the BART "reassessment" complies with the Act, ADEQ should revise its BART determination and require Units 3 and 4 to install these updated, cost-effective pollution controls by the BART compliance deadline.

BACKGROUND

I. The Clean Air Act's Regional Haze Program

Americans have long valued our nation's diverse and stunning natural scenery. John Copeland Nagle, *The Scenic Protections of the Clean Air Act*, 87 N.D. L. Rev. 571, 576 (2011). In what has been lauded as "America's best idea," Congress first set aside national parks in the 19th century to preserve and celebrate some of the nation's most spectacular scenery. *Id.* With

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the nation's rapid industrialization, however, these remarkable scenic views have become increasingly marred by air pollution. *See id.* at 573. Today, air pollution is "perhaps the greatest threat to national parks," and pollution all too often degrades visibility in these iconic scenic areas. *Id.*

To reduce this threat to national parks and other treasured public lands, Congress amended the Clean Air Act in 1977. 42 U.S.C. § 7491. Congress determined that national parks, wilderness areas, and other "Class I" federal areas should enjoy the highest level of air quality, and it set a national goal of eliminating all human-caused visibility impairment at these areas. *Id.* § 7491(a)(1). After concluding that the states and the U.S. Environmental Protection Agency (EPA) had not made adequate progress toward reducing visibility impairment caused by regional haze, Congress again amended the Clean Air Act in 1990 to spur regional haze reductions. *Id.* § 7492.

One of the primary mechanisms to reduce regional haze is the Clean Air Act's requirement that certain disproportionately-dirty sources install Best Available Retrofit Technology (BART) pollution controls. 42 U.S.C. § 7491(b)(2)(A); 40 C.F.R. § 51.308(e). A source is "BART-eligible" if it is within one of 26 source categories, it was built between 1962 and 1977, and it has the potential to emit 250 tons per year (tpy) or more of any air pollutant. 42 U.S.C. § 7491(b)(2)(A), (g)(7); 40 C.F.R. § 51.301. EPA's regulations define BART as "an emission limitation based on the degree of reduction achievable through the application of the *best* system of continuous emission reduction." 40 C.F.R. § 51.301 (emphasis added). States and EPA must consider five factors when making BART determinations: (1) the costs of compliance, (2) the energy and non-air quality environmental impacts, (3) existing pollution controls in use at the source, (4) the source's remaining useful life, and (5) the reasonably anticipated visibility improvements. 42 U.S.C. § 7491(g)(2); 40 C.F.R. § 51.308(e)(1)(ii)(A).

BART is an essential component of the regional haze program because Congress largely grandfathered the antiquated sources subject to BART into many of the Clean Air Act's requirements. *See* 2005 Regional Haze Rule, 70 Fed. Reg. 39,104, 39,111 (July 6, 2005). Consequently, many of these older sources have insufficient pollution controls. BART compels these disproportionately-polluting sources to promptly install up-to-date and cost-effective pollution controls. 42 U.S.C. § 7491(b)(2)(A), (g)(4) (sources must install BART controls "as expeditiously as practicable but in no event later than five years").

On December 5, 2012, EPA finalized the BART determination for the Cholla Power Plant. Final BART Rule, 77 Fed. Reg. 72,512 (Dec. 5, 2012). For nitrogen oxides (NOx) pollution, EPA's BART determination requires Cholla Units 2-4 to meet a 0.055 lb/MMBtu emission limit, determined on a 30-day rolling average across all three units. *Id.* at 72,514–15. EPA found that Cholla can cost-effectively achieve this BART emission limit by installing SCR controls on all three units. *See, e.g., id.* at 72,543–46. EPA set a five-year compliance deadline for its BART determination, which requires Cholla to comply with the BART emission limits by December 5, 2017. *Id.* at 72,578.[1]

[1] On April 9, 2013, EPA granted APS's and PacifiCorp's petitions for reconsideration on a discrete compliance methodology issue regarding whether the BART emission limit should be averaged across

II. Cholla's Visibility, Economic, and Public Health Impacts

Arizona is home to a wealth of iconic national parks and wilderness areas, such as Grand Canyon, Saguaro, and Petrified Forest National Parks. Cholla emits large amounts of air pollution that obscures the renowned scenic views at these Class I areas. *See, e.g.*, Proposed BART Rule, 77 Fed. Reg. 42,834, 42,860 (July 20, 2012) (Cholla Units 2-4 collectively emit over 9,400 tpy of NOx pollution). According to the National Park Service, Cholla's visibility impacts "rank among [the] highest of any facility we have evaluated under the BART program."[2] In total, Cholla Units 2-4 cause an 18.3 deciview (dv) cumulative visibility impact across 13 Class I areas in Arizona and nearby states. Proposed BART Rule, 77 Fed. Reg. at 42,861. These substantial visibility impacts include a 4.53 dv impact at Petrified Forest National Park, a 2.22 dv impact at Grand Canyon National Park, and a 1.46 dv impact at Capitol Reef National Park. *Id.*

The national parks and wilderness areas impacted by Cholla's air pollution preserve the region's most inspiring landscapes, rare geological formations, and diverse flora and fauna. Each of these Class I areas is entitled to the highest level of air quality under the Clean Air Act. *See, e.g.*, 42 U.S.C. §§ 7470(2), 7475(a)(5), (d)(2), 7491, 7492. EPA's BART determination complies with this Clean Air Act mandate by significantly decreasing the visibility impairment caused by Cholla. For example, EPA's BART determination for Cholla will improve visibility by approximately 1.34 dv at Petrified Forest and by 1.06 dv at the Grand Canyon. Proposed BART Rule, 77 Fed. Reg. at 42,861. In total, EPA's BART determination for Cholla will result in a cumulative visibility improvement of over 7 dv across the 13 impacted Class I areas. *Id.*

Arizona's renowned national parks and wilderness areas are important components of the state's economy. In 2014, more than 4.7 million people visited the Grand Canyon, and this tourism supported more than 7,840 jobs and more than $509 million in visitor spending.[3] More than 836,000 people visited Petrified Forest last year, which supported more than 715 jobs and $51 million in visitor spending.[4] Studies show that national park visitors prioritize enjoying beautiful scenery when visiting national parks and will visit parks less during hazy conditions.[5] EPA's BART determination for Cholla will noticeably improve visibility at Arizona's national parks and wilderness areas, and thereby increase revenue to the parks and surrounding communities.

Reducing air pollution from Cholla will also improve public health. The same pollutants that mar scenic views at national parks and wilderness areas also cause significant public health

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Cholla's three BART units. The BART determination remains in place, and EPA has not yet taken any further action to implement a new compliance methodology.

[2] ADEQ Regional Haze SIP at App. E, pdf page 43 (NPS Comments on Cholla BART Analysis and Determination at page 1).

[3] Catherine Cullinane Thomas et al., Nat'l Park Serv., *2014 National Park Visitor Spending Effects* 19 (2015) (Ex. 1), *available at* http://www.nature.nps.gov/socialscience/economics.cfm.

[4] *Id.* at 23.

[5] Abt Assocs. Inc., *Out of Sight: The Science and Economics of Visibility Impairment* 32–34 (2000) (Ex.2), *available at* http://www.catf.us/resources/publications/files/Out_of_Sight2.pdf.

impacts. For example, NOx pollution is a precursor to ground level ozone, which is associated with respiratory diseases, asthma attacks, and decreased lung function. In addition, NOx reacts with ammonia, moisture, and other compounds to form particulates that can cause and worsen respiratory diseases, aggravate heart disease, and lead to premature death.[6] The Clean Air Task Force estimates that Cholla's overall air pollution causes 10 deaths, 16 heart attacks, and 190 asthma attacks every year.[7] The NOx reductions required by EPA's BART determination will reduce the serious public health toll Cholla imposes on Arizonans.[8]

DISCUSSION

On December 5, 2012, EPA issued the final BART determination for Cholla Power Plant. EPA's BART determination requires Cholla Units 2-4 to install and operate SCR controls by December 5, 2017. APS and PacifiCorp have concluded that installing SCR to comply with the BART determination would not be cost effective.[9] Instead, the utilities have determined that it would be more cost effective to comply with BART by retiring Units 2-4 by the December 2017 compliance deadline.[10] The utilities' analysis shows that retiring Cholla by December 2017 is more cost effective than installing SCR, even though the utilities' current coal contract contains a liquidated damages provision if Cholla stops burning coal before the contract ends in 2024.[11]

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6 EPA, Health – Nitrogen Dioxide, http://www.epa.gov/air/nitrogenoxides/health.html (last visited July 13, 2015) (Ex. 3).

7 Clean Air Task Force, Death and Disease From Power Plants, http://www.catf.us/fossil/problems/power_plants/ (last visited July 13, 2015) (Ex. 4).

8 Dr. George Thurston, Professor of Environmental Medicine at New York University School of Medicine, prepared an expert report on the significant public health benefits that would result from installing SCR at the nearby Navajo Generating Station (NGS) under the haze program. Dr. George D. Thurston, *Written Report Regarding the Proposed Navajo Generating Plant EPA Rulemaking* (Dec. 12, 2013) (Ex. 5). As just one example of the haze program's public health benefits, Dr. Thurston concluded that installing SCR at NGS would save between 2 to 5 lives every year, with total public health-based economic benefits of between $14 million and $34 million annually. *Id.* at 21.

9 *See, e.g.*, PacifiCorp, *2015 Integrated Resource Plan (IRP) Vol. III*, at 44 (2015) (Ex. 6) ("PacifiCorp's financial analysis shows that installation of SCR by an assumed compliance date of December 5, 2017, is not a cost effective solution for customers when evaluated against a range of compliance alternatives."), *available at* http://www.pacificorp.com/es/irp.html; *see also* Ariz. Pub. Serv. Co., *2014 Integrated Resource Plan (IRP)* 71 (2014) (Ex. 7) ("[I]t may be beneficial to retire the Cholla Power Plant or convert it to natural gas operation."), *available at* http://www.aps.com/en/ourcompany/ratesregulationsresources/resourceplanning/Pages/resource-planning.aspx; *id.* at 62 ("While continued operation of Cholla in the Base Portfolio would require $360 million in pollution control upgrades, conversion of the plant to natural gas is expected to cost $199 million including a new natural gas pipeline.").

10 *See, e.g.*, PacifiCorp, *2015 IRP Vol. III*, at 41 ("[T]he updated 2017 early retirement case is lower cost than installing SCR.").

11 *See, e.g.*, *id.* at 31 (discussing coal contract liquidated damages); APS, *2014 IRP* at 57 (discussing "coal reduction portfolio" scenario where Cholla Units 1 and 3 "would retire December 31, 2024 at the end of their coal contract").

The utilities have concluded that the cheapest course of action overall is to retire Cholla Unit 2 by April 2016, and then continue operating Units 3 and 4 without additional pollution controls until the current coal contract ends in 2024.[12] Then, by April 30, 2025, the utilities would cease burning coal at the remaining Cholla units and either retire the units or switch them to gas.

ADEQ acknowledges that the utilities' preferred course of action would not comply with the existing BART determination for Units 3 and 4, which requires the units to either install SCR or shut down by December 5, 2017.[13] The utilities' solution is to propose an entirely new BART determination for Cholla. This new BART determination, which ADEQ refers to as a BART "reassessment," would supersede the existing BART requirements and allow the utilities to continue burning coal at Cholla Units 3 and 4 for the next ten years without installing any additional pollution controls.

The Conservation Organizations strongly support the utilities' retirement plan to stop burning coal at Cholla. However, ADEQ's proposed BART "reassessment" violates the Clean Air Act because it would allow Units 3 and 4 to continue emitting large levels of pollution long after the BART compliance deadline without installing updated pollution controls. The BART "reassessment" thus violates the Clean Air Act's anti-backsliding provision, as it would result in more pollution and worse visibility impairment than the existing BART determination. 42 U.S.C. § 7410(*l*). In addition, ADEQ's BART analysis is flawed because it rejects SCR and SNCR controls as BART, even though both controls would cost-effectively reduce Unit 3 and 4's NOx pollution before they stop burning coal in 2025.

I. The Cholla BART "Reassessment" Violates The Clean Air Act's Anti-Backsliding Provision By Weakening the Existing BART Determination.

Clean Air Act section 110(*l*) prohibits states and EPA from revising an implementation plan if the revision would weaken the existing plan's requirements. Section 110(*l*) states: "The Administrator shall not approve a revision of a plan *if the revision would interfere with* any applicable requirement concerning attainment and reasonable further progress . . . or *any other applicable requirement of this chapter*." 42 U.S.C. § 7410(*l*) (emphases added). The Ninth Circuit has explained that section 110(*l*) is the Act's "anti-backsliding" provision. *El Comite Para el Bienestar de Earlimart v. EPA*, 786 F.3d 688, 692 (9th Cir. 2015). This anti-backsliding provision applies to existing BART determinations, as the Act's "applicable requirement[s]" include the regional haze program's BART requirements. *See Oklahoma v. EPA*, 723 F.3d 1201, 1204, 1207 (10th Cir. 2013) (BART determinations and other regional haze provisions are "applicable requirement[s]" of the Act).

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[12] *See, e.g.*, PacifiCorp, *2015 IRP Vol. III*, at 44 (PacifiCorp's "preferred compliance alternative" is an "alternate compliance scenario in which Cholla Unit 4 continues operating through early 2025 without the installation of SCR, followed by conversion of the unit to natural gas fueling.").

[13] *See* ADEQ SIP Revision at 4 ("Since the proposed conversion to natural gas-firing at Units 3 and 4 is beyond the five-year window for BART mandated by the CAA and Regional Haze Rule ('RHR'), this control strategy does not directly satisfy the BART option timing requirements for imposing BART.").

EPA has long interpreted section 110(*l*) as preventing implementation plan revisions that would increase overall air pollution or worsen air quality. For example, in *Kentucky Resources Council, Inc. v. EPA*, 467 F.3d 986 (6th Cir. 2006), EPA interpreted section 110(*l*) as allowing the agency to approve a plan revision that weakened some existing control measures while strengthening others, but only "[a]s long as *actual emissions in the air are not increased*." *Id.* at 995 (quoting 70 Fed. Reg. 28,429, 28,430 (May 18, 2005)) (emphasis added). The court upheld EPA's interpretation, which "allow[ed] the agency to approve a SIP *revision unless the agency finds it will make the air quality worse*." *Id.* (emphasis added). The Eleventh Circuit has similarly upheld an EPA interpretation of section 110(*l*) prohibiting plan revisions that would increase emissions or worsen air quality. *Ala. Envtl. Council v. EPA*, 711 F.3d 1277, 1293 (11th Cir. 2013) (EPA interpreted section 110(*l*) to "permit approval of the SIP revision 'unless the agency finds it will make air quality worse'" (quoting 73 Fed. Reg. 60,957, 60,960 (Oct. 15, 2008)); *see also id.* at 1296 (Molloy, J., concurring in part and dissenting in part) (EPA properly concluded a plan revision did not comply with section 110(*l*) when the agency could not rationally determine whether the revision would increase particulate emissions). Moreover, in a short discussion regarding a challenge to the Nevada regional haze plan, the Ninth Circuit indicated that a haze plan that "weakens or removes any pollution controls" would run afoul of section 110(*l*). *WildEarth Guardians v. EPA*, 759 F.3d 1064, 1074 (9th Cir. 2014) (EPA did not err when it failed to make an express finding of non-interference under section 110(*l*), because "nothing in Nevada's SIP . . . weakens or removes any pollution controls").

ADEQ's proposed BART "reassessment" violates section 110(*l*) because it weakens the existing BART determination for Cholla. The proposal would do so by eliminating the requirement that Units 2-4 install highly-effective SCR controls by December 5, 2017. Instead, Unit 2 would retire by April 2016, but Units 3 and 4 would continue operating without any additional pollution controls for the next ten years. As discussed below, the net effect of these new measures is an increase in Cholla's air pollution and an increase in Cholla's visibility impairment for nearly two decades after the BART compliance deadline.

First, the record shows the Cholla BART "reassessment" would increase Cholla's NOx pollution compared to the existing BART determination.[14] Under the BART "reassessment," between 2018 and 2025, Cholla would emit *4,161 tons per year more NOx pollution* than it would under the existing BART determination.[15] In addition, the BART "reassessment" would result in greater cumulative NOx pollution for eighteen years after the BART compliance deadline.[16] Figure 3 from ADEQ's proposal illustrates how the BART "reassessment" would increase Cholla's NOx pollution by allowing Units 3 and 4 to continue operating for the next ten years without installing additional pollution controls.[17]

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14 *See* ADEQ State Implementation Plan (SIP) Revision at 17–20.

15 *Id.* at 18–19.

16 *Id.* at 19.

17 *Id.*

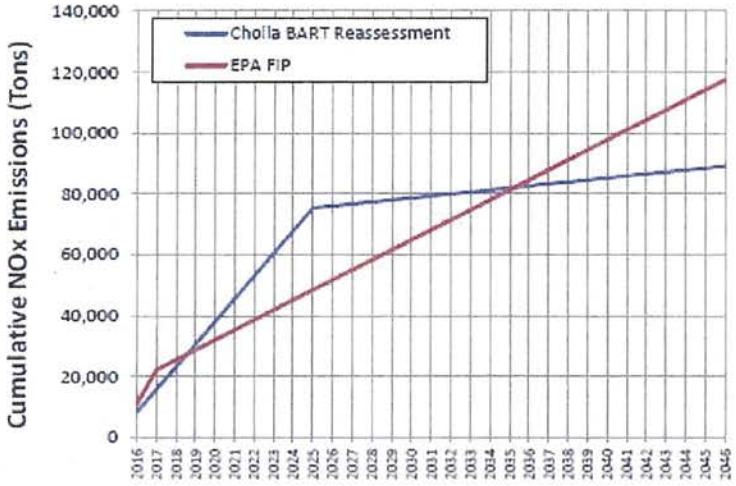

Figure 3 Cumulative NOx Emissions Associated with EPA's FIP vs. Cholla BART Reassessment over 2016-2046

As the Ninth Circuit recently stated, it would not be "difficult[]" to show a section 110(*l*) violation if an existing implementation plan unambiguously required a certain level of pollution reductions, and a plan revision would result in more pollution. *El Comite Para el Bienestar de Earlimart*, 786 F.3d at 696 ("The difficulty with [the] argument" that a revision weakened an existing plan's 20% pollution reduction requirement, is that the existing plan "is ambiguous, because it refers to both a 12% reduction and a 20% reduction."). But this is exactly what would occur under the BART "reassessment," as Arizona's new BART determination would result in an additional 4,161 tpy of NOx pollution for more than seven years after the BART compliance deadline. Moreover, when Cholla's cumulative NOx emissions are considered, the BART "reassessment" would result in increased pollution levels until 2035, which is nearly two decades after the BART deadline.

Second, the record also shows the BART "reassessment" would worsen air quality because it would result in worse visibility conditions than the existing BART determination. The existing BART determination will provide significant visibility benefits beginning immediately after the December 2017 compliance deadline. But for several years after that compliance deadline, the BART "reassessment" would result in worse visibility conditions at Class I areas compared to the existing BART determination.[18] For example, Cholla's air pollution causes the greatest visibility impairment at Petrified Forest National Park, which is the closest Class I area. As Figure 6 to ADEQ's proposal shows, Cholla's visibility impacts at Petrified Forest would be worse under the BART "reassessment" for fifteen years after the BART compliance deadline.[19]

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18 ADEQ SIP Revision at 22.

19 *Id.* at 24.

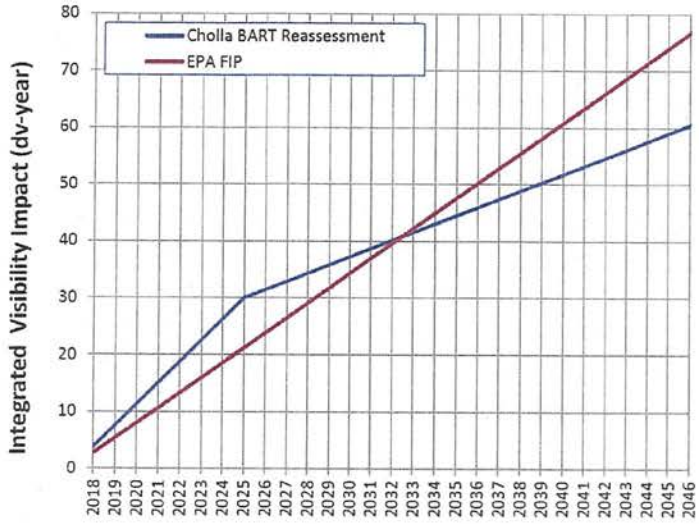

Figure 6 Comparison of Integrated Visibility Impacts at Petrified Forest National Park Associated with EPA FIP vs. Cholla BART Reassessment

The situation is similar at the Grand Canyon. As Figure E-2 to ADEQ's proposal shows, Cholla's visibility impacts at the Grand Canyon would be worse under the BART "reassessment" for twelve years after the BART compliance deadline.[20] Furthermore, ADEQ acknowledges that this same "general pattern" of worse visibility impacts under the reassessment holds true at the other Class I areas impacted by Cholla's air pollution.[21]

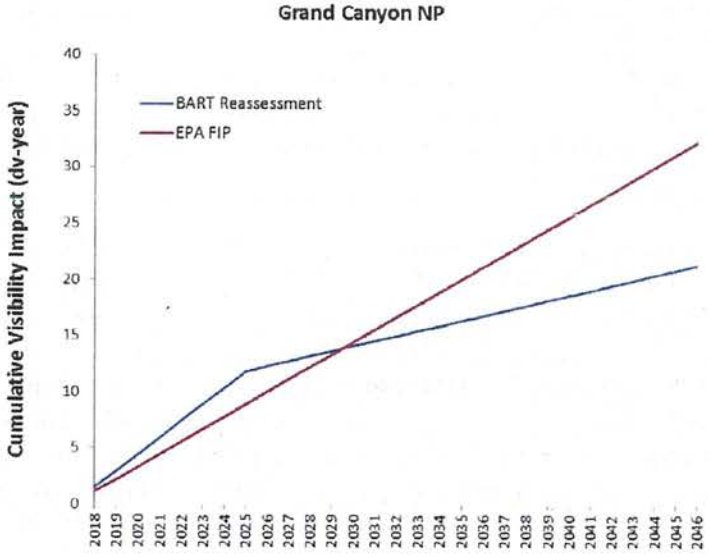

Figure E-2: Plot of Predicted Cumulative Visibility Impacts at Grand Canyon National Park Associated with EPA FIP (red) vs. Proposed BART Reassessment (blue)

20 *Id.* at 83.

21 *Id.* at 23.

ADEQ does not dispute these facts and it acknowledges that compared to the existing BART determination, the BART "reassessment" would cause increased pollution and worse visibility impairment for years after the December 2017 BART compliance deadline.[22] ADEQ attempts to justify the BART "reassessment," however, by pointing to greater long-run visibility and pollution reduction benefits that would materialize in the 2030s and beyond.[23] For example, as Figure 3 above shows, while the BART "reassessment" results in greater cumulative NOx pollution for eighteen years after the BART deadline, beginning in 2035 the proposal would result in less cumulative NOx pollution. *See supra* at 7. ADEQ's conclusion that the BART "reassessment" complies with section 110(*l*) because it will eventually outperform the existing BART determination decades into the future is unreasonable and flawed.

Most fundamentally, ADEQ's conclusion is unreasonable because it inappropriately discounts the timing of pollution reductions and the importance of promptly reducing pollution and improving visibility. The timing of pollution reductions matters under the regional haze program, and pollution reductions that occur far in the future are not equivalent to pollution reductions that occur today. Section 169A's text reflects this common-sense principle, as it requires sources to install BART controls "as expeditiously as practicable but in no event later than five years." 42 U.S.C. § 7491(b)(2)(A), (g)(4). Congress thus unambiguously directed BART sources to reduce their pollution promptly, and it did not allow BART sources to delay pollution reductions until decades in the future. The Cholla BART "reassessment," however, would allow Units 3 and 4 to continue operating without any new pollution controls for more than seven years after the mandatory five-year compliance deadline.[24]

This statutory five-year deadline to install BART reflects a core purpose of the Clean Air Act's regional haze requirements. Congress distinguished BART sources from other sources and required BART sources to promptly reduce their pollution because Congress intended BART to pick the "low hanging fruit" of haze reductions. BART does this by requiring older, disproportionately-dirty sources to quickly install updated pollution controls. *See* 2005 Regional Haze Rule, 70 Fed. Reg. at 39,111. Accordingly, while Congress designed the overall regional haze program to eliminate human-caused visibility impairment over several decades, BART is a distinct requirement designed to secure immediate large-scale pollution reductions from the largest and dirtiest sources. *See* Final BART Rule, 77 Fed. Reg. at 72,534 ("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

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22 *See, e.g., id.* at 19, 23.

23 *See, e.g., id.*

24 EPA's brief defending its regional haze plan for Navajo Generating Station confirms the mandatory nature of the Clean Air Act's five-year BART compliance deadline. In that case, EPA has argued that if the agency issues a BART alternative under the Tribal Authority Rule, rather than a BART determination, it can set a compliance deadline longer than five years. Brief for Respondents at 25–28, *Yazzie v. EPA*, No. 14-73100 (9th Cir. May 29, 2015) (Ex. 8). But EPA's briefing makes clear that the five-year statutory deadline for BART does not provide this flexibility. As EPA stated, "It is not surprising . . . that EPA's previous BART determinations mandated five-year deadlines, because that is what the statute requires when *BART* is adopted by states." *Id.* at 28 (internal quotation marks and citations omitted).

first planning period ending in 2018."). The timing of these pollution reductions is critical, as the need to quickly curtail emissions from large and disproportionately-polluting BART sources was "a major concern motivating the adoption of the [Clean Air Act's] visibility provisions." 1999 Regional Haze Rule, 64 Fed. Reg. 35,714, 35,737 (July 1, 1999) (quoting H.R. Rep. No. 564, 95th Cong., 1st Sess. at 155 (1977)).

Contrary to ADEQ's claims, the BART "reassessment" weakens the existing BART determination by ignoring the Clean Air Act's timing requirements for BART. Under the BART "reassessment," national park and wilderness area visitors would suffer worse air quality and worse visibility conditions for nearly two decades longer than they will under the existing BART determination. ADEQ's conclusion that the BART "reassessment" does not weaken the existing BART determination because it will eventually outperform the existing plan decades in the future is unreasonable because it conflicts with Congress's intention that Cholla promptly reduce its pollution.

In addition, ADEQ's conclusion is unreasonable because the BART "reassessment's" purported long-term benefits rest on the assumption that after the utilities install SCR in 2017, Cholla's pollution would remain at those levels indefinitely. That assumption, however, is unfounded and is contrary to the regional haze program's purpose and structure. The regional haze program's goal is the elimination of all human-caused visibility impairment at Class I areas by 2064. 42 U.S.C. § 7491(a)(1); 40 C.F.R. § 51.308(d)(1)(i)(B), (d)(1)(ii). As discussed above, BART is a critically-important first step in reducing haze pollution from the largest and dirtiest sources. However, after a source installs BART controls it is not forever exempt from further pollution reductions under the regional haze program. Instead, in order to eliminate all human-caused visibility impairment by 2064, the haze program will necessarily require additional emission reductions from BART sources if they continue to operate decades after their initial BART determinations. Thus, ADEQ's reliance on the BART "reassessment's" long-term benefits is flawed because if Cholla was still operating under the existing BART determination when those benefits would finally materialize in the 2030s and beyond, the haze program would likely require Cholla to further reduce its pollution. Accordingly, ADEQ's justification for the BART "reassessment" is based on arbitrary assumptions and relies on long-term benefits that would likely be illusory.

In sum, when EPA issued the final BART determination for Cholla in December 2012, the Clean Air Act mandated that APS and PacifiCorp comply with the BART determination within five years. Two-and-a-half years have passed since the final BART determination, and the utilities would now prefer to comply with the regional haze program's BART requirements in a different, more flexible manner. While the Conservation Organizations strongly support APS's and PacifiCorp's commitment to stop burning coal at Cholla, the Clean Air Act's anti-backsliding provision places critical limits on the utilities' attempts to issue a new BART determination years after EPA finalized the existing BART determination. *See* 42 U.S.C. § 7410(*l*). ADEQ and EPA cannot now "re-do" or "reassess" the existing BART determination in a manner that results in more pollution and more visibility impairment. But ADEQ's analysis shows that this is exactly what would happen under the proposed BART "reassessment," as it would increase Cholla's cumulative NOx pollution and visibility impacts for nearly two decades after the BART compliance deadline. Moreover, ADEQ's attempts to justify the BART

"reassessment" based on long-term benefits that would not arise until decades after the BART deadline are unreasonable and contrary to the Clean Air Act's text and purpose. Because the BART "reassessment" would be a significant step backwards from the existing BART determination, section 110(*l*) prohibits EPA from approving the reassessment. Fortunately, as discussed below, APS and PacifiCorp can stop burning coal at Cholla Units 3 and 4 in 2025 while also complying with the haze program's BART requirements by installing updated, cost-effective pollution controls at both units by the December 2017 compliance deadline.

II. Updated Pollution Controls for Units 3 and 4 are Cost Effective and Should Be Selected as BART.

ADEQ's five-factor BART analysis for Cholla Units 3 and 4 rejected additional pollution controls as BART because ADEQ concluded that both SNCR and SCR controls would result in "excessive cost[s]" and moderate to insubstantial visibility improvements.[25] ADEQ's BART determination is unreasonable, as the record shows that installing SNCR and SCR at Units 3 and 4 is cost effective and would result in significant pollution reductions and visibility benefits. Accordingly, ADEQ should revise its BART "reassessment" to require Units 3 and 4 to install SCR or SNCR controls as BART by the December 5, 2017 compliance deadline.

A. At a minimum, SNCR is cost effective and should be BART.

Although ADEQ rejected SNCR controls as BART for Units 3 and 4, the agency's own BART analysis shows that installing and operating SNCR on the units before they stop burning coal in 2025 would be cost effective. Specifically, ADEQ's analysis shows that SNCR would reduce Unit 3's NOx pollution at an average cost-effectiveness of $3,177 per ton.[26] For Unit 4, SNCR would reduce the unit's NOx pollution at a cost of $3,027 per ton.[27] As ADEQ acknowledges, *EPA has already found these costs to be cost effective*.[28] EPA explicitly concluded in its BART determination for Cholla that NOx pollution controls that "have average cost-effectiveness values of $3,114/ton to $3,472/ton . . . fall[] in a range that we would consider cost-effective."[29] The record thus plainly shows that SNCR is in fact cost effective. ADEQ's conclusion that SNCR is not cost effective is arbitrary and unsupported by the record.

In addition, SNCR would be even more cost effective if ADEQ had used a proper remaining useful life in its cost analysis. ADEQ's cost analysis overestimated SNCR costs by assuming the controls would have a twenty-year remaining useful life, during which Units 3 and 4 would burn coal for eight years and then switch to gas for twelve years. However, operating SNCR on the units after a gas switch in 2025 would result in over twelve additional years of costs, but very minimal pollution reduction benefits due to the decrease in NOx emissions when

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25 ADEQ SIP Revision at 10.

26 *Id.* at 6, Table 3.

27 *Id.*

28 *Id.* at 5 ("EPA indicates in its Arizona Regional Haze [TSD] that an average cost-effectiveness of $3,000-4,000/ton falls within an acceptable range to be considered cost-effective.").

29 Proposed BART Rule, 77 Fed. Reg. at 42,860.

the units burn gas instead of coal. As ADEQ explained, because NOx pollution controls would minimally reduce the units' pollution after a gas switch, "once converted to natural gas, the use of SNCR or SCR controls would result in enormous costs per dv."[30] As a result, a proper cost analysis would have analyzed SNCR costs based on a 7.41 year remaining useful life, which would reflect the more realistic scenario that the utilities would install SNCR on Units 3 and 4 by December 2017, and then cease operating the SNCR when the units switch to gas in April 2025. ADEQ's approach artificially inflates SNCR's costs and makes SNCR appear less cost effective than it would be in reality. As illustrated in Table 1 below, had ADEQ used this more appropriate remaining useful life, it would have shown that SNCR would reduce Unit 3's NOx pollution at an average cost-effectiveness of $2,830 per ton, and Unit 4's NOx pollution at a cost of $3,015 per ton.

Table 1 – SNCR Average Cost-Effectiveness Using a 7.41 Year Remaining Useful Life

	SNCR	
	Cholla 3	Cholla 4
Total Capital Cost	$19,238,125	$24,885,052
Equipment Life	7.41	7.41
Interest Rate	0.07	0.07
CRF	0.18	0.18
First Year Debt Service	$3,416,077	$4,418,791
O&M	$1,254,500	$1,737,393
Total First Year Cost	$4,670,577	$6,156,184
NOx Tons Removed[31]	1,651	2,042
$/ton	**$ 2,830**	**$ 3,015**

30 ADEQ SIP Revision at 8.

31 ADEQ assumed that SNCR would be slightly more effective at removing NOx pollution than EPA's BART analysis assumed. *Compare* ADEQ SIP Revision at 42, Table B-2 & 48, Table B-8 (SNCR would remove 1,911 tpy of NOx at Unit 3 and 2,643 tpy of NOx at Unit 4 compared to OFA), *with* Final BART Rule, 77 Fed. Reg. at 72,548 (SNCR would remove 1,651 tpy of NOx at Unit 3 and 2,042 tpy of NOx at Unit 4 compared to OFA). Table 1 above reflects EPA's emission reduction estimates for SNCR, and thus produces a conservative estimate of SNCR's cost-effectiveness based on a 7.41 year remaining useful life. SNCR would be even more cost effective if ADEQ's greater emission reduction estimates and a 7.41 year remaining useful life are used. If ADEQ's estimates are used, SNCR would remove Unit 3's NOx pollution at a cost of $2,444 per ton and it would remove Unit 4's NOx pollution at a cost of $2,329 per ton.

It appears that ADEQ has attempted to obfuscate the fact that SNCR is cost effective by focusing attention elsewhere when it discusses BART costs. For example, while ADEQ's proposal specifically discusses SCR costs and SNCR's incremental cost-effectiveness, it only mentions SNCR's average cost-effectiveness once, buried within the data presented in Table 3.[32] In addition, ADEQ's conclusion that SNCR would entail "excessive" costs glosses over the fact that EPA had earlier determined that the costs required to install and operate SNCR would be cost effective at Cholla. Moreover, ADEQ weighed the BART factors based only on SNCR's incremental costs, even though EPA has specifically cautioned against doing so.[33] Because ADEQ apparently ignored SNCR's average cost-effectiveness when it concluded that SNCR's costs outweighed its visibility benefits, ADEQ's weighing of the BART factors is flawed and it should not have eliminated SNCR as BART.[34]

In addition, ADEQ's conclusion that SNCR would have insignificant visibility benefits is flawed because ADEQ only discussed SNCR's incremental visibility improvement. The record shows that installing SNCR at Units 3 and 4 would result in a 1.32 dv cumulative visibility improvement compared to existing controls, which is a significant visibility improvement.[35] But when ADEQ weighed the BART factors, it ignored this fact and only discussed SNCR's incremental visibility benefits.[36] Because of the multiple flaws in ADEQ's BART analysis, the BART "reassessment" is arbitrary. Consequently, at a minimum, ADEQ should revise its BART determination to select SNCR controls as BART for Units 3 and 4.

B. SCR is the "best available" control technology and should be BART.

While SNCR is undoubtedly cost effective and should be BART for Units 3 and 4 over the existing controls, ADEQ should select SCR as BART. EPA's regulations define BART as the "best system of continuous emission reduction," 40 C.F.R. § 51.301, and SCR is the best available control technology for the two Cholla units.

ADEQ rejected SCR as BART after concluding that its "excessive cost" outweighed the "moderate additional visibility improvements."[37] However, just as it did with SNCR, ADEQ only discussed the incremental cost-effectiveness of SCR when it weighed the BART factors. Focusing exclusively on SCR's incremental costs in this manner skewed ADEQ's weighing of the BART factors by overstating SCR's costs. ADEQ's analysis shows that SCR would reduce

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32 *See* ADEQ SIP Revision at 5 (only discussing SCR costs in the cost analysis summary); *id.* at 10 (only discussing the incremental cost-effectiveness of SNCR and SCR), *id.* at 6, Table 3.

33 In response to comments that SNCR's incremental costs at Apache Generating Station outweighed its incremental visibility benefits, EPA explained that a more comprehensive analysis that also considered average cost-effectiveness showed SNCR would be cost effective, and EPA "is not limited to considering incremental costs and benefits in comparing BART alternatives." Final BART Rule, 77 Fed. Reg. at 72,538.

34 *See* ADEQ SIP Revision at 10.

35 *See id.* at 8–9.

36 *See id.* at 10.

37 ADEQ SIP Revision at 10.

Unit 3's NOx pollution at a cost of $6,286 per ton, and it would reduce Unit 4's NOx pollution at a cost of $6,810 per ton.[38] These costs are cost effective in light of the technology's significant visibility benefits. As ADEQ's analysis shows, installing SCR at Units 3 and 4 would result in a 3.97 dv cumulative visibility improvement compared to existing controls, including a 0.79 dv improvement at Petrified Forest and a 0.59 dv improvement at the Grand Canyon.[39]

Moreover, SCR would be even more cost effective than ADEQ's analysis shows. Just as it did for SNCR, ADEQ's cost analysis for SCR used a twenty year remaining useful life. However, ADEQ should have used a 7.41 year remaining useful life because continuing to operate SCR after the units stop burning coal would result in twelve years of additional costs with very little pollution reduction benefits. *See supra* at 11–12. As illustrated in Table 2 below, had ADEQ used this more appropriate remaining useful life, it would have shown that SCR would reduce Unit 3's NOx pollution at an average cost-effectiveness of $5,022 per ton, and Unit 4's NOx pollution at a cost of $5,330 per ton.

Table 2 – SCR Average Cost-Effectiveness Using a 7.41 Year Remaining Useful Life

	SCR	
	Cholla 3	**Cholla 4**
Total Capital Cost	$83,461,195	$119,083,832
Equipment Life	7.41	7.41
Interest Rate	0.07	0.07
CRF	0.18	0.18
First Year Debt Service	$14,820,045	$21,145,489
O&M	$1,570,766	$2,350,182
Total First Year Cost	$16,390,811	$23,495,671
NOx Tons Removed	3,264	4,408
$/ton	**$ 5,022**	**$ 5,330**

As EPA has noted elsewhere, SCR controls are generally cost effective and should be BART if they provide a 0.5 dv or greater visibility improvement at the most impacted Class I area at a cost of $5,000 per ton or less. *See* Final Colorado Haze Plan, 80 Fed. Reg. 29,953, 29,957 (May 26, 2015) (while the 0.5 dv/$5,000 per ton thresholds "should not be used as absolute determinants of BART outcomes, they are in general consistent with the decisions that other states and EPA have made when considering whether to require SCR as NOx BART, and

38 ADEQ SIP Revision at 6.

39 *Id.* at 9.

generally reflect a reasonable balancing of the BART factors"). SCR at Cholla is thus cost effective according to EPA, as it would result in a visibility benefit significantly greater than 0.5 dv at the closest Class I area (0.79 dv improvement at Petrified Forest), at a cost that is only marginally above $5,000 per ton ($5,022 per ton at Unit 3 and $5,330 per ton at Unit 4). Because SCR would significantly reduce the units' NOx pollution and substantially improve visibility at many Class I areas, ADEQ should revise its BART determination to select SCR as BART.

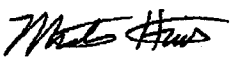
CONCLUSION

The Conservation Organizations strongly support APS's and PacifiCorp's retirement plan to stop burning coal at Cholla. However, the utilities' pledge to stop burning coal does not excuse Cholla from its obligations under the regional haze program. The BART requirements for Cholla have been in place for over two-and-a-half years, and the Clean Air Act does not allow the utilities or ADEQ to simply "re-do" or "reassess" the existing BART determination to implement the utilities' preferred course of action. As ADEQ's analysis shows, the proposed BART "reassessment" would subject national park and wilderness area visitors to increased pollution and worse visibility impairment for nearly two decades after the BART compliance deadline. Clean Air Act section 110(*l*) thus prohibits EPA from approving the BART "reassessment" because it would weaken the existing BART determination.

Fortunately, ADEQ's analysis points to a clear path forward that would allow the utilities to stop burning coal at Cholla on their preferred timeline, while also ensuring that the BART "reassessment" does not weaken the existing BART determination by allowing Units 3 and 4 to continue operating with any new pollution controls. As ADEQ's analysis demonstrates, installing updated pollution controls at Units 3 and 4 by the December 2017 BART deadline would cost-effectively reduce the units' NOx pollution before they stop burning coal in 2025. At a minimum, SNCR controls should be BART. Moreover, a proper analysis shows that SCR controls are the "best available" controls and should be BART. Accordingly, ADEQ should revise its BART determination to require Cholla Units 3 and 4 to install these cost-effective, updated pollution controls by the BART compliance deadline.

A strong haze plan for Arizona that complies with the Clean Air Act is critically important to improve visibility at the many national parks and wilderness areas in Arizona and nearby states. Moreover, a strong regional haze plan will protect public health and benefit tourism and local economies by ensuring that people from around the world will continue to travel to Arizona to explore and enjoy the region's treasured landscapes.

Sincerely,



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On behalf of National Parks Conservation Association and Sierra Club

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Submitted via email to: bv1@azdeq.gov

RE: Comments on the Draft Revision to the Arizona State Regional Haze State Implementation Plan and Significant Permit Revision No. 61713 to Air Quality Control Permit No. 53399 for Arizona Public Service Company for the Cholla Generating Station

Environmental Defense Fund ("EDF") and Western Resource Advocates ("WRA") respectfully submit the following comments on the Arizona Department of Environmental Quality's ("ADEQ") Draft Revision to the Arizona Regional Haze Plan for Arizona Public Service ("APS") and Draft Significant Permit Revision for the Cholla Generating Station ("Cholla").

Cholla is a major source of nitrogen oxides ("NO_X"), sulfur dioxide ("SO_2"), and particulate matter ("PM")—pollutants which have significant adverse impacts on protected scenic vistas and human health. Cholla is located within 300 kilometers of thirteen Class 1 Areas, including Grand Canyon, Petrified Forest, Capitol Reef, and Mesa Verde National Parks, and has significant visibility and environmental impacts on these treasured areas. Cholla is also a major source of climate-disturbing carbon dioxide pollution and toxic mercury emissions, and a significant contributor to the formation of health-harming ozone and fine particulate pollution.

APS's proposed BART Reassessment will enable significant public health and environmental benefits, including very significant near-term and ongoing reductions in climate-disturbing pollution, toxic mercury, and particulate matter, and a long-term decrease in haze and ozone pollution. The APS BART Proposal will, however, result in higher NO_X emissions and concomitant visibility impacts from 2018 until 2025 than under EPA's December 5, 2012 Federal Implementation Plan for Cholla ("EPA FIP") and, thus, we strongly urge APS and the State to examine whether the additional visibility impacts under the APS BART Proposal may be mitigated through a lower continuous SO_2 emissions limit or through other protections.

1. Overview of the APS BART Proposal

ADEQ is proposing to revise the Arizona Regional Haze SIP and Air Quality Control Permit for Arizona Public Service Company pertaining to the Cholla Generating Station in Navajo County, Arizona (the "Draft SIP Revision"). ADEQ undertook this proposed revision in response to a proposal by APS to reassess the best available retrofit technology ("BART") requirements for Cholla in light of a proposed transition away from coal at Cholla Unit 2 in 2016 and at the remaining units by 2025 (the "APS BART Proposal"). The Draft SIP Revision requires APS to shut down the coal-fired Unit 2 by April 2016, and to discontinue burning coal

in Units 1, 3, and 4 by April 2025. The Draft SIP Revision would replace the existing Cholla Arizona regional haze SIP for PM and SO_2 and the EPA FIP for NO_X. The modeling that APS submitted to ADEQ in support of the APS BART Proposal showed that the EPA FIP will achieve greater visibility improvements than the APS BART Proposal after 2017 and until 2025, due primarily to the installation of selective catalytic reduction ("SCR") NO_X controls under the EPA FIP. After the cessation of coal burning at all units in 2025, the APS BART Proposal will result in greater visibility improvements compared with the EPA FIP.

2. Description of Other Similar Multi-Pollutant BART Approaches in the Southwest

In August 2012, EPA accepted APS's proposed alternative and required Four Corners Power Plant ("FCPP") to reduce emissions of NO_X and PM. To reduce NO_X emissions, the EPA required that FCPP either 1) meet a plant-wide emission limit of 0.11 lb/MMBtu on a rolling 30-day average that would reduce NO_X emission rates, or 2) implement alternative emissions controls strategy that would retire Units 1–3 and install selective catalytic reduction ("SCR") controls on Units 4 and 5 that would reduce NO_X emissions rates by 87 percent.[1] During the public comment period, EDF supported the APS BART alternative because although the BART alternative allowed for greater NO_X emissions for the years 2016–2018 (EDF suggested tighter NO_X controls), the BART alternative achieved greater reductions earlier and more rigorous reductions from 2019 and beyond.[2] Additionally, EDF noted the significant adverse health effects FCPP had on the area as the largest source of NO_X emissions in the United States, and that the NO_X emissions also contributed to deposition of nitrogen in ecosystems.[3]

In October 2014, EPA approved a BART alternative for the San Juan Generating Station that required the station to install selective non-catalytic reduction on units 1 and 4, retire units 2 and 3 by 2017, and commence a program to determine if additional NO_X emission reductions can be achieved. EPA stated it was accepting the alternative because "the revisions were adopted and submitted in accordance with the CAA and EPA's regulations regarding the regional haze program and meet the CAA provisions concerning non-interference with programs to protect visibility in other states."[4] EPA's BART approaches for Four Corners and San Juan were consistent with EPA's findings in the Regional Haze Rule that "emissions contributing to health effects and those contributing to visibility impairment are generally the same"[5] and that "[v]isibility degradation has also been recognized as an indicator of multiple human-health effects and environmental effects resulting from air pollution all over the world."[6]

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[1] 78 Fed. Reg. 60,700, 60,700–701 (Oct. 2, 2013).
[2] *See* Environmental Defense Fund, *Comments on EPA's Source Specific Federal Implementation Plan for Implementing Best Available Retrofit Technology and BART Alternative for Four Corners Power Plant* (May 2, 2011).
[3] *Id.*
[4] 79 Fed. Reg. 60,978, 60,985 (Oct. 9, 2014).
[5] 64 Fed. Reg. 35,714, 35,255 (July 1, 1999).
[6] *Id.* at 35,718; *see also* Approval of Air Quality Implementation Plans; Navajo Nation; Regional Haze Requirements for Navajo Generating Station ["NGS"], 79 Fed. Reg. 46,514 (Aug. 8, 2014) (included an alternative operating scenario that required the closure of one unit at NGS (or the curtailment of electricity generation by a similar amount) in 2019, and compliance with a NO_X emission limit that is achievable with the installation of SCR on two units in 2030).

3. Comparison of NO_X Emissions and Visibility Impacts Under the EPA FIP vs. the APS BART Proposal

On December 5, 2012, EPA published a final NO_X BART FIP for Cholla that imposed an average NO_X emission limit of 0.055 lb/MMBtu for Units 2, 3, and 4 (the "BART Units") calculated over a rolling 30-day period.[7] To meet this requirement, the FIP required the installation and operation of SCR emission controls on the BART Units by December 5, 2017.[8] Rather than installing SCR on the BART Units to comply with Cholla's Regional Haze obligations, the APS BART Proposal relies on: the permanent shut-down of Unit 2 by April 1, 2016; the continued operation of the currently-installed low-NO_X burners ("LNB") and separated over-fired air ("SOFA") on Units 3 and 4; and the cessation of coal combustion at Units 3 and 4 by April 30, 2025 with an option to convert to natural gas combustion at those units by July 31, 2025 with a $\leq$ 20 percent annual average capacity factor.[9] Until Units 3 and 4 transition away from coal in 2025, the APS BART Proposal imposes a NO_X emission limit of 0.22 lb/MMBtu; if Units 3 and 4 convert to natural gas in 2025, the APS BART Proposal imposes a post-conversion NO_X emission limit of 0.08 lb/MMBtu.[10]

As described in the Proposed SIP Revision, due to the shutdown of Unit 2 in 2016, the APS BART Proposal will result in lower NO_X emissions in 2016 and 2017 as compared to the EPA FIP.[11] However, due to the use of LNB and SOFA rather than SCR for NO_X control on Units 3 and 4 until they cease coal combustion in 2025, the APS BART Proposal will result in 4,161 tons per year more NO_X emissions than under the EPA FIP from 2018 to 2025.[12] After 2025, the natural gas conversion at Units 3 and 4 and the capacity factor limits under the APS BART Proposal will result in greater annual NO_X reductions than the EPA FIP.[13] Overall, the APS BART Proposal will lead to lower NO_X emissions over the entire period from 2016 to 2046, but will result in higher NO_X emissions from 2018 to 2025.[14] Figure 3 of the Draft SIP Revision shows cumulative NO_X emissions under the APS BART Proposal from 2016–2046.

[7] 77 Fed. Reg. 72,511, 72,514 (Dec. 5, 2012).
[8] *Id.* at 72,515.
[9] Draft SIP Revision at 2–3.
[10] *Id.* at 4, Table 1.
[11] *Id.* at 19.
[12] *Id.*
[13] *Id.*
[14] *Id.*

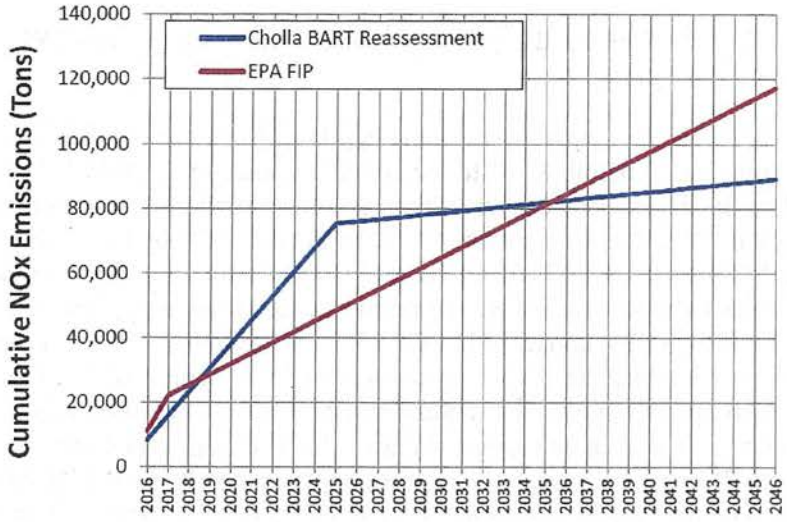

Figure 3 Cumulative NOx Emissions Associated with EPA's FIP vs. Cholla BART Reassessment over 2016-2046

As shown in Figure 5 of the Draft SIP Revision, higher NO_X emissions from 2018–2025 under the APS BART Proposal will result in higher visibility impacts at affected Class I areas than under the EPA FIP.

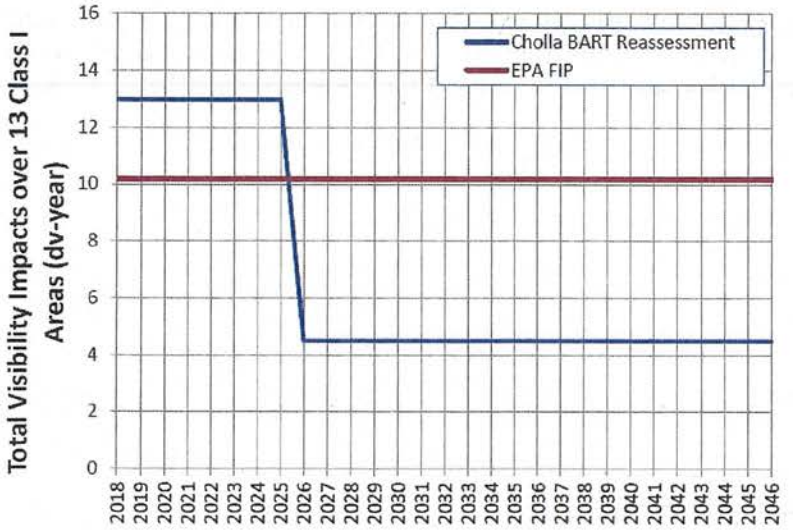

Figure 5 Comparison of Total Visibility Impacts over Thirteen Class I Areas Associated with EPA FIP vs. Cholla BART Reassessment

4. Evaluation of the Multi-Pollutant Aspects of the APS BART Proposal

Whereas the APS BART Proposal will lead to increased NO_X emissions in 2018–2025 as compared to the EPA FIP, the transition from coal at Unit 2 (in 2016) and Units 1, 3, and 4 (in 2025) under the APS BART Proposal will significantly reduce cumulative emissions of other air pollutants—sulfur dioxide, particulate matter, mercury, and carbon dioxide—over the entire 2016–2046 period as compared to the applicable Arizona SIP. Moreover, the closure of Unit 2 in 2016 will provide some initial benefits in reducing ozone-forming NO_X emissions, while the 2025 transition from coal at Units 1, 3, and 4 will provide long-term ozone benefits.

a. Sulfur Dioxide ("SO_2")

Sulfur dioxide has been linked to a number of adverse health impacts. Short-term exposure to SO_2 can increase respiratory morbidity, particularly amongst children and people with asthma.[15] Further, studies have found positive associations between ambient SO_2 concentrations and "respiratory symptoms in children, as well as emergency department visits and hospitalizations for all respiratory causes and asthma across multiple age groups."[16] The immediate effect of SO_2 exposure on the respiratory system is bronchoconstriction, which causes rapid shallow breathing.[17] People afflicted by asthma are particularly at-risk for adverse effects of SO_2 exposure, and decreasing lung function is associated with increasing SO2 concentrations.[18]

In the atmosphere, SO_2 emissions combine with ammonia gas, in the presence of oxidants and ultraviolet light, to form ammonium microscopic sulfate particles. These particles then absorb water vapor and grow to a size that is extremely efficient at scattering sunlight and impairing visibility. While this atmospheric reaction and consequent particle formation also occurs with emissions of NO_X, the thermodynamic reaction rates generally prefer the formation of ammonium sulfate to ammonium nitrate.[19] Therefore, reducing a ton of SO_2 emissions will generally result in greater visibility improvements than reducing a ton of NO_X emissions.

Overall, the APS BART Proposal will decrease SO_2 emissions by about 170,000 tons by 2046 as compared with the applicable 2011 Arizona SIP.[20] Figure 2 of the Draft SIP Revision compares the cumulative SO_2 emissions under the 2011 Arizona SIP and the APS BART Proposal. Reducing SO_2 emissions under the APS BART Proposal would decrease local short-term exposure to SO_2 and associated health effects, particularly among at-risk populations, such as individuals with asthma. The SO_2 reductions at Cholla, both in the interim and upon the cessation of coal burning, should also result in substantial visibility improvements in the region.

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[15] 75 Fed. Reg. 35,520, 35,525 (June 22, 2010).
[16] *Id.*
[17] *Id.* at 35,525-26.
[18] *Id.* at 35,525.
[19] Seinfeld and Pandis, "Atmospheric Chemistry and Physics: From Air Pollution to Climate Change," 2nd Ed., 2006.
[20] Draft SIP Revision at 16.

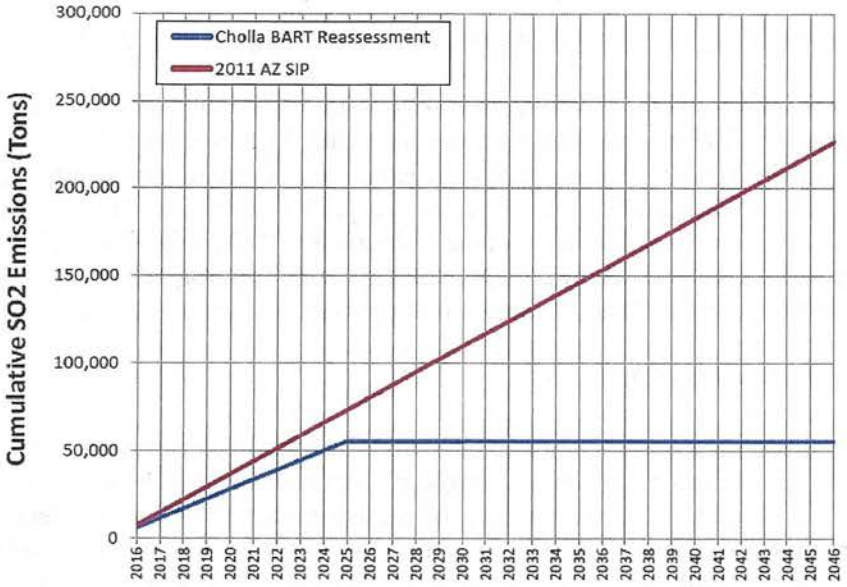

Figure 2 Cumulative SO_2 Emissions Associated with 2011 AZ SIP vs. Cholla BART Reassessment over 2016-2046

b. Coarse Particulate Matter ("PM_{10}")

The coarse and fine constituents of particulate matter ranging in size from $PM_{2.5}$ to PM_{10} are linked to a number of adverse health impacts because "these particles are capable of reaching the most sensitive areas of the lung, including the trachea, bronchi, and deep lungs."[21] There are positive associations between short-term particulate exposure and mortality, cardiovascular effects, and respiratory effects, including increased hospital admissions and emergency department visits.[22]

Overall, the APS BART Proposal will decrease PM_{10} emissions by about 15,000 tons by 2046 as compared with the applicable 2011 Arizona SIP.[23] Figure 1 of the Draft SIP Revision compares the cumulative PM_{10} emissions under the 2011 Arizona SIP and the APS BART Proposal.

[21] 78 Fed. Reg. 3086, 3164 (Jan. 15, 2013).
[22] *Id.* at 3167.
[23] Draft SIP Revision at 16.

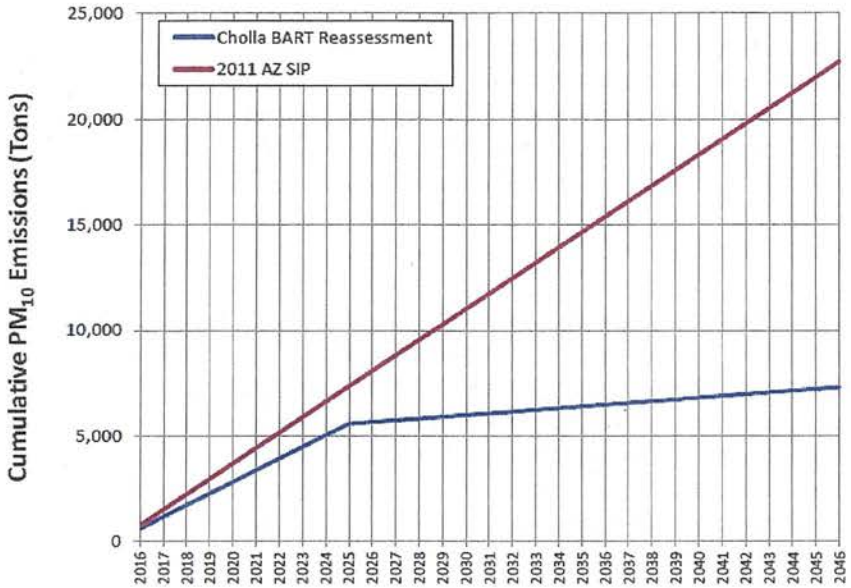

Figure 1 Cumulative PM_{10} Emissions Associated with 2011 AZ SIP vs. Cholla BART Reassessment over 2016-2046

c. Fine Particulate Matter ("$PM_{2.5}$")

Long- and short-term exposure to fine particulate matter can cause a variety of serious health effects, including premature mortality and cardiovascular impacts.[24] Long-term exposure to $PM_{2.5}$ has been also been associated with an array of cardiovascular and respiratory effects, developmental and reproductive effects, and carcinogenic, mutagenic and genotoxic effects.[25] Such cardiovascular effects include: heart attacks, congestive heart failure, stroke, and mortality.[26] Respiratory effects can include: decreased lung function growth, increased respiratory symptoms, and asthma development.[27] Long-term exposure to fine particulates has also been associated with increased lung cancer mortality.[28]

Short-term exposure to fine particulates also is associated with adverse cardiovascular and respiratory effects. Cardiovascular impacts range from "subtle changes in indicators of cardiovascular health to serious clinical events, such as increased hospitalizations and emergency department visits."[29] Respiratory effects include increased respiratory-related emergency department visits and hospital admissions for chronic obstructive pulmonary disease ("COPD") and respiratory infections.[30]

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[24] 78 Fed. Reg. at 3103.
[25] *Id.*
[26] *Id.*
[27] *Id.* at 3103–04.
[28] 77 Fed. Reg. 38,890, 38,908 (June 29, 2012).
[29] 78 Fed. Reg. at 3103.
[30] *Id.* at 3103–04.

Precursors to fine particulate matter include SO_2 and NO_X.[31] While NO_X emissions under the APS BART Proposal will increase from 2018–2025, SO_2 emissions will be much lower than under the 2011 Arizona SIP during the same time period. This relative decrease in SO_2 emissions should mitigate to some extent the impact of additional NO_X emissions on ambient fine particulate concentrations and the associated health impacts.

d. Carbon Dioxide ("CO_2")

The Cholla Power Plant emits over 7 million metric tons of CO_2 per year.[32] Carbon dioxide emissions contribute significantly to climate change.[33] The stakes are high in Arizona as hotter temperatures, reduced winter snowpacks, and more frequent droughts are expected to decrease Colorado River streamflows.[34] These changes are projected to result in decreased surface water supplies, which will impact the allocation of water resources to major uses, such as agriculture, drinking water, and ecosystem flows.[35] Increased warming, drought, and insect outbreaks have increased wildfires and impacts to people and ecosystems throughout the West.[36] Moreover, projected temperature increases will increase the threats and costs to public health in our region's cities.[37] For example, heat stress, a recurrent health problem for urban residents, has been the leading weather-related cause of death in the United States since 1986, when record keeping began; the highest rates of heat stress nationally are found in Arizona.[38]

Due to the closure of Unit 2, the APS BART Proposal would decrease CO_2e emissions at Cholla by approximately 1.85 million metric tons per year from 2016 through 2024. If generation switches from coal to natural gas in mid-2025, then 2025 emissions would be reduced by approximately 5.26 million metric tons from the 2001 to 2013 average.[39] For years 2026 and beyond if generation continues with natural gas limited to 20 percent of the year, then total CO_2e emissions from fuel combustion would be approximately 713,000 metric tons per year, a reduction of approximately 90 percent from current annual emissions.[40]

e. Mercury

Cholla is a significant source of mercury emissions. Cholla released 340 pounds of gaseous mercury compounds into the atmosphere in 2013.[41] Mercury is a toxic heavy metal that

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[31] *Id.* at 3253.
[32] EPA Greenhouse Gas Reporting Program Data, 2013.
[33] IPCC, 2014: *Climate Change 2014: Mitigation of Climate Change*, Fifth Assessment Report of the Intergovernmental Panel on Climate Change.
[34] 2014 National Climate Assessment, U.S. Global Change Research Program, *available at* http://nca2014.globalchange.gov/report/regions/southwest.
[35] *Id.*
[36] *Id.*
[37] *Id.*
[38] *Id.*
[39] NPC North American Resource Study, Paper #4-2, *Life-Cycle Emissions of Natural Gas and Coal in the Power Sector*, September 15, 2011, Table 7 (CO_2 emissions rates of natural gas vs. coal); EPA Air Market Program Data, *available at* http://ampd.epa.gov/ampd/ (average unit heat input from 2001 to 2013).
[40] *Id.*
[41] EPA Toxic Release Inventory, Form R Report, 2013, *available at* http://www.epa/gov/triexplorer.

contaminates water bodies, threatens the development of newborns and children, and contributes to the risk of heart disease.[42] Once mercury has deposited into ecosystems, it can be transformed to methylmercury, a compound that can readily accumulate to very toxic levels in organisms. Exposure to methylmercury can damage the brain, heart, kidneys, lungs, and immune system of people of all ages. Newborn babies and young children are particularly vulnerable as high levels of methylmercury can harm their developing nervous systems, resulting in later difficulties with thinking and learning.[43]

Fish consumption advisories are in effect in almost every U.S. State because of mercury contamination. Advisories generally apply to larger and older fish that have, over time, accumulated high levels of methylmercury. Humans are warned to limit their consumption of such fish. Mercury bioaccumulation was perceived for some years as primarily an eastern U.S. concern because of higher levels of deposition and an abundance of aquatic and wetland systems in the East. More recently, mercury bioaccumulation has been recognized as a growing concern in the West. A study of fish from streams and rivers in the western U.S. found that trout, salmon, and other fish-eating fish had levels of mercury exceeding the level considered protective for fish-eating mammals in significant portions of the streams assessed.[44]

Cholla Unit 2 has very inefficient mercury control systems, with 30% average removal rate compared with approximately 89% for Units 1, 3, and 4.[45] Using these removal efficiencies to prorate the 340 pounds of annual plant-wide emissions, Unit 2 emissions in 2013 would be approximately 225 pounds. Therefore, Unit 2's closure in 2016 under the APS BART Proposal reduces the total air emissions of mercury by 66 percent.

If the remaining Cholla units transition to natural gas generation in 2025 rather than shut-down, then mercury emissions would be approximately 99 percent less than current emissions.[46] Ongoing emissions from 2025 onwards would be approximately 3 pounds per year, which would represent a very significant reduction from current mercury emission levels.

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[42] *See, e.g.*, Leonardo Trasande, Philip J. Landrigan, and Clyde Schechter, *Public Health and Economic Consequences of Methyl Mercury Toxicity to the Developing Brain*, Environmental Health Perspectives, Vol. 113, No. 5 (May 2005); Kathryn Mahaffey, Ph.D., EPA, *Methylmercury: Epidemiology Update* (Fish Forum 2004); EPA, Methylmercury Exposure at www.epa.gov/mercury/exposure.htm; National Academy of Sciences' National Research Council, *Toxicological Effects of Methylmercury* (2000); Castoldi, Coccini, Ceccatelli, and Manzo, Neurotoxicity and molecular effects of methylmercury, Brain Res. Bull., 55:197–203 (2001); Alan Stern, "A review of the studies of the cardiovascular health effects of methylmercury with consideration of their suitability for risk assessment," Environmental Research, Vol. 98, Issue 1 (May 2005) 133–42; Gerald J. Keeler, Matthew S. Landis, Gary A. Norris, Emily M. Christianson, and J. Timothy Dvonch, *Sources of Mercury Wet Deposition in Eastern Ohio*, USA, Environ. Sci. Technol., Article 10.1021/es060377q S0013-936X(06)00377-4 (published on web Sept. 8, 2006).

[43] *See* Environmental Defense Fund, *Mercury Alert: Cleaning up Coal Plants for Healthier Lives*, (2011), http://www.edf.org/documents/11661_mercury-alert-cleaning-up-coal-plants.pdf.

[44] Spencer A. Peterson, *et al.*, *Mercury Concentration in Fish from Streams and Rivers Throughout the Western United States*, 41 Env't Sci. & Tech. 58 (2007).

[45] ADEQ Technical Support Document for permit No. 53399, May 31, 2012.

[46] NPC North American Resource Study, Paper #4-2, *Life-Cycle Emissions of Natural Gas and Coal in the Power Sector*, September 15, 2011, Figure 7.

f. Ozone

Exposure to ozone is associated with a broad range of adverse respiratory and cardiovascular effects, and increased mortality. Short-term exposure can cause respiratory and central nervous system effects, while long-term exposure has cardiovascular, reproductive and developmental, central nervous system, and total mortality effects.[47]

Navajo County and its surrounding counties are currently in attainment of the 8-hour ozone national ambient air quality standard ("NAAQS") of 75 parts per billion ("ppb"). EPA is, however, considering a new health-based 8-hour ozone NAAQS in the range of 60–70 ppb[48], and the most recent design values for Navajo, Coconino, and Gila Counties show ozone levels at the upper end or above that range.[49] EPA is under a federal court order to finalize its ozone determination by October 1, 2015.[50] In the event that additional NO_X reductions are required to attain or maintain the applicable ozone NAAQS in Northern Arizona, then the near- and long-term NO_X reductions achieved by the APS BART Proposal will help make progress towards restoring and maintaining healthy air.

5. Importance of Transition from Coal-Fired Power Generation

The APS BART Proposal is one of many in the region that undertake a transition from coal-fired electric generation. EDF and WRA have supported the steady, transformative transition of old, high-emitting coal-fired generation to cleaner and renewable sources of generation with associated economic benefits, such as the Technical Working Group plan for Navajo Generating Station. Other efforts include reducing reliance of coal at San Juan Generating Station and Four Corners Power Plant as described above. As these coal-fired power plants reduce generation there will be large shifts in local economies with Tribal economies seeing the bulk of the changes. The transition from coal-fired power generation could provide opportunities for economic development through renewable energy development that utilizes the existing electrical transmission capacity in the region. In addition, the proposed shut down of Cholla Unit 2 should result in reducing the water needs at the power plant. The region surrounding Cholla faces many water supply and quality challenges. We strongly recommend that this BART Proposal be carried out in a way that will decrease demand on scarce water resources and address any remaining water quality issues to protect the health and welfare of the communities near the plant.

Overall, the APS BART Proposal could have positive long-term effects on the region's communities by reducing and removing emissions that have long-term adverse effects on the health and welfare of those communities.

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[47] 79 Fed. Reg. 75,234, 75,247 (Dec. 17, 2014).
[48] *Id.* at 75,240.
[49] EPA 2013 Ozone Design Value Report, Table 4, *available at* http://epa.gov/airtrends/values.html (showing 2011–2013 design values of: 75 ppb in Gila; 72 ppb in Coconino; and 70 ppb in Navajo).
[50] 79 Fed. Reg. at 75,236.

6. Key Recommendations

EDF and WRA support the new BART proposal submitted by APS with the following key recommendations. EDF and WRA recommend that the State and APS adopt changes to the proposed permitted emissions for units 1, 3, and 4 that would provide cost-effective protection of visibility in the interim period between shut down of Unit 2 and ceasing coal burning in Units 1, 3, and 4. The proposed continuous emissions permit levels for SO_2 in the State notice and used in the BART air quality modeling do not reflect recent operating levels for sulfur dioxide.[51] We recommend the State and APS reduce the permitted continuous emissions levels so that air quality modeling reflects the improvement to visibility that is currently achieved under the existing removal efficiency requirement. We understand this does constrain future plant operations if the sulfur content of the coal supply increases, but the relatively short remaining duration of coal operations should help mitigate that risk. We urge the State and APS to examine the extent to which a lower continuous SO_2 emissions limit would secure visibility protection consistent with or better than EPA's BART FIP while preserving the critical multi-pollutant benefits of a broader transition from coal in the APS BART Proposal.

Furthermore, EDF and WRA encourage the State and APS to take steps to assure a positive economic and environmental transition for the region. Support could take the form of cooperative efforts to utilize transmission, land, and other infrastructure assets to bring renewable energy projects online. This may include mutually-beneficial partnerships with Tribes, federal agencies, and local communities to develop renewable power projects as Tribes broaden their energy development efforts.

Since there will be changes in transmission usage in the region near Cholla, it would be appropriate for APS to reevaluate transmission and generation issues in supply to tribal lands as part of the transition at Cholla. It may be possible to increase the reliability and affordability of electricity for local communities and businesses through the use of existing assets combined with modest investments in new resources.

In addition, local and tribal economies could benefit from emphasis on preferring tribal contractors and labor for decommissioning projects and ongoing transition issues such as aquifer monitoring and any necessary remediation.

[51] *See* Draft Technical Support Document, Air Quality Significant Permit Revision No. 61713 To Operating Permit No. 53399 APS – Cholla Generating Station, Pg. 2 (June 4, 2015); Cholla BART Reassessment, Application for Significant Permit Revision and Regional Haze State Plan Revision – Cholla Generating Station, Pg. 86 (March 12, 2015).

Thank you for your careful consideration of these comments.

Respectfully submitted,

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On behalf of Western Resource Advocates

Arizona Public Service Company (APS) appreciates the opportunity to provide comments in support of the Arizona Department of Environmental Quality's (ADEQ) proposed revision to the State Regional Haze Implementation Plan and the Significant Permit Revision for the Cholla Power Plant (Cholla) Air Quality Control Permit. APS owns Cholla Units 1, 2, and 3 and is the operating agent for Unit 4, which is wholly owned by PacifiCorp. APS has an ongoing and essential duty to our customers, employees, and the communities we serve to ensure that we operate Cholla in a manner that balances the ability to provide reliable and affordable energy with meeting increasingly stringent environmental regulations. Because the actions being proposed by ADEQ deliver this balance in the most logical and sensible manner, APS supports these actions.

On February 28 2011, ADEQ submitted its Regional Haze State Implementation Plan (SIP) to the U.S. Environmental Protection Agency (EPA). In the proposed Arizona SIP, ADEQ determined that the dry, low-NOx burners, which dramatically reduce nitrogen oxide emissions and had already been installed on the Cholla units, met the best available retrofit technology (BART) requirements of the regional haze regulations. On July 20, 2012, EPA proposed to partially approve and partially disapprove the Arizona SIP and issued a proposed Federal Implementation Plan (FIP). EPA proposed to approve the BART requirements for sulfur dioxide and particulate matter emission limits contained in the Arizona SIP, but disapprove the state's proposed BART determination for nitrogen oxides. EPA determined that dry, low-NOx burners did not constituent BART at the Cholla power plant and that the installation and operation of expensive selective catalytic reduction (SCR) technology was required.

APS disagreed with EPA's determination that SCRs were necessary to meet the BART requirements. On September 18, 2012, APS submitted extensive comments and supporting documents regarding EPA's proposed BART FIP. APS questioned EPA's legal authority to overrule the state's BART determination and identified numerous areas where we believe EPA

erred in its analysis, including EPA's cost-effectiveness analysis and visibility modeling. Furthermore, APS stated in its comments that requiring the installation of SCRs at Cholla would significantly challenge the economic viability of the plant. Notwithstanding these comments, EPA finalized its Arizona BART FIP on December 5, 2012 and required the installation and operation of SCR by the end of 2017 to meet BART requirements. In addition, EPA added a new removal efficiency requirement for sulfur dioxide that had not been previously proposed.

In response to the EPA's action, and in conjunction with PacifiCorp, APS conducted a BART reassessment to develop a more reasonable approach than what is currently required by the EPA BART FIP. The BART reassessment resulted in the actions that are being proposed in the revised State Regional Haze SIP and the Cholla Air Quality Control Permit. We decided to take these actions only after a careful evaluation of all the potential options to comply with the regional haze rule.

APS's BART reassessment will result in increased visibility improvement over the current BART requirements for NOx imposed on Cholla Units 2, 3, and 4 under the FIP. Where the FIP contemplates the Cholla BART units will use coal as fuel until at least 2037, the BART reassessment calls for Unit 2 to shut down permanently in less than a year, and Units 3 and 4 to cease burning coal in less than 10 years. In addition, while Unit 1 is not BART-eligible and, thus, not subject to the FIP, the use of coal at the unit also will end by April 2025. As evidenced by the BART reassessment modeling, the visibility benefits resulting from these proposed actions will exceed those available under the FIP. Moreover, the BART reassessment achieves all of this in a much more cost-effective manner for customers, while allowing APS and its customers sufficient time to recoup the significant emission control investments already made in the units.

In closing, I would like to summarize three important points related to the proposed actions. First, the BART reassessment allows Cholla to continue to operate in an economical fashion for a longer period than what would occur under the current EPA FIP, and it establishes the ability to convert the units to natural gas at a future date if it is determined that doing so makes economic sense. Second, it ensures the continued operation of Cholla for an additional seven years beyond the BART compliance date, thereby extending the life of an economic asset

and preserving an important source of tax revenue and economic activity for the local community. Third, the BART reassessment will result in a greater long-term environmental benefit than what would be obtained under the EPA FIP.

APS appreciates the considerable effort that ADEQ has put forth in developing the BART reassessment proposal and the outreach by ADEQ to assure it develops the best possible outcome. Once again, APS appreciates the opportunity to provide comments.

Ed Seal
Cholla Plant Manager

NAVAJO COUNTY

Board of Supervisors

Robert K. Black Jr. • Jesse Thompson •Jason E. Whiting • Steve Williams • Dawnafe Whitesinger

"We are Navajo County"

July 13, 2015

Balaji Vaidyanathan
Air Quality Permits Section Manager
ADEQ

On behalf of the Navajo County Board of Supervisors, I would like to submit this letter of support for Arizona Public Service's Proposed Alternative and Application to Revise Air Quality Control Permit no. 53399 for the Cholla Generation Station. We also offer our support for the State's proposed revision to the State Implementation Plan and strongly encourage the Arizona Department of Environmental Quality to approve both actions.

It is important to note that the Cholla Generating Station produces more than 1,000 megawatts of electricity for the State and is a vital part of our regional economy with nearly 250 workers and an annual payroll of more than $29 million. Additionally, Cholla provides more than $30 million in economic activity each year and more than $15 million in state, local, and federal taxes each year which makes it a very large contributor to our tax base for services such as education, law enforcement, public safety and other essential services.

We recognize that Cholla's continued operation is threatened by the U.S. Environmental Protection Agency's (EPA) Regional Haze Program which is aimed at reducing emissions of nitrogen oxygen (NOx) and other pollutants in Class 1 federal areas. We know that the State of Arizona submitted a State Implementation Plan (SIP) for regional haze in 2011 that recognized the significant efforts that had already been made to reduce NOx emissions but the EPA rejected that plan and submitted a Federal Implementation Plan that requires Arizona utilities to install selective catalytic reduction technology (SCR). It is our understanding that the results of that Federal Implementation Plan would provide less than one deciview of improvement which is imperceptible to the naked eye and could cost Arizona utilities and rate payers more than $1 billion including $350 million to the Cholla Plant. The cost of complying with EPA's requirement is uneconomical and would result in the closure of APS' units at that plant.

Based on the consequences of the EPA Plan, APS has put forward an alternative that would close unit #2 in 2016 and eliminate the use of coal by 2025 thereby providing a very vital economic asset to the region for the next 10 years and removing the unnecessary and burdensome costs of $350 million to ratepayers.

Therefore, the Navajo County Board of Supervisors offers their full support of the APS request to revise Air Quality Permit No, 53399 and the revised State Implementation Plan and strongly encourages ADEQ to approve both actions as a viable and necessary alternative to the EPA Federal Implementation Plan.

Thank you for your consideration in this matter,

Jason Whiting, District III
Navajo County Board of Supervisors

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• www.navajocountyaz.gov •

Statement of Kevin Dahl, Arizona Senior Program Manager of National Parks Conservation Association, regarding the Arizona Department of Environmental Quality's proposed Best Available Retrofit Technology "reassessment" for Cholla Power Plant, Phoenix, July 14, 2015

Thank for this opportunity to speak today. I am Kevin Dahl, the Arizona Senior Program Manager for National Parks Conservation Association (NPCA). Since 1919, this nonpartisan and nonprofit organization has been the leading voice in safeguarding our national parks. NPCA and its one million supporters work to protect and preserve our nation's natural, historical, and cultural heritage for future generations.

NPCA and Sierra Club have jointly submitted detailed comments today via our counsel Earthjustice, so my brief comments today are to just offer a few highlights.

First off, bravo to Arizona Public Service Company and PacfiCorp for making plans to end using coal at the aging Cholla Power Plant. Cholla is the nation's worst park polluter, and it also impacts communities throughout northern Arizona. Closing one unit next year, and either closing two more in 2025 (or converting to cleaner natural gas), is an admirable thing to do.

But it is disappointing to see this proposal for the state to take a step backwards. This plant must do more to comply with the Clean Air Act – and do right by this region – in the interim period before closure or conversion.

Our nation set a goal back in the 1970s to clean up the air at our most treasured landscapes, the national parks, knowing that doing so would also stop the health of air pollution. Cholla should install additional pollution controls that are economical and have been required at most other coal-fired plants in the nation. Allowing more time for the plant to continue to harm Arizona's residents and visitors is unacceptable.

Finally, another thank you to the utilities for reaching out to NPCA and other groups to discuss this issue during the last few months. While we were not able to find a solution at this time that we could all accept, it was a good effort which we truly appreciate.

Thank you.

Appendix F.6

Responsiveness Summary

ARIZONA PUBLIC SERVICE COMPANY
CHOLLA GENERATING STATION
SIGNIFICANT PERMIT REVISION NO. 61713
RESPONSIVENESS SUMMARY TO PUBLIC COMMENTS

INTRODUCTION

The Arizona Department of Environmental Quality (ADEQ) has proposed two actions through this process: a revision to the Arizona State Regional Haze State Implementation Plan (SIP) and Significant Permit Revision No. 61713 to Air Quality Control Permit No. 53399 for Arizona Public Service Company (APS) for the Cholla Generating Station located at 4801 Frontage Road, Joseph City, Navajo County, Arizona 86032. The significant revision to the permit is intended as a component of the SIP revision to assist in satisfying the Arizona Regional Haze Best Available Retrofit Technology (BART) requirements. The SIP and permit revision will become effective following the U.S. Environmental Protection Agency (EPA)'s approval and final action rescinding the current Federal Implementation Plan (FIP). The permit revision requires APS to shut down coal-fired Unit 2 boiler by April 1, 2016. Additionally, APS Cholla will be required to discontinue burning coal in Units 1, 3 and 4 by April 30, 2025.

PUBLIC PARTICIPATION PROCESS

A public notice for this permit and SIP revision commenced on June 10, 2015 and ended on July 14, 2015. Two public hearings were conducted in Holbrook and Phoenix to solicit comments. Written comments were received during the public comment period and written/oral comments were received at the public hearings.

All comments received have been made part of the public record and have been reviewed by ADEQ. This summary presents the Department's responses to the issues raised by the comments received during the public comment period.

COMMENTS AND RESPONSES

Comment: One commenter thanked ADEQ for the public hearing. The commenter wanted ADEQ to consider holding such hearings in the evening to allow more people to attend.

Response: ADEQ has taken note of this suggestion and will consider this for future hearings.

Comment: A few commenters suggested continued operation with coal in Cholla since coal-fired plants are economical, reliable, and clean (by adopting clean-coal -burning solutions).

Response: ADEQ acknowledges the comment.

Comment: One commenter stated that the Supreme Court's ruling regarding the EPA's Mercury and Air Toxic Standards (MATS) program was a "game changer" for Cholla.

Response: While ADEQ acknowledges that the MATS decision may have an impact on Cholla's business plans, it has not been notified by APS of any changes to the business plans than what has been considered in the BART Reassessment.

Comment: One commenter suggested the State and APS to consider renewable energy projects in the region to utilize existing transmission, land and other infrastructure.

Response: ADEQ acknowledges the comment.

Comment: One commenter opined that installation of selective catalytic reduction (SCR) controls would in fact increase the haze because of the usage of ammonia in SCR operations.

Response: Impacts of ammonia slippage were considered in the five-factor BART analysis for Cholla, as specifically discussed in BART Factor 2 - "Energy and Non-Air Environmental Impacts". For CALPUFF modeling, Cholla used an ammonia background concentration of 1.0 parts per billion (ppb), a typical background ammonia value used for BART modeling in the western states and approved by EPA

Comment: Some commenters urged regulators to keep the Cholla facility in operation because Cholla plays a significant role in regional and local economy (reliable electricity source, job opportunities, tax revenue, and other economic activities). For this reason, they supported the proposed SIP/permit revision as it would allow Cholla to continue to operate in an economical fashion without sacrificing any of the legal obligations.

Response: ADEQ acknowledges the comment.

Comment: Some commenters urged ADEQ to approve the proposed SIP/permit revision because it would provide greater long-term environmental benefits than the EPA FIP. In particular, using multi-pollutant BART approaches, one commenter performed a comprehensive review on the APS BART Proposal. Upon review, the commenter concluded that the APS BART Proposal will significantly reduce cumulative emissions of multiple pollutants (sulfur dioxide, particulate matter, mercury, and carbon dioxide) and also will provide long-term ozone benefits.

Response: ADEQ acknowledges the comment. ADEQ also appreciates the efforts from the commenter for conducting the multi-pollutant review.

Comment: One commenter stated that the proposals in the BART Reassessment are not intended or required to achieve more emission reductions and better visibility improvements in every year as compared to the EPA FIP requirements. The commenter pointed out that the proposals rise or fall on their own merits, and are independent of the EPA FIP.

Response: ADEQ concurs with the comment.

Comment: Some commenters expressed their opposition to the SIP revision. They indicated that the proposal is unacceptable because it allows Units 3 and 4 to continue burning coal for the next 10 years without updated pollution controls. They urged ADEQ to require APS and Pacific Corp to promptly install additional cost effective pollution controls on Units 3 and 4.

Response: ADEQ performed a five-factor BART analysis in accordance with 40 C.F.R. § 51.308(e)(1) and has determined that the exiting control (low-NOX burners with separated overfire air systems) is BART for Units 3 and 4 under the new circumstances (shutdown of Unit 2 in 2016 and the ultimate cessation of coal operations at all Cholla units by 2025). As demonstrated in the five-factor BART reassessment, additional post-combustion NOx controls, either SCR or SNCR, are not cost effective due to the excessive incremental costs ($7000 per ton of NOx for SNCR and $10000 per ton of NOx for SCR) coupled with minimal or moderate visibility improvements. Thus, these controls options were eliminated from consideration.

Comment: Some commenters were concerned about the damaging effect of coal-fired power plants on the national parks and wilderness areas. As they stated, Arizona's national parks such as the Grand Canyon and the Petrified Forest are dirty on many days of the year due to the coal firing for power generation. They supported the implementation of the EPA FIP because the EPA FIP required stronger and more stringent pollution controls.

Response: As documented elsewhere in the response to other specific comments, ADEQ performed a 110(l) analysis and has demonstrated that the BART Reassessment will achieve greater long-

term environmental benefits than the EPA FIP. While the BART Reassessment is less stringent than the EPA FIP for NOx controls during 2018-2025, neither the Clean Air Act nor any EPA regulations require a new BART determination to be more stringent in every instance, and at every point in time, to supersede a prior BART determination.

Comment: One commenter was concerned about the ability of future generations to enjoy the Grand Canyon and Arizona Wilderness areas due to firing of coal, and wanted enforcement of Clean Air Act.

Response: ADEQ is fully committed to implement Clean Air Act (CAA) and other rules/regulations to protect and enhance environment. As stated elsewhere in this document, the proposed revision complies with the CAA's visibility protection provisions, the Regional Haze Rule, and the BART Guidelines and will result in long-term environmental benefits.

Comment: One commenter stated that the BART Reassessment weakens Cholla's existing BART determination from the EPA FIP in violation of the Clean Air Act's anti-backsliding provision. The commenter pointed out that the BART Reassessment would result in greater air pollution and worse visibility impairment at Class I areas for nearly two decades after the BART compliance deadline. The commenter asserted that the existing BART determination is an "applicable requirement" under Clean Air Act Section 110(l), and any revisions resulting in greater air pollution and worse visibility impairment are contrary to the Clean Air Act's anti-backsliding provision.

Response: ADEQ disagrees with this comment. In EPA's review of a proposed BART FIP replacement SIP in Oklahoma where the state determined that the shutdown of one unit in 2016 and a second unit in 2026 was BART in light of the utility's decision to permanently retire those units (*i.e.,* due to the changed circumstances giving rise toBART reanalysis), EPA stated that "[s]uch a SIP revision need not adopt the same suite of control options and techniques as EPA's FIP, nor does it necessarily have to be as stringent as EPA's FIP in all instances." 78 Fed. Reg. 51,686, 51,691 (Aug. 21, 2013). EPA then applied Section 110(l) in the regional haze context, stating "EPA must approve a State's SIP revision so long as the State complies with the CAA's visibility protection provisions, the RHR, and the BART Guidelines, and makes a reasonable control determination based on the weighing of the five factors." *Id.* EPA explained that the "controlling facts" (*i.e.*, shutdown of the two units) for Oklahoma's revised BART analysis were different from the facts that were presented with the state's earlier SIP submission and, as a result, "the high incremental cost-effectiveness and low incremental visibility improvement" between the FIP and the shutdown scenario support the conclusion that the shutdown option is BART. *Id.* at 51,691-92. EPA thus proposed to approve the Oklahoma SIP even though it did not achieve the same level of visibility control throughout the period as did the FIP. *Id.* at 51,692. EPA confirmed this decision in the final rule. 79 Fed. Reg. 12,944 (Mar. 7, 2014). Thus, the commenter's insistence that Section 110(l) demands that the SIP must have, for a given time period, the same or lower emissions or the same or better visibility impact is misplaced.

As stated in the SIP Revision draft, the Department evaluated a new source-specific BART determination that was based on different circumstances than those that were evaluated in the EPA FIP. For example, when it promulgated the FIP, EPA did not consider the new circumstance of the ultimate cessation of coal operations at all Cholla units by dates certain (with an option to convert Units 3 and 4 to natural gas), nor did it consider the shutdown of Unit 2 by April 2016. As discussed above, EPA addressed, and approved, a similar approach with respect to an Oklahoma revised SIP, which included a proposed shutdown. *See* 78 Fed. Reg. 51,686 *et seq.*; 79 Fed. Reg. 12,944 *et seq.* The Department took these new circumstances into account and performed a five-factor BART analysis in accordance with 40 C.F.R. § 51.308(e)(1) as the basis for making a new BART control determination. Fundamentally, the BART Reassessment is independent of the EPA FIP. While the BART

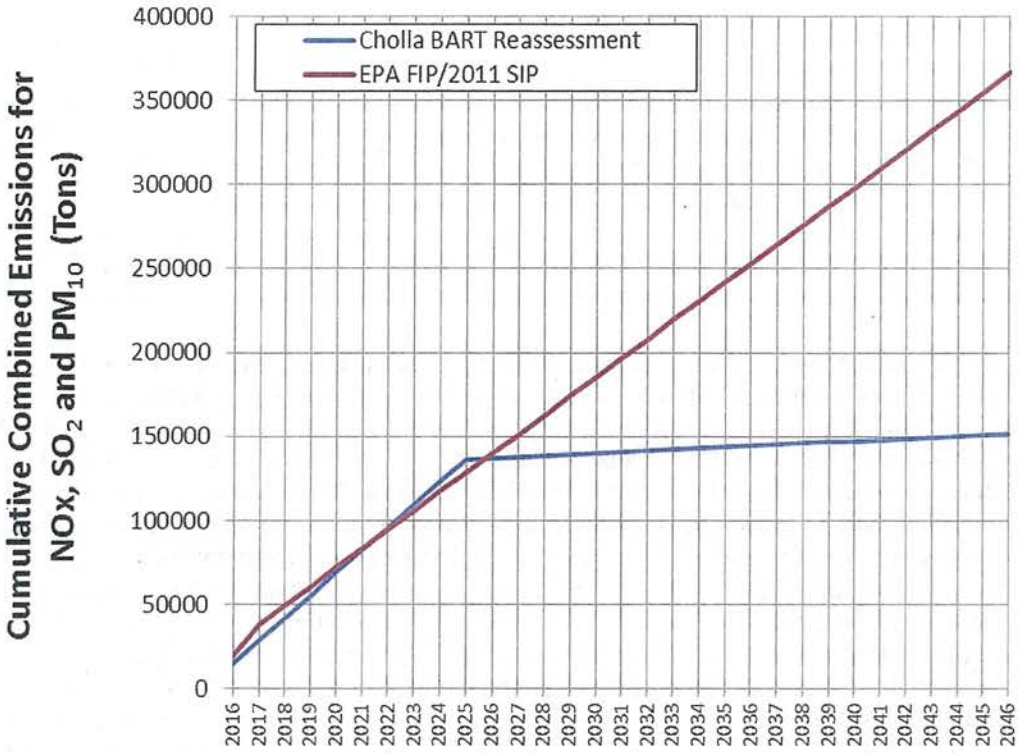
Reassessment is less stringent than the EPA FIP for NOx controls during 2018-2025, neither the CAA nor any EPA regulations require a new BART determination to be more stringent in every instance, and at every point in time, to supersede a prior BART determination.

In response to comments that the New Mexico's 2013 RH SIP revision failed to outperform the existing BART determination for San Juan Generating Station, EPA similarly stated that "Section 110(l) of the CAA does not prohibit a state from submitting a SIP revision that is less stringent than a FIP." Final BART Rule, 79 Fed. Reg. at 60,989. Section 110(l) of the CAA indicates that EPA cannot approve a SIP revision if the revision would interfere with any applicable requirements concerning attainment and reasonable further progress (RFP), or any other applicable requirements of the CAA. As presented in the SIP revision draft, ADEQ has demonstrated that the SIP revision would not interfere with attainment or maintenance of any NAAQS or any other CAA requirements based on the following considerations:

(1) Designated attainment or unclassifiable for the current NAAQS – Navajo County does not rely on the EPA FIP or any other emission reduction measures at Cholla to ensure continued attainment of the current NAAQS. The EPA FIP does not represent existing control measures that have been placed for attainment or maintenance of the NAAQS. Nor is it the control measures in a RFP plan that provide for meeting the reasonable further progress milestones for a non-attainment area.

(2) Facility-wide emissions for all pollutants (PM, SO_2, and NOx) at the Cholla Power Plant have been and will continue to be reduced under the BART Reassessment. The proposal will improve rather than worsen air quality.

(3) The BART Reassessment will achieve greater long-term emission reductions as compared to the existing BART determinations (the EPA FIP for NOx and the 2011 SIP for SO_2 and PM_{10}). Moreover, when comparing the combined emissions for PM_{10}, SO_2, and NOx, the results show that the BART Reassessment will achieve equivalent cumulative emission reductions in 2025 and much greater emissions reductions thereafter (see the chart below).



(4) ADEQ agrees that regional haze regulations for BART determinations are applicable requirements under Section 110(l) of the CAA. The Department has performed a five-factor BART analysis in accordance with 40 C.F.R. § 51.308(e)(1) for making a BART control determination. Moreover, the Department has demonstrated that the proposals under the BART Reassessment are consistent with long-term strategies to provide for reasonable progress towards the 2064 national goal established in the Clean Air Act. During the period of the first long-term strategy (through 2018), Cholla Power Plant has installed new baghouses, flue gas desulfurization (FGD), and low-NOx burners with separated over fire air systems (LNB with SOFA) to significantly reduce the emissions of PM, SO_2, and NOx, respectively. The plant will also permanently shut down Unit 2 by or before April 2016. During the period of the second long-term strategy (2019–2028), the plant will permanently cease burning coal at Units 3 and 4 by April 30, 2025 with the option to convert to pipeline quality natural gas by July 31, 2025 with an annual average capacity factor not to exceed 20 percent. Applying these controls would result in significant improvements in visibility and help ensure reasonable progress toward the national visibility goal. The analysis has shown that the BART Reassessment will achieve greater long-term visibility improvements as compared to the EPA FIP. Based on the above reasons, ADEQ has determined that the proposals have complied with the CAA's visibility protection provisions, the Regional Haze Rule, and the BART Guidelines.

It is important to clarify that the comparison analysis conducted for the BART Reassessment and the EPA FIP/2011 SIP was solely for the purpose of demonstrating the long-term environmental benefits from the new proposal. ADEQ did not seek to provide a BART alternative or to demonstrate that the proposal will achieve more emission reductions and better visibility improvements in every year as compared to the EPA FIP. The BART Reassessment must be treated as a new BART determination under the new set of circumstances presented. The BART Reassessment was not submitted to meet "better than BART" under 40 C.F.R. § 51.308(e)(2). Accordingly, those provisions do not apply.

Comment: One commenter stated that ADEQ's conclusion that the BART Reassessment complies with section 110(l) was unreasonable and flawed because it inappropriately discounted the timing of pollution reductions and the importance of promptly reducing pollution and improving visibility. Section 169A requires sources to install BART controls "as expeditiously as practicable but in no event later than five years." On the contrary, the Cholla BART Reassessment would allow Units 3 and 4 to continue operating without any new pollution controls for more than seven years after the mandatory five-year compliance deadline. Citing EPA's brief defending its regional haze plan for Navajo Generating Station, the commenter stated that SIPs cannot set a compliance deadline longer than five years.

Response: ADEQ disagrees with this comment. Under 40 C.F.R. § 51.308(e)(1), each source subject to BART is required to "install and operate BART as expeditiously as practicable but in no event later than five years after approval of the implementation plan revision." ADEQ performed a five-factor BART analysis in accordance with 40 C.F.R. § 51.308(e)(1) and has determined that LNB/SOFA is BART for Units 3 and 4. The Cholla Power Plant has already installed and is operating LNB/SOFA at Units 3 and 4, complying with the timing requirements. Although the new proposal includes conversion to natural gas-firing at Units 3 and 4 in 2025, ADEQ did not consider it as a BART control option under the BART determination process because it is beyond the mandatory five-year window. ADEQ appropriately considered the natural gas conversion in assessing whether the proposal is consistent with its long-term strategy for reducing regional haze. EPA has approved other SIP revisions where LNB/OFA was determined to be BART and the long-term strategy contained a more stringent control, including approval of the BART determination for the Jim Bridger power plant in Wyoming (which approved LNB/OFA as BART and the long-term strategy required the installation of SCR controls). 79 Fed. Reg. 5,032, 5,048-49 (Jan. 30 2014).

Comment: One commenter stated that ADEQ's reliance on the BART Reassessment's long-term benefits was unreasonable and flawed because it was based on arbitrary and unfounded assumptions. As the commenter argued, ADEQ assumed that Cholla's pollution would remain at constant levels indefinitely after the utilities install SCR in 2017 under the EPA FIP. However, the haze program will necessarily require additional emission reductions from BART sources if they continue to operate decades after their initial BART determination. In particular, the commenter argued that, if Cholla was still operating under the existing BART determination (EPA FIP) when those benefits would finally materialize in the 2030s and beyond, the haze program would likely require Cholla to further reduce its pollution.

Response: ADEQ agrees that a source that installs BART controls is not forever exempt from further pollution reductions under the regional haze program. The commenter argued that the emission levels cannot remain constant indefinitely after the Cholla facility installs SCR in 2017, as required by the EPA FIP. First, ADEQ notes that when faced with similar comments, EPA noted that it is reasonable to expect that a plant installing expensive controls, as is required under the FIP, would seek to keep operating to recover the investment, and that it is reasonable to factor in the commitment for shorter lifespans or changes in utilization. 79 Fed. Reg. at 12,951. Second, the same argument can also be made as to the control strategy in the BART Reassessment. Cholla may be subject to further pollution controls if the controls under the BART Reassessment, upon review in the future, may not be sufficient in order to meet the national visibility goal. However, it is important to stress that, pursuant to 40 C.F.R. §§ 308(d)(1)(1)(A) and (f)(3), before such additional measures may be imposed on a source, the control authority must determine whether doing so would be reasonable by considering, among other things, the costs of compliance, the time necessary for compliance, and the remaining useful life of the source.

ADEQ has demonstrated that the BART Reassessment will achieve greater cumulative NOx emission reductions and visibility improvements than the EPA FIP over the long term without requiring additional controls. The Department believes that the assumption is reasonable. If the facility installs SCR as BART in December 2017 as required by the EPA FIP, ADEQ expects that the facility would likely operate the controls for over a decade without needing to install additional controls since the control agencies will have sufficient time to evaluate whether additional controls are needed to meet the 2064 national goal. Beyond the 2030 time frame, as the commenter argued, additional emission reductions could potentially be required, which might require the installation of additional control technology because, as explained above, the BART Reassessment is not exempt from further emission reduction requirements in subsequent regional haze planning periods. But the Department's analysis must utilize reasonable assumptions based on the best available information at this stage rather than speculate what could occur several decades into the future. The potential that further additional controls might be necessary beyond the 2030 time frame does not change the Department's conclusion that the BART Reassessment will achieve greater long-term environmental benefits than the EPA FIP.

Comment: One commenter stated that ADEQ and EPA cannot now "re-do" or "reassess" the existing BART determination in a manner that results in more pollution and more visibility impairment, as the Clean Air Act's anti-backsliding provision places critical limits on the utilities' attempts to issue a new BART determination years after EPA finalized the existing BART determination.

Response: ADEQ disagrees with the comment (see the discussion above). In addition, as presented in the SIP Revision Draft, the Department has demonstrated that the BART Reassessment will achieve greater long-term environmental benefits as compared to the applicable SIP or FIP, considering both emission reductions (for PM_{10}, SO_2, and NOx) and visibility improvement. The Clean Air Act's anti-backsliding provision does not prohibit the control agencies from reassessing the existing SIP/BART determination as long as the revisions would not interfere with any applicable requirements concerning attainment and reasonable further progress, or any other applicable requirements of the CAA. As explained above, the SIP revision has complied with the CAA's visibility protection provisions, the Regional Haze Rule, and the BART Guidelines.

Comment: One commenter stated that, at minimum, ADEQ should revise its BART determination to select SNCR controls as BART for Units 3 and 4. The commenter pointed out that SNCR controls were cost-effective based on the average cost-effectiveness values. The commenter further pointed out that installing SNCR at Units 3 and 4 would result in a significant visibility improvement compared to existing controls (a 1.32 dv cumulative visibility improvement). Moreover, citing EPA's decision on the BART determination for Apache Generating Station (AEPCO), the commenter stated that ADEQ weighed the BART factors based only on SNCR's incremental costs but EPA has specifically cautioned against doing so.

Response: ADEQ disagrees with the comment. ADEQ believes that the Department has made a reasonable determination to eliminate SNCR as BART for Units 3 and 4 based on the five-factor analysis. As presented in the SIP Revision Draft, the SNCR-based control (SNCR with LNB+SOFA) has an average cost-effectiveness of around $3,100 per ton and an incremental cost effectiveness of around $7,000 per ton (over the LNB/SOFA control option) for Units 3 and 4. While the average cost-effectiveness of the SNCR-based control option on Units 3 and 4 might be considered reasonable, the Department has determined that its incremental cost-effectiveness is excessively high when taking the incremental visibility improvement into account. According to the Appendix Y BART Guidelines (40 C.F.R. Part 51, App. Y, § IV.D.4.5.e), it would be inappropriate to choose a control technology with very high incremental costs even though its average cost may be considered reasonable.

The commenter argued that the SNCR-based control option would result in a 1.32 dv cumulative visibility improvement over 13 Class I areas as compared to existing controls (LNB/SOFA). While the SNCR-based control option would result in a cumulative visibility improvement of 1.32 dv, the incremental visibility improvement from this control scenario ranges from 0.01 dv to 0.28 dv at individual Class areas, and the average incremental visibility improvement over the 13 Class I areas is only 0.1 dv. There is no significant difference in the number of days with impacts over 1 dv between the two control scenarios over a 3-year modeling period (13 days for Petrified Forest National Park and less than 10 days for the other 12 Class I areas). Overall, the Department finds that the differences in visibility impacts between the two control scenarios to be relatively minor for most of the Class I areas examined. In a BART determination process, visibility improvements must be evaluated in accordance with the Appendix Y BART Guidelines (40 C.F.R. Part 51, App. Y, § IV.D.5). As discussed earlier, the SNCR-based control option (over LNB/SOFA) would have an incremental cost of approximately $7,000 per ton, which is excessive in the Department's determination. It should also be noted that the modeled visibility benefits of SNCR would only last for approximately seven years, after which the closure or conversion to gas at Units 3 and 4 will eliminate or greatly reduce the visibility benefit of SNCR. The small additional visibility benefits do not justify the large increase in costs associated with the installation of SNCR.

The circumstances of the Cholla BART determination significantly differ from those in the AEPCO case. For AEPCO, the incremental cost-effectiveness of the SNCR-based control option was $2,837 per ton with a maximum incremental improvement of 0.47 dv at the highest impacted Class I area. For Cholla, the incremental cost-effectiveness would be around $7,000 per ton with a maximum incremental improvement of 0.28 dv. While the SNCR-based control option was cost-effective for the AEPCO case, based on EPA's analysis, the Department believes that the SNCR-based control option is not cost-effective for Cholla and should be eliminated as BART.

Comment: One commenter stated that the ADEQ's cost analysis was flawed because it artificially inflated the cost for SNCR and SCR by using a remaining useful life of 20 years. Instead, the commenter suggested using a remaining useful life of 7.4 years since either SNCR or SCR would be ineffective for reducing NOx emissions due to the natural gas conversion in 2025. Based on the remaining useful life of 7.4 years, the commenter recalculated the average cost-effectiveness for both SNCR and SCR and determined that both SNCR and SCR were cost-effective. Since SCR would be cost-effective and would result in significant visibility improvements ADEQ should select SCR as BART for Units 3-4, the commenter stated.

Response: ADEQ disagrees with the comment. As defined in the Appendix Y BART Guidelines (40 C.F.R. Part 51, App. Y, § IV.D.4.5.k), the remaining useful life is the difference between "the date the controls will be put in place..." and "the date that facility permanently stops operation." It is reasonable to presume 20 years of operation because, if Units 3 and 4 were required to install SNCR or SCR as BART, the units would be required to operate for 20 years or more in order to recoup the cost of these investments. The Department believes that it would be inappropriate to use a remaining useful life of 7.4 years for a cost-effectiveness analysis, and any conclusions based on the "7.4 years" remaining useful life are not justified. What *is* appropriate is to use a 20-year amortization period that makes an adjustment for the type of fuel burned as was done in the BART Reassessment—that is, to calculate the SCR and SNCR cost- effectiveness in years 1-8 assuming coal-firing, calculate the cost effectiveness of these post-combustion NOx controls assuming a conversion to pipeline quality natural gas for years 9 through 20, and, finally, calculating the average cost effectiveness of SCR and SNCR over the entire 20-year life. Calculating cost effectiveness in this manner appropriately allows Cholla to recoup its investment in this technology and

accurately reflects the actual operation of these controls over the 20-year period.

As discussed above, the BART Reassessment correctly presumed a 20-year amortization period for post-combustion NOx controls. Nevertheless, even if the cost effectiveness of SCR and SNCR is calculated assuming a 7.4-year amortization period as the commenter proposed, the cost effectiveness of these controls is still excessive. Assuming a 7.4-year life, the incremental cost effectiveness of SCR and SNCR at Cholla Unit 3 are $7,383 and $5,588, respectively. At Cholla Unit 4, these numbers increase to $8,437 and $5,680, respectively. Detailed calculations are shown in the table below. Judging the minimal visibility improvement against an incremental cost of more than $5,500 per ton that will result from the installation and operation of SNCR, ADEQ has determined that SNCR is not cost-effective. Similarly, ADEQ has determined that SCR is not cost-effective as well, judging the moderate visibility improvement against an excessive cost of more than $7,300 per ton from SCR. Based on the analysis above, ADEQ concludes that post-combustion NOx control technology is not cost-effective, whether assuming a 20-year useful life or a 7.4-year useful life.

Average and Incremental Cost Effectiveness for Unit 3 Assuming 7.4 Years of Operation on Coal

	Control Options		
	LNB+SOFA	SNCR with LNB+SOFA	SCR with LNB+SOFA
Capital Cost ($)[1]	3,848,807	19,238,125	83,461,195
Annualized Capital Cost ($/yr)[2]	683,317	3,415,537	14,817,701
Annual O&M($)[1]	120,000	1,254,500	1,570,766
Total Annual Cost ($)	803,317	4,670,037	16,388,467
Emission Reduction (ton/yr)[3]	1,219	1,911	3,330
Average Cost Effectiveness ($/ton)	659	2,444	4,921
Incremental Total Annual Cost ($/yr)[4]		3,866,720	15,585,149
Incremental Emission Reduction(ton/yr)[4]		692	2,111
Incremental Cost Effectiveness ($/ton)[4]		5,588	7,383

[1] *ADEQ SIP Revision Appendix B Table B-1*

[2] *CRF = 0.17754 (i=0.07, n=7.4)*

[3] *ADEQ SIP Revision Appendix B Table B-2*

[4] *The incremental cost effectiveness results for SNCR and SCR are based on the emission and cost differences between these technologies and the proposed LNB +SOFA option.*

Average and Incremental Cost Effectiveness for Unit 4 Assuming 7.4 Years of Operation on Coal

	Control Options		
	LNB+SOFA	SNCR with LNB+SOFA	SCR with LNB+SOFA
Capital Cost ($)[1]	5,334,618	24,885,052	119,083,832
Annualized Capital Cost ($/yr)[2]	947,108	4,418,092	21,142,144
Annual O&M($)[1]	170,000	1,737,393	2,350,182
Total Annual Cost ($)	1,117,108	6,155,485	23,492,326
Emission Reduction (ton/yr)[3]	1,756	2,643	4,408
Average Cost Effectiveness ($/ton)	636	2329	5329
Incremental Total Annual Cost ($/yr)[4]		5,038,377	22,375,217
Incremental Emission Reduction(ton/yr)[4]		887	2,652
Incremental Cost Effectiveness ($/ton)[4]		5,680	8,437

[1] *ADEQ SIP Revision Appendix B Table B-7*

[2] *CRF = 0.17754 (i=0.07, n=7.4)*

[3] *ADEQ SIP Revision Appendix B Table B-8*

[4] *The incremental cost effectiveness results for SNCR and SCR are based on the emission and cost differences between these technologies and the proposed LNB +SOFA option.*

Comment: One Commenter opined that the BART emission limits for SO_2 do not reflect current operating levels and suggested that the limits be reduced.

Response: ADEQ acknowledges the comment. The Department performed a five-factor BART analysis in accordance with 40 C.F.R. § 51.308(e)(1) for making a BART control determination for sulfur dioxide. In light of that analysis, it is the Department's position that the BART determination for sulfur dioxide should remain unchanged. It is the Department's understanding that APS is giving consideration to the commenter's suggestion and may elect to pursue a permit revision to incorporate a more stringent sulfur dioxide limit on a voluntary basis.