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October 21, 2011

Via E-Mail and U.S. Mail

The Honorable Lisa P. Jackson
Administrator, U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
(jackson.lisa@epa.gov)

Re: Petition for Reconsideration and Stay of EPA's Final Rule: "Approval and Promulgation of Implementation Plans; New Mexico; Federal Implementation Plan for Interstate Transport of Pollution Affecting Visibility and Best Available Retrofit Technology Determination"(Docket No. EPA-R06-OAR-2010-0846)

Dear Administrator Jackson,

Pursuant to section 307(d)(7)(B) of the Clean Air Act ("CAA" or "Act"), 42 U.S.C. § 7607(d)(7)(B), the New Mexico Environment Department ("NMED"), individually and on behalf of Susana Martinez, Governor of the State of New Mexico, hereby respectfully petitions the United States Environmental Protection Agency ("EPA" or "Agency") to grant reconsideration of EPA's final rule signed August 4, 2011, entitled "Approval and Promulgation of Implementation Plans; New Mexico; Federal Implementation Plan for Interstate Transport of Pollution Affecting Visibility and Best Available Retrofit Technology Determination" for the San Juan Generating Station ("San Juan" or "SJGS"). 76 Fed. Reg. 52388 (Aug. 22, 2011) ("Final Rule"). Governor Martinez and NMED also hereby petition EPA to stay the effectiveness of the Final Rule pending EPA's reconsideration.

Section 307(d)(7)(B) of the Act provides that:

> Only an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review. If the person raising an objection can demonstrate to the Administrator that it was impracticable to raise such objection within such time or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule, the Administrator shall convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed. If the Administrator refuses to convene such a proceeding, such person may seek review of such refusal in the United States court of appeals for the appropriate circuit (as provided in subsection (b) of this section). Such reconsideration shall not postpone the effectiveness of the rule. The effectiveness of the rule may be stayed during such reconsideration, however, by the Administrator or the court for a period not to exceed three months.

Section 307(d)(7)(B) applies to this rulemaking, in which EPA promulgated a federal implementation plan ("FIP") under section 110(c) of the Act, 42 U.S.C. § 7607(c), because section 307(d)(1)(B) of the Act, 42 U.S.C. § 7607(d)(1)(B), applies the provisions of CAA section 307(d) to "the promulgation or revision of an implementation plan by the [EPA] Administrator under section 110(c) of this Act." *See also* 76 Fed. Reg. at 52439 (recognizing that "this action is subject to the requirements of CAA section 307(d) as it promulgates a FIP under CAA section 110(c)").

Governor Martinez and NMED raise the objections to the Final Rule described in this petition because the grounds for these objections (i) arose after the period for public comment on the proposed rule, but within the time for judicial review, or otherwise were impracticable to raise during the public comment period, and (ii) are of central relevance of the outcome of the rulemaking. These objections are discussed in detail below. Concurrently with this petition, Governor Martinez and NMED are filing in the Tenth Circuit Court of Appeals a Petition for Review of the Final Rule.

In addition, by means of this petition, we join the "Request for Administrative Stay of EPA's Final Rule: 'Approval and Promulgation of Implementation Plans; New Mexico; Federal

Implementation Plan for Interstate Transport of Pollution Affecting Visibility and Best Available Retrofit Technology Determination' (Docket No. EPA-R06-OAR-22010-846)" filed by Public Service Company of New Mexico ("PNM") on September 16, 2011 ("PNM Request for Administrative Stay"). We adopt all arguments and assertions in that document as if set forth fully herein. Apart from the issues raised in the PNM Request for Administrative Stay, Governor Martinez and NMED raise their own additional grounds in support of a stay. In addition to the irreparable harm that PNM, the other San Juan co-owners and, most importantly, consumers in New Mexico will suffer as a result of the EPA's decision, New Mexico will suffer a unique form of irreparable harm. The irreparable harm suffered by New Mexico (hereafter, "New Mexico" or "the State"), and other similarly situated states, is the usurpation of their sovereignty as a result of EPA's failure to accord the required deference to their determinations under the CAA and the EPA regional haze rule. As explained in more detail in Section II.B below, the CAA gives New Mexico, and all other affected states, the right to determine the best manner in which to meet regional haze requirements. EPA has unlawfully usurped the State's authority by failing to properly consider and to defer to New Mexico's determination of BART for San Juan. This intrusion on the sovereignty of the State constitutes an irreparable injury that, in and of itself, justifies a stay. *See Kansas v. U.S.*, 249 F.3d 1213, 1227-28 (10th Cir. 2001).

I. Background

New Mexico has long been at the forefront in addressing regional haze at National Parks and Wilderness Areas, as required by the Act. New Mexico was an active participant in the Grand Canyon Visibility Transport Commission and the Western Regional Air Partnership ("WRAP")[1], which helped develop the programs and policies now codified in the EPA's regional haze rule. (40 C.F.R §§ 51.308 – 309). In 2003, New Mexico was among the first states to submit to EPA a State Implementation Plan ("SIP") under the regional haze rule. (Due to subsequent legal challenges to the rule and other intervening events, EPA never acted on that SIP submittal).

As part of its ongoing efforts to remedy and prevent regional haze, from 2007 to 2011, NMED conducted extensive information gathering and analyses to determine the Best Available Retrofit Technology ("BART") for the San Juan Generating Station ("San Juan"), as required by CAA 169A(b), 42 U.S.C. § 7491(b). Under this provision, states determine and establish, on a case-by-case basis, emission limits representing BART for certain sources of air emissions.[2]

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[1]WRAP is a voluntary organization of western states, tribes and federal agencies tasked with performing regional planning activities, such as visibility modeling, needed by states and tribes to implement EPA's regional haze rule. *See* Western Air Regional Partnership, available at http://www.wrapair2.org/.

[2]See 42 U.S.C. § 7491(g)(7) (listing categories of "major stationary sources" to which BART requirements may apply).

New Mexico's BART determination for San Juan began on November 9, 2006, when NMED notified the Public Service Company of New Mexico ("PNM") that San Juan was a BART-eligible facility and that a BART analysis was required. PNM submitted an initial BART demonstration on June 6, 2007. Responding to requests for additional analyses from NMED, PNM provided additional air quality modeling and cost data in November 2007, March 2008, May 2008, August 2008, March 2009, and February 2011, and also provided responses to numerous more narrowly focused requests for information.[3]

After thorough consideration of these analyses in accordance with EPA's Guidelines for BART Determinations Under the Regional Haze Rule 40 C.F.R. Part 51 App. Y (the "BART Guidelines"), NMED proposed on February 28, 2011 a regional haze SIP which among other things, contained the State's BART determination for San Juan. Specifically, the SIP sets the nitrogen oxides ("NOx") limit for the San Juan units at 0.23 lb/mmBtu, using selective noncatalytic reduction ("SNCR"). That emission rate is consistent with the EPA-established presumptive NOx BART rate for the type of units, and the type of coal burned, at San Juan. 70 Fed. Reg. at 39172. On June 3, 2011, the New Mexico Environmental Improvement Board approved the proposed SIP, and Governor Martinez submitted the SIP to EPA on June 29, 2011, which was received July 5, 2011. ("July 5, 2011 regional haze SIP").

During the same period NMED was developing its SIP, EPA, on January 5, 2011, proposed the FIP rule at issue here. ("Approval and Promulgation of Implementation Plans; New Mexico; Federal Implementation Plan for Interstate Transport of Pollution Affecting Visibility and Best Available Retrofit Technology Determination," 76 Fed. Reg. 491 ("Proposed Rule")). The Proposed Rule, among other things, would have imposed extremely stringent additional limits on NOx emissions from San Juan. EPA invoked as authority for its Proposed Rule two different provisions of the CAA that address (i) the protection of visibility in designated national parklands and wilderness areas, *i.e.*, the regional haze provisions of CAA §§ 169A & 169B , and (ii) the prohibition of a state's emissions from interfering with required visibility-protection measures in another state, *i.e.*, the interstate transport provision at CAA § 110(a)(2)(D)(i)(II). Unlike many other CAA provisions, these provisions address an aesthetic issue -- *i.e.*, visibility in certain areas -- and not any public health objectives.[4]

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[3] See NMED Notice of Intent to Present Technical Testimony, Exhibits 6a – 6i and 7a – 7u, at: http://www.nmenv.state.nm.us/aqb/reghaz/Regional-Haze_index.html.

[4] Based on a compilation of worldwide annual average particulate matter (specifically, microscopic particulate matter or $PM_{2.5}$) concentrations recently made available by the World Health Organization, Farmington, New Mexico, a city with a population of 46,000 which is approximately 16 miles from San Juan, has the 6th lowest (6th cleanest) value among U.S. cities included in the database and the 27th lowest (27th cleanest) value among worldwide cities included in the database.

The first authority invoked by EPA, CAA section 169A(g)(2), defines BART by reference to five "consideration" factors, including consideration of "the costs of compliance" with the emission limits, that states must consider. 42 U.S.C. § 7491(g)(2). Just as with most technology-based standards under the CAA (*e.g.*, CAA § 111, New Source Performance Standards) and the Clean Water Act, states must consider each of the statutory factors, but states' determinations as to the "weight" they give each factor cannot be second-guessed by EPA. *See New York v. Reilly*, 969 F.2d 1147, 1150 (D.C. Cir. 1992); *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1045-47 (D.C. Cir. 1978); CAA § 169A(g)(7). Where states establish BART emission limits for facilities under the CAA, they do so through revisions to their SIPs that are submitted to EPA for review and approval or disapproval.[5] CAA § 169A(b)(2), 42 U.S.C. § 7491(b)(2); CAA § 110(a), (k), 42 U.S.C. § 7410(a), (k); *see generally American Corn Growers Ass'n v. EPA*, 291 F.3d 1, 5-9 (D.C. Cir. 2002) (discussing states' broad discretion in making BART determinations under the CAA for sources within their borders).

In the event a state takes no action to develop and set BART limits and to incorporate those limits in a SIP revision submitted to EPA, EPA may propose such limits for the state as a federal implementation plan ("FIP"). CAA § 169A(b)(2), 42 U.S.C. § 7491(b)(2); CAA § 110(c), 42 U.S.C. § 7410(c). In January 2011, before New Mexico had submitted a BART SIP to EPA reflecting the State's balancing of the BART factors and the weight to be given to them, EPA proposed to impose BART limits on San Juan through a FIP. 76 Fed. Reg. at 492.

As noted above, in the Proposed Rule, EPA also invoked CAA section 110(a)(2)(D)(i)(II), 42 U.S.C. § 7410(a)(2)(D)(i)(II), which provides that a state's SIP is to contain adequate provisions prohibiting emissions from within the state in amounts that will "interfere with measures required to be included in the applicable implementation plan for any other State ... to protect visibility." In 2007, New Mexico submitted an interstate transport SIP revision addressing this visibility-related provision. The 2007 SIP complied with applicable EPA guidance. Nevertheless, EPA in its January 2011 FIP rulemaking, for the first time, proposed to determine that the New Mexico SIP revision was inadequate. EPA failed to take timely action on the 2007 interstate transport SIP revision pursuant to 42 U.S.C. § 7410(k)(1) & (2), which requires that EPA act upon a SIP within no more than 18 months. 76 Fed. Reg. at 493, 497, 498. In the Final Rule, consistent with its Proposed Rule, EPA instead imposed

[5]Under the CAA, states develop SIPs containing the regulatory requirements necessary to implement the various air pollution control programs required under the Act. Thus, SIPs address, for instance, the specific measures necessary to ensure attainment of the national ambient air quality standards ("NAAQS"), requirements regarding interstate transport of regulated air pollutants, and regional haze requirements, among other CAA requirements. Due to the complexity of these regulatory programs, New Mexico, like most states, does not have a single SIP addressing all of these requirements. Rather, it has a number of individual SIPs that cover individual aspects of these CAA requirements. At issue in this rulemaking are New Mexico's 2007 revisions to its Interstate Transport SIP and its 2011 Regional Haze SIP, submitted to EPA on July 5, 2011 (along with additional 2011 revisions to its Interstate Transport SIP).

additional, more stringent NOx emission limits on San Juan because, according to EPA, those limits were needed to correct a purported deficiency in New Mexico's interstate transport SIP. 76 Fed. Reg. at 52389-90.

EPA set its proposed BART limit for NOx emissions from San Juan at an exceptionally stringent level of 0.05 pounds per million British thermal units (0.05 lb/mmBtu). *Id.* at 493. As EPA acknowledged, meeting that emission limit would require installation and operation of additional, very expensive emission controls -- "post-combustion" control technology known as selective catalytic reduction ("SCR"). SCR is considerably more costly than the emission controls (known as "combustion controls") that EPA, in its CAA rules governing NOx BART determinations for electric generators, had previously determined presumptively satisfy the statutory BART test for electric generating facilities with the type of boiler and the type of fuel burned at San Juan. *See* 70 Fed. Reg. 39,104, 39,172 (July 6, 2005) (EPA regulation promulgating the BART Guidelines). SCR is likewise considerably more costly than the controls that New Mexico determined to be BART for San Juan. EPA's Proposed Rule would have required that San Juan satisfy the proposed BART limit within only a three-year period after the Final Rule's effective date. 76 Fed. Reg. at 504.

On August 4, 2011, EPA proceeded to publish its Final Rule adopting a FIP, despite its receipt of New Mexico's BART SIP submission (a SIP submission that EPA *must* ultimately approve because it satisfies applicable CAA requirements) and despite written requests in rulemaking comments to EPA, and in written communications to EPA after the New Mexico SIP had been submitted, asking the Agency to defer final action in its BART rulemaking pending its review and consideration of New Mexico's SIP.[6] The Final Rule imposes the very stringent, SCR-based 0.05 lb/mmBtu emission limit for NOx that is inconsistent with New Mexico's submitted SIP revision requiring SNCR and a NOx emission limit of 0.23 lb/mmBtu.

In finalizing its own BART determination, EPA ignored New Mexico's balancing of the BART consideration factors, and the weight to be given to those factors, including cost.[7] New Mexico's SIP establishes a BART NOx emission limit for San Juan that is less stringent (and that imposes less costly compliance obligations) than EPA's 0.05 lb/mmBtu limit but that nonetheless satisfies the EPA BART rules' presumptive rate requirement. Moreover, the emission limit that New Mexico determined to be BART for San Juan is *more stringent* than the

[6] A copy of the State's written request, dated March 21, 2011, is attached to this Petition as Exhibit A (Letter from Secretary David Martin to Dr. Alfredo Armendiraz).

[7] *See* 76 Fed. Reg. at 52389, 52394.

limit EPA asserted was needed to meet New Mexico's CAA section 110(a)(2)(D)(i)(II) obligation.[8]

Governor Martinez and NMED file this petition for reconsideration and stay under the CAA to address specific objections to EPA's Final Rule, adequate notice of which was not provided in the Proposed Rule, thereby depriving New Mexico and the public of their comment opportunity under section 307(d)(3) and (5) of the Act, 42 U.S.C. § 7607(d)(3), (5), or which arose after the close of the comment period on the Proposed Rule. These objections are of central relevance to the outcome of the Final Rule. For the reasons described below, Governor Martinez and NMED request that, in compliance with section 307(d) of the CAA, EPA promptly convene a proceeding for reconsideration of the Final Rule.

II. Grounds on Which EPA Should Convene Reconsideration Proceedings and Stay the Rule

A. EPA's Assertion that the Consent Decree Deadline Compelled Action on a BART FIP at This Time is Incorrect and Undermines the Validity of the Final Rule.

In June 2009, WildEarth Guardians sued EPA in the United States District Court for the Northern District of California alleging that the Agency had failed to perform a nondiscretionary duty either to approve a SIP or to promulgate a FIP for New Mexico and six other states to satisfy the requirements of section 110(a)(2)(D)(i) of the CAA (the interstate transport provision) with respect to the 1997 ozone and $PM_{2.5}$ NAAQS. *WildEarth Guardians v. Jackson*, Case No. 4:09–CV–02453–CW. New Mexico's interstate transport visibility SIP submission had been pending with the EPA since September 17, 2007. The *WildEarth* lawsuit culminated in the entry of a consent decree reflecting an agreement between WildEarth Guardians and EPA establishing deadlines for EPA action on *interstate transport visibility SIPs*. That consent decree, as amended, established August 5, 2011, as the date by which EPA was required either to approve New Mexico's interstate transport visibility SIP, to promulgate an interstate transport visibility FIP, or to approve an interstate transport visibility SIP in part with promulgation of a partial FIP.

[8]EPA said that, to satisfy CAA section 110(a)(2)(D)(i)(II), New Mexico should impose a NOx emission limit on the San Juan units of 0.28 lb/mmBtu for two of the four units and 0.27 lb/mmBtu for the other two units. *See, e.g.*, 76 Fed. Reg. at 52424; 76 Fed. Reg. at 497-98. The SIP's emission rate limit of 0.23 lb/mmBtu on each of the units therefore more than satisfies the EPA-determined requirements. *See* Order and Statement of Reasons for Adoption of SIP Revisions, at 5, In the Matter of Proposed Revisions to the State Implementation Plan for Regional Haze Under 40 C.F.R. § 51.309, No. EIB 11-01(R) (New Mexico Envtl. Improvement Bd., June 3, 2011); New Mexico Env't Dep't Air Quality Bureau BART Determination, Public Service Company of New Mexico San Juan Generating Station, Units 1-4, at 33 (Feb. 28, 2011); *see also* 40 C.F.R. Part 51, App. Y, § IV.E.5 Table 1 (listing presumptive BART NOx limits).

WildEarth Guardians v. Jackson, Notice of Stipulated Extensions to Consent Decree Deadlines, at 2 (Apr. 28, 2011).

For the first time in its Final Rule establishing regional haze BART for San Juan, EPA asserts that its action is compelled by this *WildEarth Guardians* consent decree. EPA's Proposed Rule, signed on December 20, 2010, *see* 76 Fed. Reg. at 506, made no mention of the consent decree or the *WildEarth Guardians* case, even though the consent decree at that time required proposed EPA action on the 2007 New Mexico interstate transport visibility SIP submission by December 22, 2010. *WildEarth Guardians v. Jackson*, Notice of Stipulated Extension to Consent Decree Deadline (Nov. 5, 2010). Thus, EPA in its Proposed Rule plainly could have, but failed to, put commenters on notice of its view -- publicly articulated by EPA for the first time in the Final Rule -- that the consent decree schedule for *interstate transport* visibility requirements also imposed constraints on its schedule for acting on *BART regional haze* implementation plans, even though the consent decree itself plainly does not address BART requirements. Had EPA provided that notice, New Mexico and members of the public could have commented in detail that the consent decree imposes no such constraints on the EPA's BART decision-making or rulemaking and should not be interpreted to do so. EPA's failure to provide notice on this critical element of its Final Rule violates EPA's obligation under CAA section 307(d)(3) to provide notice of "the major legal interpretations and policy considerations" underlying the rulemaking.[9]

Moreover, EPA's determination to promulgate a BART FIP by the August 5, 2011 consent decree deadline for interstate transport visibility plans is substantively flawed. EPA explains its rationale for its action as being designed "[t]o provide greater certainty":

> To provide greater certainty to the SJGS that controls needed to prevent interference with other states' visibility programs, as well as the controls needed to meet the RHR's BART requirements, do not conflict with each other and end up imposing unnecessary greater costs upon the SJGS, we are imposing a BART NOx emission limit that meets both requirements at this time, rather than postponing action on this RH SIP requirement.

[9] In a July 14, 2010 letter from Thomas Diggs of EPA Region 6 to Mary Uhl of the NMED Air Quality Bureau, EPA discussed the relationship between the regional haze SIP and the visibility transport SIP. After setting out the deadlines for CAA § 110(a)(2)(D)(i)(II) SIP/FIP promulgation imposed by the consent decree with WildEarth Guardians, the letter states: "New Mexico's prompt submittal of a Regional Haze SIP, that includes a discussion of how 110(a)(2)(d)(i)(II) has been met, should address the requirements set forth above." Thus, the letter explains that the regional haze SIP *may* satisfy visibility transport SIP requirements and thereby meet the consent decree deadlines, but nowhere does it suggest that the regional haze SIP (including BART determinations, which are not even mentioned in the letter) *must* be submitted by the transport SIP deadlines in order to be considered by EPA. Moreover, even if the letter had put forth such an interpretation, no such letter could have satisfied the public notice requirements of CAA section 307(d)(3).

76 Fed. Reg. at 52419. EPA also attempts to further intertwine its obligations to act under section 110(a)(2)(D) and section 169A by arguing that "[t]he FIP clocks of both statutory requirements have expired and we therefore have an obligation to act now under the CAA." *Id.* at 52412. Neither of these arguments provides a persuasive or permissible reason for subjecting New Mexico's regional haze BART obligations to the consent decree's deadline for action on interstate transport plans or for promulgating a FIP in lieu of approving New Mexico's submitted SIP.

EPA's first argument -- that promotion of certainty and efficiency weighs against imposing controls under the CAA's interstate transport provisions that may be less stringent than subsequently promulgated BART controls -- proceeds from the false premise that New Mexico's interstate transport visibility obligations are in fact necessarily less stringent than BART requirements. EPA assumed that SCR would be required as BART, [10] while tacitly acknowledging that New Mexico's section 110(a)(2)(D)(i)(II) (interstate transport) obligation could be satisfied with SNCR meeting the 0.27/0.28 lb/mmBtu emission rates assumed by WRAP and adopted by EPA. *Id.* at 52419 (suggesting that an emission limit needed to address interstate transport obligations with respect to San Juan would "conflict with" the BART limit). EPA's assertion that SCR is required as BART, notwithstanding New Mexico's determination that *SNCR* represents both BART for San Juan and satisfies any interstate transport requirement, is critically flawed. To satisfy any § 110(a)(2)(D) requirements under the consent decree, EPA should have either (1) approved the 2007 interstate transport SIP, or, alternatively, approved the 2011 regional haze SIP (and 2011 supplemental interstate transport SIP) as being even more stringent than the WRAP emission rate assumptions, or (2) promulgated a FIP under § 110(a)(2)(D) imposing emission limits no more stringent than those WRAP emission rate assumptions. EPA should *not* have promulgated a BART FIP but instead should have deferred promulgation of any BART FIP at least until after EPA completed review of New Mexico's July 5, 2011 regional haze SIP.

EPA is incorrect that it is bound "to act now" on BART requirements on the grounds that the "FIP clocks" for both BART and interstate transport requirements have expired. Although the statutory timeframe for EPA action on a BART FIP (or, alternatively, on approval of a BART SIP) expired in January 2011,[11] no court has issued any order enforcing that statutory deadline or

[10]Indeed, EPA appears to have simply assumed, without undertaking the statutorily required analysis, that SCR is warranted as BART. In its Proposed Rule, EPA plainly stated that it believed technologies other than SCR could not significantly improve visibility at the 16 Class I areas surrounding San Juan and that it therefore "did not further evaluate them." 76 Fed. Reg. at 502.

[11]*See* 74 Fed. Reg. 2392 (Jan. 15, 2009) (making finding of failure to submit regional haze SIPs for several States, including New Mexico, and noting that the deadline for regional haze BART FIP promulgation for those States is January 15, 2011.)

establishing a schedule for either promulgation of a BART FIP or approval of a BART SIP for New Mexico. The only reason that EPA was bound to act on the interstate transport provisions by the specific date of August 5, 2011, was that a court had entered a decree establishing such a deadline for *that* action and that action only. Contrary to EPA's reasoning, the existence of the *WildEarth Guardians* consent decree highlights the fact that no judicially mandated deadline existed with respect to EPA action on New Mexico regional haze requirements, including BART for San Juan. In short, EPA has, at best, misconstrued its legal obligation to act under section 169A; EPA should have, but failed to, take the time needed to review and approve the New Mexico BART SIP submission.

EPA's error in this regard has had and will continue to have serious consequences. As stated in the Final Rule, EPA based its decision to decline to evaluate the merits of New Mexico's July 5, 2011 BART SIP submission on the Agency's view that it was bound to act, under *both* section 110(a)(2)(D)(i)(II) and section 169A, by the August 5, 2011 consent decree deadline that applies solely to section 110(a)(2)(D)(i)(II) requirements. 76 Fed. Reg. at 52415-16, 52423; *see also* Complete Response to Comments ("CRTC") Document at 91, 93. Similarly, EPA said that it failed to develop an algorithm to allow plantwide averaging for San Juan because, in EPA's view, the "consent decree deadline" did not provide it enough time to do so. *Id.* at 52405 (asserting that, "*due to our consent decree deadline*, we do not have the time to construct the algorithm that could be used to guarantee practical enforceability" of a plantwide average BART emission limit using boiler operating days) (emphasis added).

For all of these reasons, EPA failed to comply with the Act, and failed to recognize the rights of New Mexico under the regional haze program, based on the mistaken assertion that a consent decree compelled EPA's promulgation of the New Mexico BART FIP. Agency action premised on a mistaken conclusion that the agency has no discretion to exercise is inherently arbitrary and must be reconsidered based on a proper understanding of the agency's discretion. *See Prill v. NLRB*, 755 F.2d 941 (D.C. Cir. 1985). Accordingly, EPA should grant reconsideration of its Final Rule, stay that rule during reconsideration, and take prompt action to approve both New Mexico's 2007 SIP for interstate transport, as amended by the State's 2011 interstate transport SIP,[12] and New Mexico's July 5, 2011 regional haze SIP.

B. Submittal of New Mexico's Regional Haze State Implementation Plan Requires EPA To Withdraw Its FIP and Approve the State's Submission.

i. EPA Must Defer to the Discretion Afforded New Mexico Under the CAA to Make BART Determinations

[12]The next section of this petition addresses why EPA's disapproval of the 2007 interstate transport SIP must be reconsidered. Even apart from the grounds for reconsideration of that disapproval, EPA's disapproval is unsupported and unlawful for reasons explained in PNM's Request for Administrative Stay (at pages 12-13).

EPA's Final Rule acknowledges that the Agency received a regional haze SIP submission from the State of New Mexico on July 5, 2011, prior to EPA's promulgation of the Final Rule.[13] 76 Fed. Reg. at 52389. The Agency asserts, however, that it could not review the State's submission before it took final action on its FIP for San Juan because it was bound to take final action on its Proposed Rule by a consent decree entered in a case in the U.S. District Court for the Northern District of California[14] -- a position that, as explained above, is incorrect.

Because EPA was not obligated to act under section 169A of the CAA to promulgate a FIP addressing regional haze before undertaking a review of New Mexico's regional haze SIP submittal, EPA's Final Rule, including the BART determination for San Juan is, at best, premature. By proceeding prematurely with its Final Rule, EPA violated the CAA's requirement that states, not EPA, have the primary decision-making role in implementing the regional haze program, including the BART requirement. *See, e.g.*, CAA § 169A(b)(2)(A), (g)(2), 42 U.S.C. § 7491(b)(2)(A), (g)(2) (providing that the states, not EPA, are generally to determine which sources are subject to BART and to determine BART emission limits for those sources); 40 C.F.R. § 51.308(e) (same). The primacy of the states in this regard is a central feature of the CAA and was confirmed by the D.C. Circuit in *American Corn Growers Ass'n*, 291 F.3d at 8 (holding that key aspects of EPA's 1999 regional haze rules were "inconsistent with the Act's provisions giving the States broad authority over BART determinations"). Indeed, EPA's BART rules, as amended by EPA in 2005 in response to the *American Corn Growers* decision, essentially adopt the holding of *American Corn Growers* in its emphasis that states have broad discretion in setting BART. *See, e.g.*, 70 Fed. Reg. at 39105-06.

Deference to the State is especially warranted in this case, where the provisions of New Mexico's SIP submission differ in significant respects from those in EPA's FIP. These differences do not in any respect make New Mexico's SIP submission unapprovable, however. The State completed the full, five-factor analysis in evaluating BART for San Juan in accordance with EPA's BART Guidelines. The State's SIP, moreover, satisfies the presumptive BART limit for NOx emissions established by EPA's own BART Guidelines (0.23 lb/mmBtu for the boiler and coal type at San Juan). In addition, the SIP would impose an emission rate more stringent than the assumed rates relied upon in the WRAP modeling. EPA has taken the position that WRAP modeling rates establish a target for any interstate transport emission limits that would comply with the visibility-related interstate transport requirement of CAA section

[13]Governor Martinez's SIP Submittal letter, dated June 24, 2011, is attached to this petition as Exhibit B, and the BART Determination for San Juan (Appendix D to the SIP) is attached to this petition as Exhibit C.

[14]*See* 76 Fed. Reg. at 52423 ("Although we . . . received the New Mexico submittal on July 5, 2011, we simply have arrived at a point where we do not have the time to stop our action, review that SIP, propose a rulemaking, take and address public comment, and promulgate a final action as defined in the consent decree.").

110(a)(2)(D)(i)(II) for San Juan (*i.e.*, the 0.27 and 0.28 lb/mmBtu rates used by WRAP, as described by EPA, as compared to the 0.23 lb/mmBtu rate in the SIP). *See* 76 Fed. Reg. at 497. Because the State's submitted SIP is *more* stringent than EPA has claimed is necessary under § 110(a)(2)(D), EPA was required to approve the SIP submission as satisfying the State's interstate transport obligations and should have proceeded to evaluate the BART determination in the SIP under the regional haze rule. With respect to BART, the SIP reflects the State's weighing of the BART consideration factors -- a weighing that EPA must defer to and approve.

EPA's Final Rule ignores the deference on BART decision-making that must be accorded the State. Indeed, EPA in the Final Rule is improperly dismissive of the SIP, characterizing the State's determination as a mere "recommendation for BART determinations." 76 Fed. Reg. at 52393. EPA also states that it "will review the State RH SIP submittal, and if there is significant new information that changes our analysis, we will make appropriate revisions to today's decision." *Id.* at 52394. This statement demonstrates that EPA views *its own* BART determination as requiring deference, and believes that the State must carry the burden of persuading EPA that the State's alternative "recommendation" is acceptable and should be approved in lieu of the BART determination contained in EPA's Final Rule.

This is not the law. EPA's position is exactly backwards. EPA's BART determination is not entitled to a presumption of correctness; to the contrary, the Agency is obligated under the law to review the State's determination and analysis in light of the broad discretion that the CAA gives the states to determine BART. After that review, EPA is *required to approve* any SIP revision that satisfies the requirements of CAA section 110 -- in this case, the BART visibility requirements. *See Train v. NRDC*, 421 U.S. 60, 98 (1975) (EPA must approve SIPs that comply with section 110's minimum requirements)

EPA simply misunderstands its role. For instance, the Final Rule observes that

> the State RH [regional haze] SIP recommends SNCR as BART, and we have considered that technology in the context of responding to other comments in this notice. For the reasons discussed in our proposal (76 FR 491), and in other responses to comments, we have concluded that BART for the SJGS is an emission limit of 0.05 lbs/MMBtu, based on a 30 BOD [boiler operating day] average, more stringent than the levels achievable by the SNCR technology recommended by the State.

Id. This statement suggests that EPA has prejudged that the State's regional haze SIP cannot be approved because it reaches a conclusion that is different from EPA's position. But again, the

opposite consequence -- that EPA's policy determination must give way to the State's -- is the proper one.

ii. Deference To New Mexico's BART Determination Is Especially Due Where That Determination Was Made In Conformity With EPA's Own Duly Promulgated BART Guidelines

In making its regional haze BART determination, New Mexico properly considered the five statutory factors, which are (1) the costs of compliance; (2) the energy and non-air quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. 42 U.S.C. § 7491(g)(2). All five factors were considered and weighed by New Mexico, with the BART determination ultimately driven principally by a balancing of factors 1 and 5 – costs and visibility improvement. New Mexico's consideration and weighing of these factors was not only reasonable, it was fully compliant with the BART Guidelines.

With respect to cost, EPA provided in the BART Guidelines presumptive cost thresholds for reducing NOx emissions from coal-fired units greater than 200 MW and located at power plants greater than 750 MW (i.e., those similar to SJGS). EPA's analysis demonstrates that controls within the cost effectiveness range provided by EPA "are likely to be among the most cost-effective controls available for any source subject to BART, and that they are likely to result in a significant degree of visibility improvement." 70 Fed. Reg. at 39,131. The BART Guidelines conclude that technologies costing less than $1,500 per ton of NOx removed are generally highly cost-effective and result in a significant degree of visibility improvement. *Id.* at 39,135.

New Mexico's analysis of the cost of installing SNCR at all four units determined that it would cost an average of $3,494/ton of NOx removed (assuming NOx emissions would be reduced by 4,900 tons per year). By way of comparison, SCR would cost $7,057/ton. Because the costs of both SNCR and SCR exceed EPA's cost-effective range, New Mexico's selection of the less costly technology was compliant with the BART Guidelines and a policy judgment for New Mexico to make.

If anything, the cost of SNCR suggests that even *that* technology (let alone SCR) may not be justified given EPA's BART Guidelines. EPA's BART Guidelines also stress the importance of considering the "incremental" cost of a technology. *Id.* at 39,127. Put simply, an incremental cost is how much extra one pays for the additional emissions reductions obtained by the higher-cost controls. New Mexico's consideration of this element of the cost analysis is set forth in a chart summarizing the incremental costs of various control technologies found on page 17 of the

State's BART analysis. New Mexico observed, for example, that SCR technologies have an incremental cost of over $8,000/ton compared to SNCR. Thus, while SCR may remove more NOx than SNCR, it clearly is not a better economic value due to the very high incremental cost of the extra NOx removed over what SNCR would remove. New Mexico took this into account in determining that SNCR constitutes BART. The weight given to this factor was for New Mexico to resolve, and EPA has no lawful basis to second-guess that judgment.

Finally with respect to cost, New Mexico noted in its BART determination that according to the U.S. Census Bureau, 18% of New Mexicans were living below the poverty line in 2009 (versus the national average of 14.3% in 2009). New Mexico found credible PNM's estimate submitted to the State, and included in PNM's comments to EPA, that installing SNCR would result in a rate increase of $10.93 per year per residential ratepayer, while installing SCR would result in an increase of $85.31 per year for individual residential ratepayers. New Mexico concluded that the extra cost of SCR (and the resulting additional adverse economic impact on low-income citizens) was not justified given that SNCR satisfied EPA's presumptive requirements. EPA's BART Guidelines are clear that states may properly select BART based upon "unusual circumstances," *Id.* at 39,171, and New Mexico properly determined that the adverse economic impact on its disadvantaged populations is such a circumstance.

With respect to the degree of improvement in visibility that may reasonably be anticipated to result from the use of the technology, New Mexico noted that San Juan's emissions have the most significant impact on the Mesa Verde National Park, where modeling indicated that San Juan's baseline impact in 2001-2003 was, at most, 3.80 deciviews ("dv"). This impact did not account for the emission reductions resulting from the environmental upgrades at San Juan that were installed between 2006 and 2009. New Mexico concluded that SNCR would result in a maximum improvement of .22 dv in Mesa Verde. In comparison, the modeling had shown that SCR would only result in a maximum 1.34 dv improvement in Mesa Verde. The difference between the two – slightly more than 1 dv – is at the minimum threshold for what might be detectable to the human eye. 62 Fed. Reg. 41,145 (July 31, 1997). New Mexico's determination that this barely perceptible improvement did not justify the increased costs and increased impacts on low-income citizens is soundly within the discretion afforded the State by the Act. Again, this policy judgment was exercised by New Mexico consistent with the CAA and EPA's regulations and is not for EPA to second-guess.

iii. EPA's Failure to Consider New Mexico's BART Determination Resulted in Violations of CAA §§ 307(d) and 110

The unlawfulness of EPA's action is further confirmed by the requirements of section 307(d)(1)(B) & (6) of the CAA, 42 U.S.C. § 7607(d)(1)(B) & (6). Those provisions establish certain procedural obligations that the Agency must satisfy before it may promulgate a FIP. Of

critical importance here is the requirement in CAA section 307(d)(6) that the "statement of basis and purpose" that must accompany each final FIP rule must include, among other things, a summary of "the factual data on which the . . . rule is based" and "the major legal interpretations and policy considerations underlying the . . . rule." CAA section 307(d)(3)(A), (C), 42 U.S.C. § 7607(d)(3)(A), (C) (to which section 307(d)(6) refers). EPA cannot credibly claim to be able to present the relevant factual, legal, and policy information and rationale necessary to justify its final FIP as required by these statutory provisions *before* it has: (1) examined the State's submitted regional haze SIP, including its BART determination for San Juan; (2) determined whether and to what extent the New Mexico SIP is approvable or, in the alternative, may be deficient and unapprovable; and (3) provided the public with an adequate explanation of any such determination. Given the pendency of the State's SIP, and the absence of any reason to believe it is not approvable -- and, as discussed above, ample reason to conclude it *is* approvable -- it is not only improvident for EPA at this time to promulgate a FIP displacing state discretion; it is also impermissible under section 307(d) of the CAA.

Finally, EPA must recognize that, notwithstanding its promulgation of a FIP, it has a nondiscretionary duty under the Act to review and take final action on the State's regional haze SIP, including its BART determination. Section 110(k)(1) and (2) of the Act, 42 U.S.C. § 7410(k)(1) & (2), require EPA to promulgate final approval (or disapproval) of the SIP by no later than 18 months after EPA's receipt of the SIP. Any final action must be preceded by EPA publication of proposed action for public comment. 5 U.S.C. § 553.

Under CAA section 110, EPA must approve a SIP when it meets the requirements of section 110, even if that SIP relaxes previous requirements or is less stringent than a FIP that is in place. Indeed, in the case of the CAA's visibility program, the D.C. Circuit and EPA's own rules stress the broad discretion afforded to the states in weighing the various BART factors, a level of discretion that certainly provides ample authority to establish limits less stringent than SCR, as New Mexico's SIP does. *See Train v. NRDC*, 421 U.S. at 98; *American Corn Growers Ass'n*, 291 F.3d at 5-9 (D.C. Cir. 2002) (discussing states' broad discretion in making BART determinations); *New York v. Reilly*, 969 F.2d 1147, 1150 (D.C. Cir. 1992) (describing discretion as to the weight to be given consideration factors); *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1045-47 (D.C. Cir. 1978) (same).

Because the July 5, 2011 SIP revision establishes a BART determination based on SNCR as opposed to the far more expensive SCR required by EPA's Final Rule, EPA must assess the approvability of the SIP before promulgation of an inconsistent FIP. As discussed in PNM's September 16, 2011 administrative stay request, and supported by declarations attached thereto, compliance with EPA's Final Rule will necessitate undertaking enormously costly actions *in the near term* to design, engineer, procure, fabricate, and install the SCR equipment. The expenditures necessary for the owners of San Juan to undertake compliance with EPA's FIP

would prove to be wasted if EPA approves, as it must, the State's BART determination in its SIP submission. Accordingly, EPA should promptly grant reconsideration of the Final Rule to allow time to conduct and complete its CAA-required review of and rulemaking on approval of the SIP, and should stay the FIP rule during the pendency of its SIP review and SIP-approval rulemaking.

C. EPA's Assertion that New Mexico's 2007 Interstate Transport SIP Is Inconsistent with the Agency's 2006 Guidance to States Is Incorrect.

In 1997, EPA promulgated new NAAQS for ozone and $PM_{2.5}$, triggering a requirement under section 110(a)(1) of the CAA that each state revise its SIP to address "implementation, maintenance, and enforcement" of the new NAAQS "within such State." CAA § 110(a)(1), 42 U.S.C. § 7410(a)(1). In a guidance document issued on August 15, 2006, EPA directed states to address the requirements of section 110(a)(2)(D)(i) concerning interstate transport when revising their interstate transport SIPs to account for the revised ozone and $PM_{2.5}$ NAAQS. EPA provided guidance to the states on how to implement the provisions of section 110(a)(2)(D)(i)(II). EPA, Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Section 110(a)(2)(D)(i) for the 8-Hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards, at 9 (Aug. 15, 2006), available at http://www.epa.gov/ttn/oarpg/t1/memoranda/section110a2di_sip_guidance.pdf (hereinafter "Guidance Document").

EPA's Guidance Document placed adoption of regional haze SIPs addressing BART and other visibility requirements ahead of interstate transport SIPs. According to the Guidance Document,

> it is currently premature to determine whether or not State SIPs for 8-hour ozone or $PM_{2.5}$ contain adequate provisions to prohibit emissions that interfere with measures in other States' SIPs designed to address regional haze. Accordingly, EPA believes that States may make a simple SIP submission confirming that it is not possible at this time to assess whether there is any interference with measures in the applicable SIP for another State designed to "protect visibility" for the 8-hour ozone and $PM_{2.5}$ NAAQS *until regional haze SIPs are submitted and approved.*

Id. at 9-10 (emphasis added). On September 17, 2007, EPA received New Mexico's interstate transport SIP. That SIP submission complied with EPA's 2006 Guidance Document, as the Agency acknowledged in its Proposed Rule for New Mexico. *See* 76 Fed. Reg. 491, 494 (Jan. 5, 2011).

i. EPA Unlawfully Failed To Provide Public Notice of Its Claim that New Mexico's 2007 Interstate Transport SIP Was Inconsistent with the 2006 Guidance Document, and That Claim Is Factually Incorrect

In its Final Rule, EPA takes an entirely new position -- a position never stated or even suggested in its Proposed Rule on which the public commented. Now, for the first time in the Final Rule, EPA concludes that the State's "submission was not factually consistent with the recommendations of the [EPA 2006] guidance," and implies that timely submission to EPA of an approvable *regional haze SIP* is a prerequisite to compliance with the Guidance Document on *interstate transport*. 76 Fed. Reg. at 52418. Had EPA provided notice of this position in its Proposed Rule, New Mexico and other commenters would have had the opportunity to point out to EPA that the timing of the State's submission of a regional haze SIP should have no bearing on any determination as to whether the State's 2007 interstate transport SIP satisfies EPA's Guidance Document. The State's 2007 submission of its interstate transport SIP triggered an EPA obligation to review and take action on that submission at that point in time. CAA § 110(k)(1)(B) & (2) (requiring final EPA action on any submitted SIP no later than 18 months after the SIP submission). EPA failed to take that action, missing its own deadline for approving (or disapproving) New Mexico's interstate transport SIP. A finding that New Mexico's interstate transport SIP was consistent with EPA's 2006 Guidance Document and approvable was, and remains, the proper course of action.[15]

ii. EPA Unlawfully Failed To Provide Notice of Its Repudiation of Its 2006 Guidance Document, and That Repudiation Was Arbitrary and Capricious

Not only does EPA incorrectly conclude that New Mexico's 2007 interstate transport SIP was inconsistent with EPA's 2006 Guidance Document, the Agency's Final Rule goes so far as to disavow -- again, without any public notice or opportunity for comment -- SIP revisions that satisfy the Guidance Document, at least with respect to New Mexico. The Guidance Document was premised on the finding that, prior to submission to, and approval by, EPA, of regional haze SIPs by states potentially contributing to interstate visibility impairment, it would not be "possible to assess whether emissions from sources in the state would interfere with measures in the SIPs of other states." 76 Fed. Reg. at 52418 (quoting Guidance Document). EPA argues that because submission of regional haze SIPs has been delayed or because SIP submissions have not

[15]New Mexico's 2011 submission of a revision to its interstate transport SIP does not alter this analysis. On the contrary, that submission further confirms that New Mexico is relying on its regional haze SIP to satisfy any interstate transport-related visibility requirements, consistent with EPA's 2006 Guidance Document. *See* New Mexico State Implementation Plan Revision To Satisfy the Requirements of Clean Air Act 110(a)(2)(D)(i)(II) with Respect to Visibility for the 8-Hour Ozone and $PM_{2.5}$ NAAQS Promulgated in July 1997, available at http://www.nmenv.state.nm.us/aqb/documents/110a2d_SIP_SO2_NOx_SJGS.pdf.

met applicable regional haze program requirements, it is no longer "appropriate to await submission and [EPA] approval of such RH SIPs before evaluating [interstate transport] SIPs for compliance with section 110(a)(2)(D)(i)(II)." *Id.* Thus, EPA now announces in the Final Rule that its guidance to states on this matter "was in error." *Id.*

EPA is mistaken. The failure of many states to timely submit regional haze SIPs simply magnifies the problem being addressed in the Guidance Document: the inability to quantify interstate interference until all contributing states have developed visibility SIPs and those SIPs have been approved by EPA. In other words, it is just as speculative and inappropriate to undertake any final interstate-transport SIP assessment today, in the absence of submitted *and EPA-approved* regional haze SIPs, as it was in 2006 when EPA rightly recognized that such assessment would be premature. Indeed, even though most states have submitted regional haze SIPs, EPA has failed to take final action to approve more than a handful of them. The clear and logical intent of the 2006 Guidance Document was to allow any section 110(a)(2)(D)(i)(II) interstate transport obligation to act in effect as a "placeholder" and later to be subsumed by each state's regional haze program in its regional haze SIP. That remains the appropriate course today, and EPA's assertion that New Mexico's 2007 interstate transport SIP "was not factually consistent" with the Guidance Document, 76 Fed. Reg. at 52418, is unfounded. Accordingly, the action EPA should have taken was approval of New Mexico's 2007 interstate transport SIP, review of New Mexico's regional haze SIP upon its submission by the State, and only then, if necessary, rulemaking action to develop a regional haze FIP if the SIP is unapprovable. EPA plainly could have and should have approved the 2007 interstate transport SIP.[16]

In its Proposed Rule, EPA tried to justify its proposal to disapprove New Mexico's 2007 interstate transport SIP because "[t]o date, the state has not made a RH SIP submission." 76 Fed. Reg. at 494. That SIP submission has now been made, and in fact, was made before the promulgation of the Final Rule. Under these circumstances, EPA's action on the San Juan BART determination is especially unwarranted. New Mexico's SIP submission is approvable; even under EPA's own interpretation of the State's section 110(a)(2)(D)(i)(II) visibility obligation, that SIP will satisfy any such obligation the State may have. New Mexico's 2007 proposed interstate transport SIP, in conformity with EPA's 2006 Guidance Document, deferred establishment of substantive visibility-related controls to the regional haze SIP. Prior to the Agency's Final Rule, EPA provided no notification that the Guidance was "in error" and that a different SIP revision was required.

In light of EPA's disregard of its procedural obligation under CAA section 307(d) to provide public notice and an opportunity to comment on this critical underpinning of EPA's

[16]Such an action would have discharged EPA's obligation under the *WildEarth Guardians* consent decree with respect to the New Mexico interstate transport visibility SIP.

Final Rule, EPA should grant reconsideration and a stay of the rule. On reconsideration, EPA should determine that New Mexico acted consistently with the 2006 Guidance Document and should either give final approval to New Mexico's 2007 interstate transport SIP, or approve New Mexico's July 5, 2011 regional haze SIP as satisfying both interstate transport and BART visibility requirements.

III. Conclusion

For all of the foregoing reasons, EPA should grant this petition for reconsideration. Moreover, EPA should stay the effectiveness of the Final Rule pending EPA's reconsideration in accordance with this petition under the CAA and the PNM Request for Administrative Stay. Finally, EPA should comply with the statutes and case law, as well as its own regulations, and immediately docket a proceeding to consider the approval the SIPs that were submitted by the State of New Mexico.

Respectfully Submitted,

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DAVE MARTIN
Secretary

RAJ SOLOMON, P.E.
Deputy Secretary

March 21, 2011

Dr. Alfredo Armendariz
Regional Administrator
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Email: Armendariz.al@epa.gov

Re: Proposed Federal Implementation Plan; Docket No. EPA-R06-OAR-2010-0846

Dear Administrator Armendariz:

As you are aware, last month the New Mexico Environment Department (NMED) filed two petitions with the New Mexico Environmental Improvement Board (Board) for the adoption of state implementation plans (SIPs) for New Mexico relating to the Regional Haze and Interstate Transport programs under the federal Clean Air Act. On March 15, the Board voted unanimously to proceed to hearing on these SIP petitions. The hearing will be conducted June 6 through 8, 2011.

These SIP petitions are critically important to the citizens of New Mexico. They will have an impact on the state's economy and affect approximately one million consumers of electricity in our state. We strongly believe that the state has a vital role to play in the both the development and administration of the plans that will dictate how New Mexico achieves the goals under the Clean Air Act.

New Mexico previously submitted an Interstate Transport SIP for approval by the Environmental Protection Agency (EPA) in 2007. The EPA did not take any action on this SIP until it issued its proposed federal implementation plan (FIP) in this docket on January 5, 2011. The EPA now proposes to disapprove the New Mexico Interstate Transport SIP and to assume administration over the Interstate Transport and Regional Haze programs. We do not believe that the Clean Air Act intended such a result. To the contrary, the Clean Air Act encourages administration of air programs by the states.

Exhibit A

New Mexico is rapidly and deliberately moving forward with these two SIPs, which together, present an integrated strategy to comply with the requirements under the Interstate Transport rule and the Regional Haze rule. We believe that it is incumbent upon the EPA to afford New Mexico a fair opportunity to present these SIPs for full consideration and action by the EPA. As you may know, the previous administration in New Mexico withdrew their draft SIP just prior to the new administration taking office. Considerable work needed to be done relative to the current SIP submission as well as the formation of a new Environmental Improvement Board to consider the SIP. In order to allow New Mexico to present its final SIPs for EPA consideration, we request that the EPA delay further action on its proposed FIP pending submittal of the final SIPs. Alternatively, we request that the EPA extend the public comment deadline in this docket to allow New Mexico to present its final SIPs in the context of this proceeding.

We understand that the EPA is under a consent decree deadline for issuance of a final Interstate Transport FIP or SIP by June 21, 2011. However, because of these important developments relating to New Mexico's proposed SIP we respectfully request that the EPA grant us a 90-day extension of time under the consent decree to allow the state to proceed as outlined above.

We appreciate your consideration in this matter. I am sending my Deputy Secretary Raj Solomon to your office on March 22, when representatives of PNM meet to discuss our request for extension and due consideration of our SIP. Please let me know if we can provide any additional information to assist in this request.

Sincerely,

F. David Martin

Secretary F. David Martin
New Mexico Environment Department

cc The Honorable Susana Martinez, Governor
Honorable Gary King, Attorney General
Ms. Deborah Peacock, Chairperson, New Mexico Environmental Improvement Board
Gina McCarthy, Assistant Administrator for the Office of Air & Radiation, EPA Headquarters
Raj Solomon, P.E., Deputy Secretary, NM Environment Department

State of New Mexico

Susana Martinez
Governor
June 24, 2011

Dr. Alfredo Armendariz
Regional Administrator (6-A)
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Dear Dr. Armendariz:

On behalf of the New Mexico Environment Department, I am pleased to submit to the Environmental Protection Agency the enclosed revisions to the New Mexico State Implementation Plan (SIP). These revisions include amendments to New Mexico's Regional Haze SIP under 40 CFR § 51.309.

The hearing record for all of the SIP revisions is attached, which includes the revised SIP, filed regulations, transcripts, exhibits, public notices, affidavits of publication, the notice of intent to present technical testimony, and public comments.

Included with the attached hardcopy of the hearing record is an electronic copy of the record provided on disk which I certify to be an exact duplicate of the hardcopy.

These SIP revisions satisfy the requirements of the Clean Air Act, comply with EPA regulations and policy, and will result in significant emission reductions while preserving the proper federal-state partnership envisioned under the Clean Air Act. As such, EPA must approve these revisions. In addition, because the enclosed SIP revisions address two different provisions of the federal Clean Air Act, I believe EPA should address them separately.

First, the enclosed "Interstate Transport SIP" addresses Section 110 of the Act, which requires states to avoid interfering with any other states' implementation plans for visibility. As made clear in the Interstate Transport SIP submitted in 2007, and further explained in two letters to EPA Region 6 from the previous New Mexico administration (one from Governor Richardson on June 12, 2009 and another from a member of his staff on May 6, 2010), New Mexico has already satisfied its Interstate Transport obligations. However, the enclosed Interstate Transport SIP supplements those previous submittals by confirming that the emissions from New Mexico sources will not exceed the assumptions utilized in the modeling conducted by the Western Regional Air Partnership (WRAP), upon which other western states' visibility plans are based.

Exhibit B

State Capitol • Room 400 • Santa Fe, New Mexico 87501 • 505-476-2200 • fax: 505-476-2226

EPA has already recognized that "the analysis conducted by the WRAP provides an appropriate means for designing a [plan] that will ensure that emissions from sources in New Mexico are not interfering with the visibility programs of other states." In fact, the enclosed Interstate Transport SIP confirms that emissions will actually be much lower than the WRAP modeling assumptions.

Second, the enclosed revisions to the 2003 "Regional Haze Section 309 SIP" and the enclosed "Regional Haze Section 309(g) SIP" (together, the "Regional Haze SIPs") address New Mexico's obligation to reduce visibility impairment at national parks and wilderness areas ("Class I areas") in accordance with Sections 169A & 169B of the Clean Air Act. The Regional Haze SIPs satisfy New Mexico's regional haze requirements by adopting new sulfur dioxide (SO_2) milestones for the Section 309 Backstop Trading Program, establishing reasonable progress goals and a long-term strategy for New Mexico's nine Class I areas, and adopting a variety of control measures to address emissions of visibility impairing pollutants from New Mexico sources. Most notably, the enclosed Regional Haze SIP also includes a Best Available Retrofit Technology (BART) determination for the San Juan Generating Station, which requires the installation of a Selective Non-Catalytic Reduction (SNCR) system to meet EPA's presumptive BART limit for nitrogen oxides (NO_x).

I am aware that EPA has proposed a different plan for implementing the Interstate Transport program and at least a portion of the Regional Haze program in New Mexico through a combined Federal Implementation Plan (FIP). I am also aware of EPA's concern that it is bound by a court order to complete that rulemaking effort by August 5, 2011. However, the court order imposing the August 5, 2011 deadline only requires EPA to address Interstate Transport requirements before that date. In addition, the proposed FIP suffers from a variety of legal and technical flaws and inappropriately seeks to address only an isolated portion of the regional haze program. Under these circumstances, I believe EPA can and should address the Interstate Transport program and Regional Haze program separately. Doing so will enable EPA to address New Mexico's Interstate Transport requirements by the court-ordered deadline, while allowing additional time for review of the more lengthy and complicated Regional Haze SIPs.

One of the fundamental principles expressed in Section 101 of the Clean Air Act is that "air pollution control at its source is the primary responsibility of States and local governments." That principle is nowhere better illustrated in the Act than in its visibility provisions, which, as EPA and the courts have recognized, grant to the states significant discretion in the implementation of measures to address visibility impairment. In designing the regional haze program, Congress recognized that the individual states are best-equipped to balance the need for robust environmental protections with the costs those protections necessarily entail.

Moreover, nothing in the Clean Air Act requires EPA to address Interstate Transport and Regional Haze requirements together. On the contrary, EPA has generally addressed these programs separately in the past. As just one example, EPA Region 8 recently proposed to take separate action on the Interstate Transport and Regional Haze implementation plan revisions submitted by the state of Colorado. Even EPA's proposed FIP for New Mexico itself contemplates separate Interstate Transport and Regional Haze plans with regard to SO_2 emissions.

Accordingly, EPA should meet its August 5, 2011 deadline by simply approving New Mexico's prior Interstate Transport submittals, as supplemented by the enclosed Interstate Transport SIP. Even if EPA does not agree that New Mexico's prior submittals have already satisfied its Interstate Transport obligations, EPA should be able to act on New Mexico's four-page Interstate Transport SIP before August 5, 2011.

Since the court order does not require EPA to address New Mexico's Regional Haze program by August 5, 2011, New Mexico is now, as of this submittal, in the same position as nearly every other state – awaiting EPA action on its Regional Haze SIP. As with other states, EPA must determine whether New Mexico's Regional Haze SIPs are complete no more than six months from this date and, following that completeness determination or the expiration of six months, EPA must act to approve or disapprove those SIPs within twelve months, including time allowed for public notice and comment on the proposed action. Because EPA will be required to consider New Mexico's Regional Haze SIPs regardless of whether it finalizes the proposed FIP, EPA should take no action on its proposed FIP, particularly since the August 5, 2011 deadline does not apply to regional haze. At a minimum, EPA should reopen the docket on the proposed FIP for at least ninety (90) days to accept further comment in light of the submission of these SIP revisions.

I hope you will begin an immediate, expedited review and approval of the enclosed SIP revisions and, as recommended above, take separate action on the separate Interstate Transport and Regional Haze requirements of the Clean Air Act.

If there are any questions concerning this SIP submittal, please contact Raj Solomon at (505) 827-2855.

Sincerely,

Susana Martinez
Governor

Enclosures

cc: Guy Donaldson, EPA Region 6
Dave Martin, NMED Cabinet Secretary
Raj Solomon, NMED Deputy Cabinet Secretary

Appendix D

New Mexico BART Determination for San Juan Generating Station

Exhibit C

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Governor

JOHN A. SANCHEZ
Lieutenant Governor

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DAVE MARTIN
Secretary

RAJ SOLOMON, PE
Deputy Secretary

New Mexico Environment Department
Air Quality Bureau
BART Determination

Public Service Company of New Mexico
San Juan Generating Station, Units 1-4

February 28, 2011

Regulatory Background and Introduction:

In 1999, the EPA published a final rule to address a type of visibility impairment known as regional haze (64 FR 35714, July 1, 1999). This rule requires States to submit state implementation plans (SIPs) to address regional haze visibility impairment in 156 Federally-protected parks and wilderness areas. The 1999 rule was issued to fulfill a long-standing EPA commitment to address regional haze under the authority and requirements of sections 169A and 169B of the Clean Air Act (CAA).[1]

As required by the CAA, the EPA included in the final regional haze rule a requirement for Best Available Retrofit Technology (BART) for certain large stationary sources. The regulatory requirements for BART were codified at 40 CFR 50.308(e) and in definitions that appear in 40 CFR 50.301.

The BART-eligible sources are those sources which (1) have the potential to emit 250 tons per year or more of a visibility impairing air pollutant, (2) were put in place between August 7, 1962 and August 7, 1977, (3) and whose operations fall within one or more of 26 specifically listed source categories. Under the CAA, BART is required for any BART-eligible source which a State determines "emits any air pollutant which may reasonably be anticipated to cause or contribute to any impairment of visibility in any such area." Accordingly, for stationary sources meeting these criteria, States must address the BART requirement when they develop their regional haze SIPs. [1]

The EPA published a second Regional Haze rulemaking on June 6, 2005 that made changes to the Final Rule published July 1, 1999. This second rulemaking was in response to a U.S. District Court of Appeals ruling that vacated part of the regional haze rule. The June 6, 2005 Final Rule (1) required the BART analysis to include an analysis of the degree of visibility improvement resulting from the use of control technology at BART-subject sources; (2) revised the BART provisions; (3) included new BART Guidelines contained in a new Appendix Y to Part 51 (Guidelines); and (4) added the requirement that States use the Guidelines for determining BART at certain large electrical generating units (EGUs). [1]

The Guidelines also contained specific presumptive limits for SO_2 and NOx for certain large EGUs based on fuel type, unit size, cost effectiveness, and presence or absence of pre-existing controls. For NOx emissions, the EPA directs states to generally require owners and operators to meet the presumptive limits at coal-fired EGUs greater than 200 MW with a total facility-wide generating capacity greater than 750 MW. The presumptive limits for NOx are based on coal type, boiler type and whether SCR or SNCR are already installed at the source.

Analysis of BART Eligible Sources in NM:

In May 2006, the New Mexico Environment Department, Air Quality Bureau (Department) conducted an internal review of sources potentially subject to the BART rule.

Section II of the Guidelines prescribes how to identify BART-eligible sources. States are required to identify those sources that satisfy the following criteria: (1) sources that fall within the 26 listed source categories as listed in the CAA, (2) sources that were "in existence" on August 7, 1977 but were not "in operation" before August 7, 1962, and (3) sources that have a current potential to emit that is greater than 250 tons per year of any single visibility impairing pollutant. New Mexico identified 11 sources as BART-eligible sources as part of this review.[2]

The Guidelines then prescribe to the states how to identify those sources that are subject to BART. At this point, states are directed to either (1) make BART determinations for all BART-eligible sources, or (2) to

consider exempting some of the sources from BART because they may not reasonably be anticipated to cause or contribute to any visibility impairment in a Class I area. New Mexico opted to perform an initial screening model on each of these BART-eligible sources to determine whether each source did cause or contribute to any visibility impairment. The Guidelines direct States that if the analysis shows that an individual source or group of sources is not reasonably anticipated to cause or contribute to any visibility impairment in a Class I area, then the States do not need to make a BART determination for that source or group of sources. [1]

The Western Regional Air Partnership (WRAP) performed the initial BART modeling for the state of New Mexico. The procedures used are outlined in the WRAP Regional Modeling Center (RMC) BART Modeling Protocol that is available at:

http://pah.cert.ucr.edu/aqm/308/bart/WRAP_RMC_BART_Protocol_Aug15_2006.pdf

The basic assumptions in the WRAP BART CALMET/CALPUFF modeling used for New Mexico are as follows:

i. Use of three years of modeling of 2001, 2002, and 2003.
ii. Visibility impacts due to emissions of SO_2, NOx and primary PM emissions were calculated. PM emissions were modeled as $PM_{2.5}$.
iii. Visibility was calculated using the Original IMPROVE equation and Annual Average Natural Conditions.

Initial modeling was performed for the 11 source complexes in New Mexico with visibility estimated from the sources' SO_2, NOx, and PM emissions. Then for those sources whose 98th percentile visibility impacts at any Class I area due to their combined SO_2, NOx, and PM emissions exceeded the 0.5 dv significance threshold, the separate contribution to visibility at Class 1 areas was assessed for SO_2 alone (SO_4), NOx alone (NO_3), PM alone (PMF) and combined NOx plus PM emissions (NO_3 + PMF).[2]

Of the 11 source complexes analyzed, only one source complex's visibility impacts at any Class I area due to combined SO_2, NOx, and PM emissions exceeded the 0.5 dv threshold (PNM San Juan Generating Station Boilers #1-4). Of the 10 other source complexes, none exceed a 0.33 dv impact. Consequently, only the PNM San Juan Boilers #1-4 were evaluated for visibility impacts.[2]

On November 9, 2006, the Department informed PNM that the modeling performed by the WRAP indicated the visibility impairment from the San Juan Generating Station (SJGS) was over the 0.5 dv threshold, and was therefore subject to a BART analysis. In response, Black & Veatch (B&V), on behalf of PNM, submitted the BART Modeling Protocol document which described the CALPUFF modeling methodology to be used as part of the BART engineering evaluation for Units 1-4 at the SJGS.

SJGS Source Description:

The SJGS consists of four coal-fired generating units and associated support facilities. Each coal-fired unit burns pulverized coal and No. 2 diesel oil (for startup) in a boiler and produces high-pressure steam which powers a steam turbine coupled with an electric generator. Electric power produced by the units is supplied to the electric power grid for sale. Coal for the units is supplied by the adjacent San Juan Mine and is delivered to the facility by conveyor.

The SJGS Boiler Units 1 and 2 have a unit capacity of 350 and 360 MW, respectively. The units are equipped with Foster Wheeler subcritical, wall-fired boilers that operate in a forced draft mode. The SJGS

Boiler Units 3 and 4 each have a unit capacity of 544 MW and are equipped with a B&W subcritical, opposed wall-fired boilers that operate in a forced draft mode.

Consent Decree:

On March 5, 2005, PNM entered into a consent decree with the Grand Canyon Trust, the Sierra Club, and the Department to settle alleged violations of the CAA. The consent decree required PNM to meet a PM average emission rate of 0.015 pounds per million British thermal units (lb/MMBtu) (measured using EPA Reference Method 5), and a 0.30 lb/MMBtu emission rate for NOx (daily rolling, thirty day average), for each of Units 1, 2, 3, and 4. As a result, PNM has installed new Low NOx burners (LNB) with overfire air (OFA) ports and a neural network (NN) system to reduce NOx emissions, and pulse jet fabric filters (PJFF) to reduce the PM emissions (See Table 1).

Table.1: SJGS Characteristics

SJGS Characteristics				
Unit	**SJGS 1**	**SJGS 2**	**SJGS 3**	**SJGS 4**
Fuel Type	Sub-bituminous	Sub-bituminous	Sub-bituminous	Sub-bituminous
HHV of Fuel (btu/lb)	9692	9692	9692	9692
Unit Rating, MW (gross)	360	350	544	544
Boiler Heat Input (Mbtu/hr)	3707	3688	5758	5649
Type of Boiler	Wall-fired	Wall-fired	Opposed Wall-fired	Opposed Wall-fired
Steam Cycle	Subcritical	Subcritical	Subcritical	Subcritical
Draft of Boiler	Forced	Forced	Forced	Forced
Existing Emissions Controls				
PM	PJFF	PJFF	PJFF	PJFF
SO_2	Wet FGD	Wet FGD	Wet FGD	Wet FGD
NOx	LNB/OFA/NN	LNB/OFA/NN	LNB/OFA/NN	LNB/OFA/NN

BART Analysis Overview:

Per 40 CFR 51.308 *Regional haze program requirements*, the determination of BART must be based on an analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each BART-eligible source that is subject to BART within the State. In this analysis, the State must take into consideration each available technology, the associated costs of compliance of each, the energy and non-air quality environmental impacts of compliance, any pollution control equipment in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology.[1]

The determination of BART for fossil-fuel power plants having a total generating capacity in excess of 750 megawatts must be made pursuant to the Guidelines.[1]

PNM's BART Analysis for NOx and PM:

PNM submitted the BART analysis for the SJGS to the Department on June 6, 2007. The BART analysis was performed in two stages. First, a BART analysis was performed for the consent decree technologies being implemented at the SJGS. In the second stage of the BART analysis, additional control technology alternatives to the consent decree technologies were identified and evaluated. To determine the visibility improvements from both the consent decree technology upgrades and additional control technology, the Department determined it was appropriate to review both pre-consent decree to consent decree visibility improvement and improvement projected from consent decree plus additional control technologies.

Per Appendix Y to 40 CFR Part 51 – Guidelines, PNM followed the 5 Step Process in the SJGS BART Analysis:

Step 1 – Identify All Available Retrofit Control Technologies
Step 2 – Eliminate Technically Infeasible Options
Step 3 – Evaluate Control Effectiveness of Remaining Control Technologies
Step 4 – Evaluate Impacts and Document the Results
- a) Costs of Compliance
- b) Energy Impacts
- c) Air quality environmental impacts
- d) Non-air environmental impacts
- e) Remaining useful life

Step 5 – Evaluate Visibility Impacts

In response to the Department's requests, PNM has submitted multiple amendments to the original June 2007 BART Analysis application. What follows is a summary of the original and additional submittals:

June 6, 2007
The original BART analysis application included a five factor analysis of NOx technology. Modeling analyses were performed to provide SJGS plant-wide regional haze visibility impacts at 16 Class I areas. These analyses were based on a constant 1 ppb background ammonia concentration and no nitrate repartitioning. The NOx control technologies analyzed were the Selective Catalytic Reduction (SCR) and SNCR/SCR Hybrid.[3]

November 6, 2007
Modeling analyses were performed to provide SJGS plant-wide regional haze visibility impacts at 16 Class I areas. The analysis was based on refinements which included using the nitrate repartitioning methodology and monthly variable background ammonia concentrations. Again, the NOx control technologies analyzed were the SCR and SNCR/SCR Hybrid.[3]

March 29, 2008
PNM submitted an additional discussion of cost estimation methods used to determine costs of SCR installation and a discussion of Nalco Mobotec ROFA and Rotamix technology.[3]

March 31, 2008
Two modeling analyses were performed to provide SJGS plant-wide and unit specific regional haze visibility impacts at 16 Class I areas for the SCR NOx control technology only. One of the analyses, believed by PNM to be the more representative of ammonia chemistry of the area, was based on the November 6, 2007 refinements which included using nitrate repartitioning methodology and monthly

variable background ammonia concentrations. The other analysis included nitrate repartitioning and a constant background ammonia concentration as requested by the Department.[3]

May 30, 2008

Two modeling analyses were performed to provide SJGS plant-wide and unit specific regional haze visibility impacts at 16 Class I areas for the SNCR NOx control technology only. Similar to the March 31, 2008 analyses, one of the analyses was based on the November 6, 2007 refinements which included using nitrate repartitioning methodology and monthly variable background ammonia concentrations. The other analysis used nitrate repartitioning methodology and constant background ammonia concentration. It should be noted that PNM modeled all variants of SNCR together (including Fuel Tech and Nalco Mobotec) as one technology called SNCR. This is the same approach that is used for modeling SCR control technology, where all variants are modeled generically as SCR.[3]

At the request of the Department, PNM and B&V also provided a five-factor BART analysis for SNCR technology and a discussion of coal characteristics of the coal burned at the SJGS.

August 29, 2008

Three modeling analyses were performed to provide SJGS plant-wide and unit specific regional haze visibility impacts at 16 Class I areas for the ROFA with Rotamix, Rotamix, ROFA, and WESP PM control technologies (the NOx and PM analyses were submitted separately). Similar to the May 30, 2008 analyses, these analyses were also based on the November 6, 2007 refinements which included using the nitrate repartitioning methodology and monthly variable background ammonia concentrations.[3]

At the request of the Department, PNM and B&V also provided a five-factor BART analysis of Nalco Mobotec control technology, including ROFA, Rotamix and ROFA/Rotamix and a five-factor BART analysis of additional PM control technology.[3]

March 16, 2009

Four modeling analyses were performed to provide SJGS plant-wide and unit specific regional haze visibility impacts at 16 Class I areas. These include SCR technology, SCR/SNCR Hybrid technology; SCR technology with sorbent injection; and SCR/SNCR Hybrid technology with sorbent injection. As requested by the Department, for each of these cases, the modeling also took into consideration inherent SO_3 removal of the SO_3 formed from the catalyst oxidation of SO_2 to SO_3.[3]

February 15, 2011

A revised analysis of SNCR technology was submitted after PNM received a lower vendor-guaranteed emission rate from Fuel Tech, a vendor of SNCR technology. The analysis also included updated cost estimates for SCR, SNCR/SCR Hybrid, ROFA/Rotamix, Rotamix (SNCR), ROFA, and SNCR (Fuel Tech) technologies. The Department did not review the updated cost analyses for these control technologies and does not necessarily agree with the new cost-estimates supplied in the analysis.

The submittal further included a ratepayer impact analysis which estimated the cost impact to residential ratepayers from installation of SNCR and SCR technologies.

One modeling analysis was performed to provide SJGS plant-wide and unit specific regional haze visibility impacts at 16 Class I areas assuming the revised SNCR control technology on all four units.[3]

Step 1 of the BART Analysis: Identification of All Available Retrofit Emissions Control Technologies

NOx Control Technologies

The main strategies for reducing NOx emissions take two forms: 1) modification to the combustion process to control fuel and air mixing and reduce flame temperatures, and 2) post-combustion treatment of the flue gas to remove NOx. PNM and B&V identified the following available NOx control technologies and a discussion of each of the technologies:

1) Low NOx Burners, Overfire Air, and Neural Network

   Low NOx burners slow and control the rate of fuel and air mixing, thereby reducing the oxygen availability in the ignition and main combustion zones. Overfire Air uses low excess air levels in the primary combustion zone with the remaining (overfire) air added higher in the furnace to complete combustion. Neural Network provides improvements in the heat rate and reduce combustion-related emissions by fine-tuning the combustion process.[3]

2) Selective Non Catalytic Reduction (SNCR)

   SNCR is based on the chemical reduction of the NO molecule into molecular nitrogen and water vapor. A nitrogen based reducing agent (reagent), such as ammonia or urea, is injected into the post combustion flue gas. The reduction with NO is favored over other chemical reaction processes at temperatures ranging between 1600F and 2100F (870C to 1150C), therefore, it is considered a selective chemical process.[4]

3) Selective Catalytic Reduction (SCR)

   The SCR process chemically reduces the NO molecule into molecular nitrogen and water vapor in the presence of a reducing catalyst. A nitrogen based reducing reagent such as ammonia or urea is injected into the ductwork, downstream of the combustion unit. The waste gas mixes with the reagent and enters a reactor module containing catalyst. The hot flue gas and reagent diffuse through the catalyst. The reagent reacts selectively with the NO within a specific temperature range and in the presence of the catalyst and excess oxygen.[5]

   SCR plus Sorbent Injection

   Sorbent injection removes SO_3 in the flue gas by reaction of the SO_3 with an alkaline sorbent material to form a particulate that is subsequently removed in a particulate control device. The alkaline material injected can be a magnesium, sodium, or calcium-based sorbent. The injection points for the reagents may vary. For this analysis, hydrated lime was selected.[4]

4) SNCR/SCR Hybrid

   The SNCR/SCR hybrid systems use components and operating characteristics of both SNCR and SCR systems. Hybrid systems were developed to combine the low capital cost and high ammonia slip associated with SNCR systems with the high reduction potential and low ammonia slip inherent in the catalyst of SCR systems.[3]

SNCR/SCR Hybrid plus Sorbent Injection

Sorbent injection removes SO_3 in the flue gas by reaction of the SO_3 with an alkaline sorbent material to form a particulate that is subsequently removed in a particulate control device. The alkaline material injected can be a magnesium, sodium, or calcium-based sorbent. The injection points for the reagents may vary. For this analysis, hydrated lime was selected.[4]

5) Gas Reburn

The gas reburn process combusts auxiliary natural gas, along with coal, in the boiler. Three separate combustion zones in the boiler are manipulated to reduce NOx emissions.[4]

6) Nalco Mobotec ROFA and Rotamix

ROFA and Rotamix are proprietary control technologies developed by Nalco Mobotec. ROFA, or Rotating Opposed Firing Air, is a modified overfire air technology that utilizes rotation of flue gases and turbulent mixing to reduce NOx emissions. Rotamix is a version of SNCR technology and operates under the same principles as other SNCR technology.[3]

7) NOxStar

NOxStar is the trademarked name for a NOx control technology that involves the injection of ammonia and a hydrocarbon (typically natural gas) into the flue gas path of a coal-fired boiler at around 1600F to 1800F for the reduction of NOx.[3]

8) ECOTUBE

The ECOTUBE system utilizes retractable lance tubes that penetrate the boiler above the primary combustion burner zone and inject high-velocity air as well as reagents. The lance tubes work to create turbulent airflow and to increase the residence time for the air/fuel mixture. In principle, the OFA and SNCR processes are combined in this technology.[3]

9) PowerSpan ECO

The PowerSpan ECO system is a multi-pollutant technology with limited experience. The PowerSpan 5ECO system is located downstream of an existing particulate control device and treats the power plant's flue gas in three process steps to achieve multi-pollutant removal of sulfur dioxide (SO_2), nitrogen oxides (NOx), oxidized mercury, and fine particulate matter.[3]

10) Phenix Clean Combustion

Phenix Clean Combustion System is an advanced hybrid coal gasification/combustion process that prevents the formation of NOx and SO_2 emissions when burning coal.[3]

11) e-SCRUB

The e-SCRUB process is similar to the PowerSpan technology in that it uses an energy source to oxidize pollutants in the flue gas. However, there are some variations in the oxidation energy source and the byproduct recovery systems.

PM Control Technologies

Particulate matter emissions can only be controlled by post-combustion control technologies. PNM identified the following technologies as available in their BART analysis for PM.

1) Flue Gas Conditioning with Hot-Side ESP

   Flue gas conditioning improves the collection efficiency of particulate matter in the ESP. Flue gas leaving the air heater into the ESP can be conditioned by addition of ionic compounds, such as SO_3 or ammonia. These compounds combine with the moisture in the flue gas and are deposited on the surface of the fly ash particles. This will increase the conductivity of the fly ash and make it more suitable for capture.[3]

2) Pulse Jet Fabric Filter (PJFF)

   In PJFFs, the flue gas typically enters the compartment hopper and passes from the outside of the bag to the inside of the bag, depositing particulate on the outside of the bag. To prevent collapse of the bag, a metal cage is installed on the inside of the bag. The flue gas passes up through the center of the bag into the output plenum. Cleaning is performed by initiating a downward pulse of air into the top of the bag. The pulse causes a ripple effect along the length of the bag. This releases the dust cake from the bag's exterior surface, allowing the dust to fall into the hopper.[3]

3) Compact Hybrid Particulate Collector

   A variant of the PJFF is the compact hybrid particulate collector. This is a high air to cloth (A/C) ratio fabric filter installed downstream of existing particulate collection devices where the majority of PM has been removed.[3]

4) Max-9 Electrostatic Fabric Filter

   The Max-9 filter is essentially a high-efficiency PJFF utilizing a discharge electrode as in an ESP. However, there are no collector plates. When the dust particles are charged, they are attracted to the grounded metal cage inside the filter element, just as they would be attracted to the collecting plates in an ordinary precipitator.[3]

Step 2 of the BART Analysis: Eliminate Technically Infeasible Control Technologies

NOx Control Technologies

PNM excluded several of the identified NOx controls due to technical infeasibility. In the BART analysis application, PNM excluded the following NOx control technologies:

1) Selective Non Catalytic Reduction

   PNM determined in its submittal of June 6, 2007 that SNCR technology was technically infeasible because the technology was unable to meet the presumptive limits for NOx; determined by EPA to be 0.23 lb NOx/MMBtu for dry bottom, wall-fired boilers burning sub-bituminous coal. A vendor estimated that the technology could only achieve 0.24 lb NOx/MMBtu. In order for the technology to achieve the presumptive limit, PNM stated that ammonia slip limit would

need to be raised from 5 ppm to 10 ppm, and that this higher ammonia slip posed additional operational problems.

The Department did not agree with PNM's argument that because SNCR could not meet the presumptive limits the technology should be eliminated as technically infeasible. Therefore the Department requested PNM to perform the complete 5-factor BART analysis required by the Guidelines on SNCR. PNM submitted the five-factor analysis of SNCR in a subsequent submittal dated May 30, 2008, and an updated analysis of Fuel Tech's SNCR on February 11, 2011.

2) Natural Gas Reburn

PNM determined that the current boiler space inhibits sufficient residence time for the natural gas reburn zone. The Department accepts PNM's elimination of this technology due to space limitations.

3) NalcoMobotec ROFA and Rotamix

PNM determined the Rotamix technology was technically infeasible due to limited application at coal-fired boilers equivalent to the size of Units 1-4 at SJGS. PNM determined ROFA technology was technically infeasible because ROFA is a variant of OFA, which at the time was being installed at Units 1-4 at SJGS.

The Department did not agree with PNM's position that Rotamix has limited application at coal-fired boilers equivalent the size of Units 1-4 at SJGS. The Department did not agree that because ROFA is a variant of OFA, the technology can be eliminated as technically infeasible. Therefore the Department requested PNM perform the complete 5-factor analysis for ROFA and Rotamix. PNM performed the analysis and submitted the analysis in two subsequent submittals dated March 29, 2008 and August 29, 2008.

4) NOxStar

NOxStar currently has only one major installation in the US. In addition, PNM stated that in recent discussions the supplier has identified limited ability and willingness to market the commercial technology. The Department agrees that this technology has limited application to large coal-fired boilers and is not technically feasible.

5) ECOTUBE

The ECOTUBE technology has been demonstrated on industrial/small boilers firing sold waste, wood, and biomass.[3] ECOTUBE has limited application to boilers similar to Units 1-4 at the SJGS. The Department agrees that this technology has limited application to large coal-fired boilers and is not technically feasible.

6) PowerSpan

PowerSpan has not been demonstrated on large boilers, such as Units 1-4 at SJGS. The Department agrees that this technology has limited application to large coal-fired boilers and is not technically feasible.

7) Phenix Clean Combustion

PNM determined that the Phenix Clean Combustion system is still in the demonstration and testing stage, and there are no commercial retrofits at facilities similar to SJGS. The Department agrees that this technology has no demonstrated application to the source type and is not technically feasible.

8) e-SCRUB

PNM determined that the e-SCRUB technology has only one known medium scale installation with limited data. The Department agrees that the technology should be considered technically infeasible due to limited demonstrated applications.

PM Control Technologies

PNM excluded the following PM control technologies as technically infeasible:

1) Flue Gas Conditioning with Hot-Side ESP

Flue gas conditioning does improve collection efficiencies, but will not achieve an emission limit lower than the current PM limit in their air quality permit. The Department agrees that flue gas conditioning control technology should not be considered in the BART analysis. Because the vendor was unable to guarantee a lower emission rate, the technology does not need to undergo the three additional factors of the five factor analysis.

2) Compact Hybrid Particulate Collector

The compact hybrid particulate collector does not provide a performance guarantee lower than the current permitted limit for PM. The Department agrees that the compact hybrid PM control technology should not be considered in the BART analysis. Because the vendor was unable to guarantee a lower emission rate, the technology does not need to undergo the three additional factors of the five factor analysis.

3) Max-9 Electrostatic Fabric Filter

The Max-9 electrostatic fabric filter has been installed in a small-sized utility boiler, but there are no commercial installations of a similar size to Units 1-4 at SJGS. The Department agrees that the limited application of this technology to large utility boilers justifies removing the technology as technically infeasible.

During the Department review of available PM control technologies, the Department requested PNM to perform a complete five-factor BART analysis on Wet Electrostatic Precipitator (WESP). The Department believes this technology should have been identified as technically feasible in Step 1 of the PM BART analysis. PNM performed a complete five-factor BART analysis on WESP and PJFF and submitted report in a subsequent submittal dated August 28, 2008.

Step 3 of the BART Analysis: Evaluate Control Effectiveness of Remaining Control Technologies

PNM contracted with B&V to determine the control effectiveness of each remaining available NOx and PM control technology for Units 1-4. The control efficiencies of each of the NOx control technologies are

summarized in Tables 2 – 5, and the control efficiencies of the PM control technologies are summarized in Tables 6 – 9.

Table 2: **NOx** Control Effectiveness for Unit 1

Control Technology	Control Efficiency (%)	Baseline Emissions (tpy)	Emissions Reduction (tpy)	Controlled Emission Rate (lb/MMBtu)	Controlled Emission Rate (tpy)
Pre-Consent Decree (Pre-CD)	NA	NA	NA	0.43	5394
CD	23	5394	1254	0.30	4140
ROFA	13	4140	552	0.26	3588
Rotamix (SNCR)	23	4140	966	0.23	3174
SNCR	23	4140	966	0.23	3174
ROFA/Rotamix	33	4140	1380	0.20	2760
SCR/SNCR Hybrid	40	4140	1656	0.18	2484
SCR + Sorbent	77	4140	3174	0.07	966

Table 3: **NOx** Control Effectiveness for Unit 2

Control Technology	Control Efficiency (%)	Baseline Emissions (tpy)	Emissions Reduction (tpy)	Controlled Emission Rate (lb/MMBtu)	Controlled Emission Rate (tpy)
Pre-Consent Decree (Pre-CD)	NA	NA	NA	0.45	6179
CD	33	6179	2060	0.30	4119
ROFA	13	4119	549	0.26	3570
Rotamix (SNCR)	23	4119	961	0.23	3158
SNCR	23	4119	961	0.23	3158
ROFA/Rotamix	33	4119	1373	0.20	2746
SCR/SNCR Hybrid	40	4119	1648	0.18	2471
SCR + Sorbent	77	4119	3158	0.07	961

Table 4: **NOx** Control Effectiveness for Unit 3

Control Technology	Control Efficiency (%)	Baseline Emissions (tpy)	Emissions Reduction (tpy)	Controlled Emission Rate (lb/MMBtu)	Controlled Emission Rate (tpy)
Pre-Consent Decree (Pre-CD)	NA	NA	NA	0.42	9004
CD	29	9004	2573	0.30	6431
ROFA	13	6431	857	0.26	5574
Rotamix (SNCR)	23	6431	1500	0.23	4931
SNCR	23	6431	1500	0.23	4931
ROFA/Rotamix	33	6431	2144	0.20	4287
SCR/SNCR Hybrid	40	6431	2572	0.18	3859
SCR + Sorbent	77	6431	4930	0.07	1501

Table 5: **NOx** Control Effectiveness for Unit 4

Control Technology	Control Efficiency (%)	Baseline Emissions (tpy)	Emissions Reduction (tpy)	Controlled Emission Rate (lb/MMBtu)	Controlled Emission Rate (tpy)
Pre-Consent Decree (Pre-CD)	NA	NA	NA	0.42	8833
CD	29	8833	2524	0.30	6309
ROFA	15	6309	841	0.26	5468

Rotamix (SNCR)	23	6309	1472	0.23	4837
SNCR	23	6309	1472	0.23	4837
ROFA/Rotamix	33	6309	2103	0.20	4206
SCR/SNCR Hybrid	40	6309	2524	0.18	3786
SCR + Sorbent	77	6309	4837	0.07	1472

Table 6: **PM** Control Effectiveness for Unit 1

Control Technology	Control Efficiency (%)	Baseline Emissions (tpy)	Emissions Reduction (tpy)	Controlled Emission Rate (lb/MMBtu)	Controlled Emission Rate (tpy)
Pre-Consent Decree (Pre-CD)	NA	NA	NA	0.050	690
PJFF (CD)	70	690	483	0.015	207
WESP	33	207	69	0.010	138

Table 7: **PM** Control Effectiveness for Unit 2

Control Technology	Control Efficiency (%)	Baseline Emissions (tpy)	Emissions Reduction (tpy)	Controlled Emission Rate (lb/MMBtu)	Controlled Emission Rate (tpy)
Pre-Consent Decree (Pre-CD)	NA	NA	NA	0.050	687
PJFF (CD)	70	687	481	0.015	206
WESP	33	206	69	0.010	137

Table 8: **PM** Control Effectiveness for Unit 3

Control Technology	Control Efficiency (%)	Baseline Emissions (tpy)	Emissions Reduction (tpy)	Controlled Emission Rate (lb/MMBtu)	Controlled Emission Rate (tpy)
Pre-Consent Decree (Pre-CD)	NA	NA	NA	0.050	1072
PJFF (CD)	70	1072	750	0.015	322
WESP	33	322	108	0.010	214

Table 9: **PM** Control Effectiveness for Unit 4

Control Technology	Control Efficiency (%)	Baseline Emissions (tpy)	Emissions Reduction (tpy)	Controlled Emission Rate (lb/MMBtu)	Controlled Emission Rate (tpy)
Pre-Consent Decree (Pre-CD)	NA	NA	NA	0.050	1052
PJFF (CD)	70	1052	737	0.015	315
WESP	33	315	105	0.010	210

Step 4 of the BART Analysis: Perform Impacts Analysis of Remaining Control Technologies

The Guidelines require states to consider four types of impact analysis in Step 4 of the BART analysis. These four types of impacts consider the costs of compliance, energy impacts, non-air quality environmental impacts, and remaining useful life of the facility. These impacts are included in the cost-effectiveness of each additional control technology and allow comparisons to be made between the remaining controls. B&V performed an impact analysis for the remaining NOx and PM control technologies in accordance with the Guidelines.

B&V prepared the design parameters and developed estimates of capital and annual costs for applications of SCR, SCR/SNCR Hybrid, ROFA, Rotamix, ROFA/Rotamix, PJFF, and WESP technologies. B&V relied on a number of sources to prepare the design parameters, including information from the Nalco Mobotec equipment vendors, EPA cost manuals, engineering and performance data, and B&V's own in-house engineering estimates.

PNM evaluated the energy impacts, non-air quality environmental impacts, and remaining useful life of all additional technically feasible control options for NOx and PM. Energy impacts from control equipment that consume auxiliary power during operation were considered for all control options. For SCR and SCR/SNCR Hybrid technology, the non-air quality environmental impacts included the consideration of water usage and waste generated from each control technology. For WESP technology, PNM considered the auxiliary power consumption to operate the WESP and fans, and the additional water consumption and waste water disposal requirements from operating the WESP. Lastly, the remaining useful life was defined as 20 years. Therefore, no additional cost adjustments for a short remaining useful boiler life need to be considered. The results of the impact analyses for additional NOx and PM control technologies are summarized in Tables 10 and 11 on the following pages.

Following the initial submittal, the Department made additional requests for information on the impact analysis for SCR, SNCR, ROFA, Rotamix and WESP, and for further consideration of inherent and additional control of SO_3 from both the SCR and SCR/SNCR Hybrid technology.

SCR Costs

The Department reviewed the original cost analysis for SCR technology and subsequently requested PNM to provide additional information on the basis of their cost analysis of SCR technology. In response to the request, B&V provided additional clarification for the cost analysis for SCR technology and submitted it to the Department on March 29, 2008. The submittal discussed how the OAQPS cost control manual is an insufficient method for determining actual costs of retrofitting the SJGS with SCR and provided a comparison between cost estimation based on the OAQPS manual and the B&V provided estimate.

Consideration of SO_3 Control

PNM's initial analysis of SCR and SCR/SNCR technology took into consideration additional oxidation of SO_2 to SO_3 across the SCR catalyst bed. The Department requested PNM to consider inherent removal of SO_3 emissions from existing air pollution control equipment, and removal of SO_3 emissions through installation of sorbent injection. PNM responded with an amended submittal addressing both inherent and add-on removal of SO_3. PNM's submittal provided cost estimates of the sorbent injection system and updated visibility modeling for both SCR and SCR/SNCR Hybrid technologies.

The Department understands that there are SCR catalysts now on the market that are capable of a much smaller SO_2 to SO_3 conversion (around 0.5%) as opposed to the assumed 1%. The Department believes use of such a catalyst will minimize SO_3 oxidation to less than what was represented in PNM's analysis.

SNCR, WESP, ROFA, and Rotamix Review

PNM provided additional impact analyses of SNCR, WESP, ROFA, and Rotamix technologies and submitted those updates to the Department.

Table 10: Impact Analysis and Cost Effectiveness of Additional NOx Control Technologies

Control Technology	Emission Performance Level (lb/MMBtu)	Expected Emission Rate (tpy)	Expected Emission Reduction (tpy)	Total Capital Investment (TCI) (1,000$)	Total Annualized Cost (TAC) (1,000$)	Cost Effectiveness ($/ton)	Incremental Cost Effectiveness ($/ton)	Energy Impacts (1,000$)	Non-Air Impacts (1,000$)
Unit 1									
SCR + sorbent	0.07	966	3,174	192,070	21,998	6,931	3,815	1,496	NA[1]
SNCR/SCR Hybrid	0.18	2,484	1,656	110,683	16,816	10,154	35,917	706	1,762
ROFA/Rotamix	0.20	2,760	1,380	30,790	6,902	5,001	7,982	1,413	3
Rotamix (SNCR)	0.23	3,174	966	11,822	3,597	3,723	116	51	4
SNCR	0.23	3174	966	17,048	3,582	3,708	80	36	NA[1]
ROFA	0.26	3,588	552	19,256	3,549	6,429	--	1,363	NA[1]
Consent Decree	0.30	4,140	1,254	14,580	1,422	1,134	NA	NA[1]	NA[1]
Pre-CD	0.43	5,394	NA	NA	NA	NA	NA	NA	NA[1]
Unit 2									
SCR + sorbent	0.07	961	3,158	206,717	23,364	7,398	4,431	1,565	NA[1]
SNCR/SCR Hybrid	0.18	2,471	1,648	115,151	17,306	10,503	37,887	346	1,762
ROFA/Rotamix	0.20	2,746	1,373	30,790	6,902	5,027	8,024	1,413	3
Rotamix (SNCR)	0.23	3,158	961	11,822	3,597	3,742	117	51	4
SNCR	0.23	3,158	961	17,048	3,582	3,727	80	36	NA[1]
ROFA	0.26	3,570	549	19,256	3,549	6,462	--	1,363	NA[1]
Consent Decree	0.30	4,119	2,060	14,126	1,378	669	NA	NA[1]	NA[1]
Pre-CD	0.45	6,179	NA	NA	NA	NA	NA	NA	NA[1]
Unit 3									
SCR + sorbent	0.07	1,501	4,931	260,622	30,527	6,191	2,086	2,267	NA[1]
SNCR/SCR Hybrid	0.18	3,859	2,572	178,759	26,604	10,342	39,171	507	2,658
ROFA/Rotamix	0.20	4,287	2,144	35,724	9,810	4,576	7,498	2,810	5
Rotamix (SNCR)	0.23	4,931	1,501	13,919	4,988	3,324	-378	84	5
SNCR	0.23	4,931	1,501	21,220	4,859	3,238	-578	36	NA[1]
ROFA	0.26	5,574	857	22,081	5,231	6,100	--	2,725	NA[1]
Consent Decree	0.30	6,431	2,573	12,715	1,240	482	NA	NA[1]	NA[1]
Pre-CD	0.42	9,004	NA	NA	NA	NA	NA	NA	NA[1]
Unit 4									
SCR + sorbent	0.07	1,472	4,837	242,295	28,760	5,946	1,691	2,288	NA[1]
SNCR/SCR Hybrid	0.18	3,786	2,524	171,412	25,808	10,226	38,034	507	2,658
ROFA/Rotamix	0.20	4,206	2,103	35,724	9,810	4,664	7,643	2,810	5
Rotamix (SNCR)	0.23	4,837	1,472	13,919	4,988	3,388	-385	84	5
SNCR	0.23	4,837	1,472	21,220	4,859	3,301	-590	36	NA[1]
ROFA	0.26	5,468	841	22,081	5,231	6,218	--	2,725	NA[1]
Consent Decree	0.30	6,309	2,524	12,870	1,256	498	NA	NA[1]	NA[1]
Pre-CD	0.42	8,833	NA	NA	NA	NA	NA	NA	NA[1]

[1] PNM performed an impact analysis for these technologies and incorporated any monetized energy or non-air environmental impacts into the cost analysis.

Table 11: Impact Analysis and Cost Effectiveness of Additional PM Control Technologies

Control Technology	Emission Performance Level (lb/MMBtu)	Expected Emission Rate (tpy)	Expected Emission Reduction (tpy)	Total Capital Investment (TCI) (1,000$)	Total Annualized Cost (TAC) (1,000$)	Incremental Cost Effectiveness ($/ton)	Cost Effectiveness ($/ton)	Energy Impacts (1,000$)	Non-Air Impacts (1,000$)
Unit 1									
WESP	0.010	138	69	99,308	11,855	20,696	171,812	1,112	NA[1]
PJFF (CD)	0.015	207	483	67,072	10,427	NA	21,588	4,488	NA[1]
Pre-CD	0.050	690	NA	NA	NA	NA	NA	NA	NA
Unit 2									
WESP	0.010	137	70	99,663	11,895	16,157	169,929	1,112	NA[1]
PJFF (CD)	0.015	207	480	69,840	10,764	NA	22,425	4,488	NA[1]
Pre-CD	0.050	687	NA	NA	NA	NA	NA	NA	NA
Unit 3									
WESP	0.010	214	108	129,565	15,558	28,741	144,056	1,728	NA[1]
PJFF (CD)	0.015	322	750	72,696	12,454	NA	16,605	6,895	NA[1]
Pre-CD	0.050	1072	NA	NA	NA	NA	NA	NA	NA
Unit 4									
WESP	0.010	210	105	130,012	15,609	29,352	148,657	1,728	NA[1]
PJFF (CD)	0.015	315	737	73,328	12,527	NA	16,997	6,895	NA[1]
Pre-CD	0.050	1052	NA	NA	NA	NA	NA	NA	NA

[1] PNM performed an impact analysis for these technologies and incorporated any monetized energy or non-air environmental impacts into the cost analysis.

Step 5 of the BART Analysis: Visibility Impacts Analysis of Remaining Control Technologies

The Guidelines require states to assess visibility improvement based on the modeled change in visibility impacts for the pre-control and post-control emission scenarios.

The objective of this source-specific, refined modeling analysis report is to describe the methodologies and procedures of visibility modeling to support the BART engineering analysis for PNM's SJGS Units 1, 2, 3, and 4. These units were identified as subject-to-BART by the Department based on BART screening exemption modeling conducted by the Western Regional Air Partnership's (WRAP) Regional Modeling Center (RMC). Because of the results of the WRAP screening modeling, PNM SJGS was required to conduct a refined BART analysis that included CALPUFF visibility modeling for the facility.

The modeling approach followed the requirements described in the WRAP's BART modeling protocol, *CALMET/CALPUFF Protocol for BART Exemption Screening Analysis for Class I Areas in the Western United States dated August 15, 2006*. The refined modeling methodology is described in detail below.

CALPUFF System

The CALPUFF modeling system consists of a meteorological data pre-processor (CALMET), an air dispersion model (CALPUFF), and post-processor programs (POSTUTIL, CALSUM, CALPOST). The CALPUFF model was developed as a non-steady-state air quality modeling system for assessing the effects of time-varying and space-varying meteorological conditions on pollutant transport, transformation, and removal.

CALMET is a diagnostic wind model that develops hourly wind and temperature fields in a three-dimensional, gridded modeling domain. Meteorological inputs to CALMET can include surface and upper-air observations from multiple meteorological monitoring stations. Additionally, the CALMET model can utilize gridded analysis fields from various mesoscale models such as MM5 to better represent regional wind flows and complex terrain circulations. Associated two-dimensional fields such as mixing height, land use, and surface roughness are included in the input to CALMET. The CALMET model allows the user to "weight" various terrain influence parameters in the vertical and horizontal directions by defining the radius of influence for surface and upper-air stations.

CALPUFF is a multi-layer, Lagrangian puff dispersion model. CALPUFF can be driven by the three-dimensional wind fields developed by the CALMET model (refined mode), or by data from a single surface and upper-air station in a format consistent with the meteorological files used to drive steady-state dispersion models. All far-field modeling assessments described here were completed using the CALPUFF model in the refined mode.

CALSUM is a post-processing program that can operate on multiple CALPUFF output files to combine the results for further post-processing. POSTUTIL is a post-processing program that processes CALPUFF concentrations and wet/dry flux files. The POSTUTIL model operates on one or more output data files from CALPUFF to sum, scale, and/or computer species derived from those that are modeled, and outputs selected species to a file for further post-processing. CALPOST is a post-processing program that can read the CALPUFF (or POSTUTIL or CALSUM) output files and calculate the impacts to visibility.

All of the refined CALPUFF modeling was conducted with the version of the CALPUFF system recommended by the WRAP BART modeling protocol. Version designations of the key programs are listed in Table 12.

Table 12: CALPUFF System Used

Program	WRAP Protocol		PNM Analyses	
	Version	Level	Version	Level
CALMET	6.211	060414	6.211	060414
CALPUFF	6.112	060412	6.112	060412
POSTUTIL	N/A	N/A	1.52	060412
CALSUM	N/A	N/A	1.33	051122
CALPOST	6.131	060410	6.131	060410

Meteorological Data Processing (CALMET)

As required by the WRAP modeling protocol, the CALMET model was used to construct an initial three-dimensional windfield using data from the MM5 model. Surface and upper-air data were input to CALMET to adjust the initial windfields. Because the MM5 data were afforded to simulate atmospheric variables on the CALMET windfields, the daily MM5 meteorological data files provided by the WRAP RMC for the years 2001, 2002, and 2003 were utilized as input into CALMET. These variables were processed into the appropriate format and introduced into the CALMET model through the utilization of additional meteorological data files. Locations of the observations that were input to CALMET, including surface and precipitation stations, are shown in Figures 1 and 2. Default settings were used in the CALMET input files for most of the technical options. Table 13 lists the key user-defined CALMET settings that were selected.

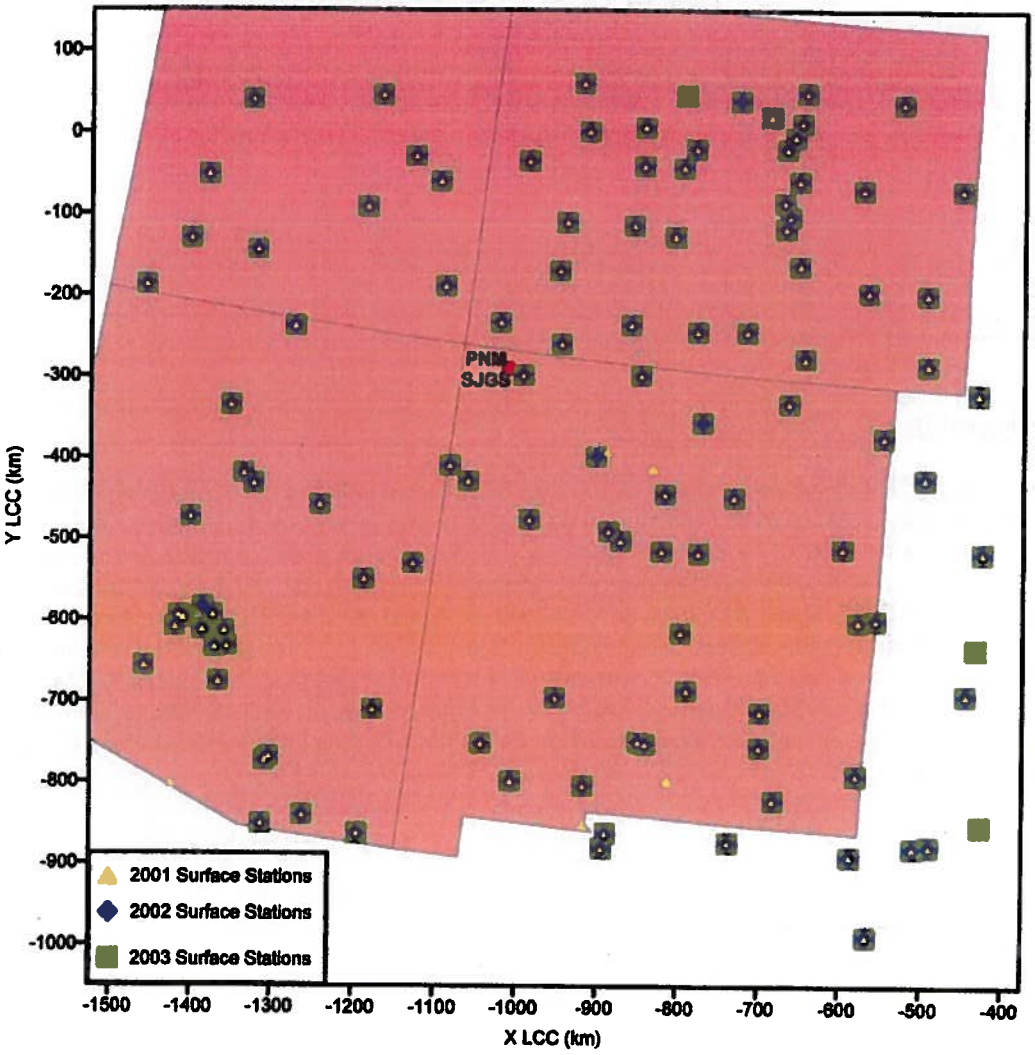

Figure 1: Surface Stations

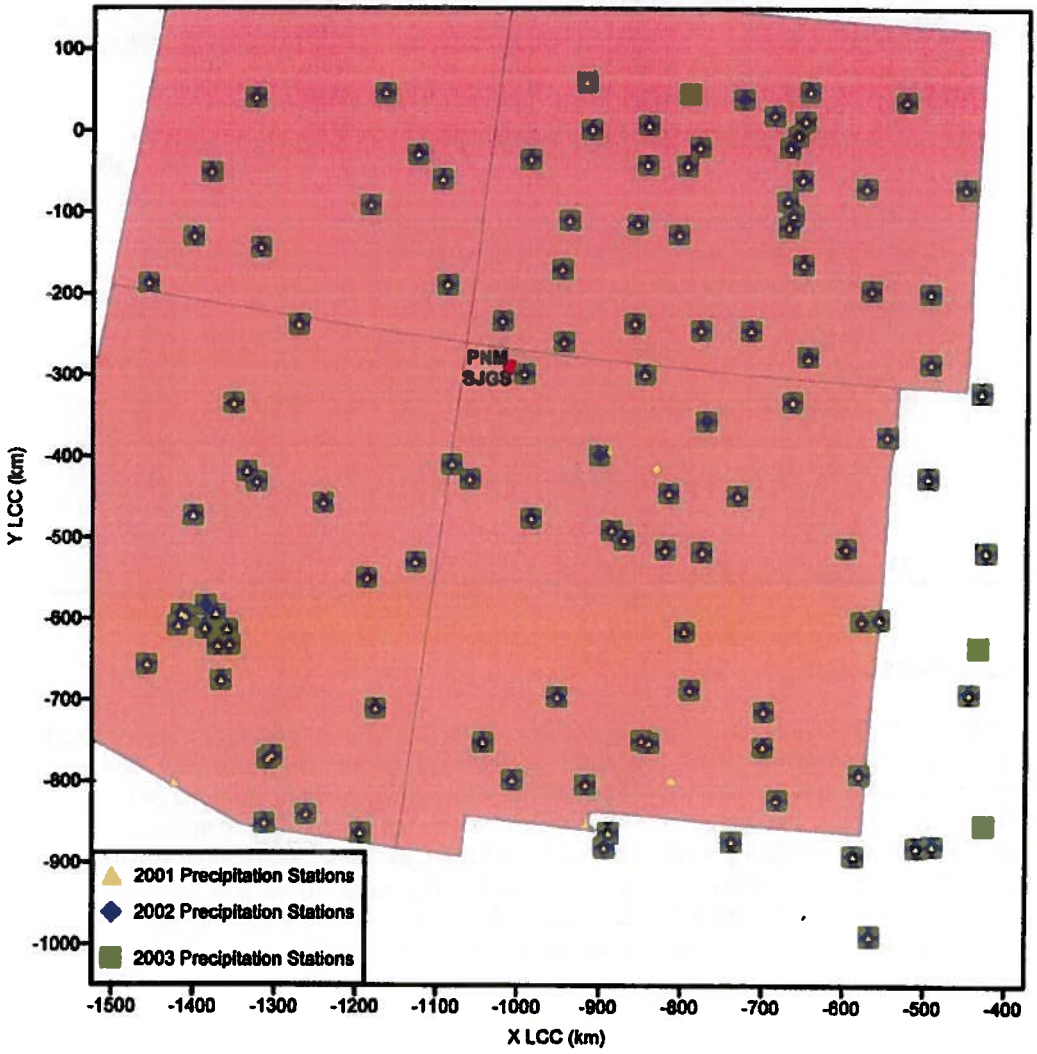

Figure 2: Precipitation Stations

Table 13: Key User-Defined CALMET Settings

Variable	Description	Value
PMAP	Map projection	LCC
DGRIDKM	Grid spacing (km)	4
NZ	Number of layers	10
ZFACE	Cell face heights (m)	0, 20, 100, 200, 350, 500, 750, 1000, 2000, 3000, 4000, 5000
NOOBS	1=Use of surface and precipitation (no upper air observations); use MM5 for upper air data	1
IEXTRP	Extrapolate surface wind obs to upper level	1
RMIN2	Minimum distance for extrapolation	4
IPROG	Use gridded prognostic model output	14
RMAX1	Maximum radius of influence (surface layer, km)	50
RMAX2	Maximum radius of influence (layers aloft, km)	100
TERRAD	Radius of influence for terrain (km)	10
R1	Relative weighting of first guess wind field and observation (km)	100
R2	Relative weighting aloft (km)	200
ITPROG	3D temperature from observations or from MM5	1

CALPUFF Modeling Setup

To allow chemical transformations within CALPUFF using the recommended chemistry mechanism (MESOPUFF II), the model required input of background ozone and ammonia concentrations. Background ozone concentrations are important for the photochemical conversion of SO_2 and NOx to SO_4 and NO_3, respectively. For ozone, the hourly ozone concentration files that were used by the WRAP RMC in the initial modeling were used for the BART technology evaluation. In addition to the hourly ozone data, the same monthly average background ozone value of 80 ppb that was used in the initial modeling was used in this modeling for times when hourly ozone data were not available. For ammonia, the monthly variable background ammonia concentrations were used for the BART modeling analysis. They are as follows:

Table 14: Ammonia Background Concentration (ppb)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.2	0.2	0.5	0.5	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.2

There are many Class I areas within and surrounding New Mexico. On the basis of distance from BART applicable sources, topography, and meteorology, the screening modeling conducted by WRAP RMC determined that 16 Class I areas needed to be addressed in the BART analysis. The applicable Class I areas included in the BART analysis are located within 300 km of the SJGS facility. As shown in Figure 3, the nearest Class I area is Mesa Verde National Park, located approximately 40 km north of the facility and the most distant Class I area is Grand Canyon National Park, located approximately 300 km of west of the facility. All Class I area distances from the facility fall within the range recommended for CALPUFF application. The 16 Class I areas are identified in Table 15 and an illustration of the receptors used in the modeling analysis for each Class I area is provided in Appendix B. The CALPUFF analyses

used an array of discrete receptors with receptor elevations for the Class I areas, which were created and distributed by the National Park Service (NPS).

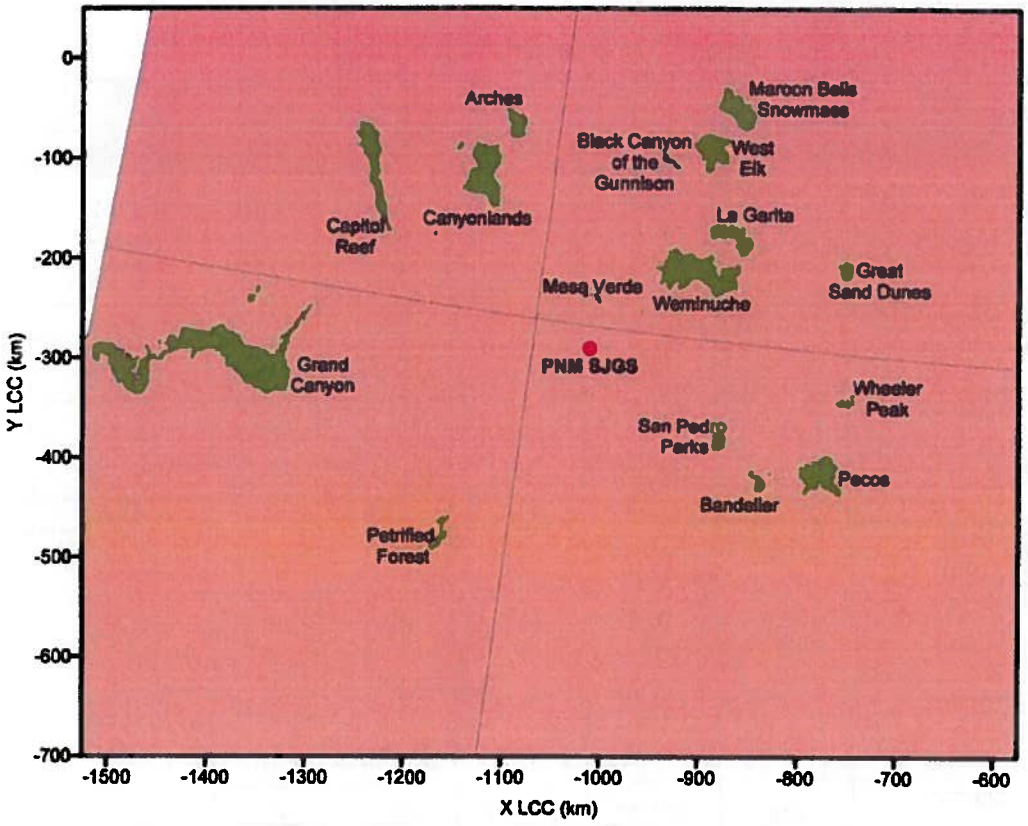

Figure 3: Location of SJGS and the Class I Area

Table 15: Class I Areas

1. Mesa Verde National Park (MEVE)	9. West Elk Wilderness (WEEL)
2. Weminuche Wilderness (WEMI)	10. Arches National Park (ARCH)
3. San Pedro Parks Wilderness (SAPE)	11. Capitol Reef National Park (CARE)
4. La Garita Wilderness (LAGA)	12. Pecos Wilderness (PECO)
5. Canyonlands National Park (CANY)	13. Wheeler Peak Wilderness (WHPE)
6. Black Canyon of the Gunnison National Park (BLCA)	14. Great Sand Dunes National Park (GRSA)
7. Bandelier National Monument (BAND)	15. Maroon Bells-Snowmass Wilderness (MABE)
8. Petrified Forest National Park (PEFO)	16. Grand Canyon National Park (GRCA)

CALPUFF Inputs – Pre-Consent Decree, Baseline and Control Options

Source release parameters and emissions for pre-consent decree, baseline and control options for each unit are shown in Tables 16 through 19.

Table 16: CALPUFF Inputs for Unit 1

Model Input Data	Pre-Consent Decree	Consent Decree	Rotamix or SNCR	ROFA/ Rotamix	ROFA	SCR/SNCR Hybrid	SCR with Sorbent
Hourly Heat Input (MMBtu/hour)	3707	3707	3707	3707	3707	3707	3707
Sulfur Dioxide (SO_2) (lb/MMBtu)	0.24	0.18	0.18	0.18	0.18	0.18	0.18
Sulfur Dioxide (SO_2) (lb/hr)	877.8	667.3	667.3	667.3	667.3	667.3	667.3
Nitrogen Oxide (NOx) (lb/MMBtu)	0.43	0.33	0.23	0.20	0.26	0.18	0.07
Nitrogen Oxide (NOx) (lb/hr)	1592.0	1223.3	852.6	741.4	963.8	667.3	259.5
PM (lb/MMBtu)	0.050	0.015	0.015	0.015	0.015	0.015	0.015
PM (lb/hr)	185.4	55.6	55.6	55.6	55.6	55.6	55.6
SO_3 as Sulfuric Acid (H_2SO_4) (lb/MMBtu)	0.013	0.011	0.011	0.011	0.011	0.031	0.004
SO_3 as Sulfuric Acid (H_2SO_4)[a] (lb/hr)	50.0	40.5	40.5	40.5	40.5	114.2	16.1
Stack Conditions							
Stack Height (meters)	121.92	121.92	121.92	121.92	121.92	121.92	121.92
Stack Exit Diameter (meters)	6.096	6.096	6.096	6.096	6.096	6.096	6.096
Stack Exit Temperature (Kelvin)	336	322.83	322.83	322.83	322.83	322.83	322.83
Stack Exit Velocity (m/s)	22.6	21.34	21.34	21.34	21.34	21.34	21.34

[a] H_2SO_4 assumed to be 100 percent of the SO_4 emissions calculated by the NPS Speciation Spreadsheet.

Table 17: CALPUFF Inputs for Unit 2

Model Input Data	Pre-Consent Decree	Consent Decree	Rotamix or SNCR	ROFA/ Rotamix	ROFA	SCR/SNCR Hybrid	SCR with Sorbent
Hourly Heat Input (MMBtu/hour)	3688	3688	3688	3688	3688	3688	3688
Sulfur Dioxide (SO_2) (lb/MMBtu)	0.23	0.18	0.18	0.18	0.18	0.18	0.18
Sulfur Dioxide (SO_2) (lb/hr)	844.0	663.8	663.8	663.8	663.8	663.8	663.8
Nitrogen Oxide (NOx) (lb/MMBtu)	0.45	0.33	0.23	0.20	0.26	0.18	0.07
Nitrogen Oxide (NOx) (lb/hr)	1649.3	1217.0	848.2	737.6	958.9	663.8	258.2
PM (lb/MMBtu)	0.050	0.015	0.015	0.015	0.015	0.015	0.015
PM (lb/hr)	184.4	55.3	55.3	55.3	55.3	55.3	55.3
SO_3 as Sulfuric Acid (H_2SO_4) (lb/MMBtu)	0.013	0.011	0.011	0.011	0.011	0.031	0.004
SO_3 as Sulfuric Acid (H_2SO_4)[(a)] (lb/hr)	49.7	40.3	40.3	40.3	40.3	113.6	16.0
Stack Conditions							
Stack Height (meters)	121.92	121.92	121.92	121.92	121.92	121.92	121.92
Stack Exit Diameter (meters)	6.096	6.096	6.096	6.096	6.096	6.096	6.096
Stack Exit Temperature (Kelvin)	338	322.83	322.83	322.83	322.83	322.83	322.83
Stack Exit Velocity (m/s)	23.5	21.34	21.34	21.34	21.34	21.34	21.34

[(a)] H_2SO_4 assumed to be 100 percent of the SO_4 emissions calculated by the NPS Speciation Spreadsheet.

Table 18: CALPUFF Inputs for Unit 3

Model Input Data	Pre-Consent Decree	Consent Decree	Rotamix or SNCR	ROFA/ Rotamix	ROFA	SCR/SNCR Hybrid	SCR with Sorbent
Hourly Heat Input (MMBtu/hour)	5758	5758	5758	5758	5758	5758	5758
Sulfur Dioxide (SO_2) (lb/MMBtu)	0.28	0.18	0.18	0.18	0.18	0.18	0.18
Sulfur Dioxide (SO_2) (lb/hr)	1591.1	1036.4	1036.4	1036.4	1036.4	1036.4	1036.4
Nitrogen Oxide (NOx) (lb/MMBtu)	0.42	0.33	0.23	0.20	0.26	0.18	0.07
Nitrogen Oxide (NOx) (lb/hr)	2405.5	1900.1	1324.3	1151.6	1497.1	1036.4	403.1
PM (lb/MMBtu)	0.050	0.015	0.015	0.015	0.015	0.015	0.015
PM (lb/hr)	287.9	86.4	86.4	86.4	86.4	86.4	86.4
SO_3 as Sulfuric Acid (H_2SO_4) (lb/MMBtu)	0.013	0.011	0.011	0.011	0.011	0.031	0.004
SO_3 as Sulfuric Acid (H_2SO_4)[a] (lb/hr)	77.7	62.9	62.9	62.9	62.9	177.3	25
Stack Conditions							
Stack Height (meters)	121.92	121.92	121.92	121.92	121.92	121.92	121.92
Stack Exit Diameter (meters)	8.534	8.534	8.534	8.534	8.534	8.534	8.534
Stack Exit Temperature (Kelvin)	335	322.83	322.83	322.83	322.83	322.83	322.83
Stack Exit Velocity (m/s)	17.07	17.07	17.07	17.07	17.07	17.07	17.07

[a] H_2SO_4 assumed to be 100 percent of the SO_4 emissions calculated by the NPS Speciation Spreadsheet.

Table 19: CALPUFF Inputs for Unit 4

Model Input Data	Pre-Consent Decree	Consent Decree	Rotamix or SNCR	ROFA/ Rotamix	ROFA	SCR/SNCR Hybrid	SCR with Sorbent
Hourly Heat Input (MMBtu/hour)	5649	5649	5649	5649	5649	5649	5649
Sulfur Dioxide (SO_2) (lb/MMBtu)	0.29	0.18	0.18	0.18	0.18	0.18	0.18
Sulfur Dioxide (SO_2) (lb/hr)	1662.4	1016.8	1016.8	1016.8	1016.8	1016.8	1016.8
Nitrogen Oxide (NOx) (lb/MMBtu)	0.42	0.33	0.23	0.20	0.26	0.18	0.07
Nitrogen Oxide (NOx) (lb/hr)	2399.6	1864.2	1299.3	1129.8	1468.7	1016.8	395.4
PM (lb/MMBtu)	0.050	0.015	0.015	0.015	0.015	0.015	0.015
PM (lb/hr)	282.5	84.7	84.7	84.7	84.7	84.7	84.7
SO_3 as Sulfuric Acid (H_2SO_4) (lb/MMBtu)	0.013	0.011	0.011	0.011	0.011	0.031	0.004
SO_3 as Sulfuric Acid (H_2SO_4)[(a)] (lb/hr)	76.2	61.7	61.7	61.7	61.7	174.0	24.5
Stack Conditions							
Stack Height (meters)	121.92	121.92	121.92	121.92	121.92	121.92	121.92
Stack Exit Diameter (meters)	8.534	8.534	8.534	8.534	8.534	8.534	8.534
Stack Exit Temperature (Kelvin)	331	322.83	322.83	322.83	322.83	322.83	322.83
Stack Exit Velocity (m/s)	17.4	16.76	16.76	16.76	16.76	16.76	16.76

[(a)] H_2SO_4 assumed to be 100 percent of the SO_4 emissions calculated by the NPS Speciation Spreadsheet.

Visibility Post-Processing (CALPOST)

Light extinction must be computed to calculate visibility. CALPOST has seven methods for computing light extinction. As recommended by the WRAP RMC protocol, this BART technology analysis used Method 6, which computes extinction from speciated PM with monthly Class I area-specific relative humidity adjustment factors. Relative humidity is an important factor in determining light extinction (and therefore visibility) because sulfate and nitrate aerosols, which absorb moisture from the air have greater extinction efficiencies with greater relative humidity. This BART analysis used relative humidity correction factors [f(RH)s], obtained from Table A-3 of the EPA's *Guidance for Estimating Natural Visibility Conditions under the Regional Haze Rule* (EPA, 2003), to determine sulfate and nitrate concentrations outputs from CALPUFF. The f(RH) values for each Class I area that was assessed are provided in Table 20. The default Rayleigh scatter value (bray) of 10 Mm-1 was also used. The light extinction equation is as follows:

$$b_{ext} = 3 * f(RH) * [(NH_4)_2SO_4] + 3* f(RH) * [NH_4NO_3] + 4*[OC] + 1* [PM_f] + 0.6*[PM_c] + 10* [EC] + b_{ray}$$

Table 20: Monthly Relative Humidity Factors[a] for CALPOST

Class I Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Arches	2.6	2.3	1.8	1.6	1.6	1.3	1.4	1.5	1.6	1.6	2.0	2.3
Bandelier	2.2	2.1	1.8	1.6	1.6	1.4	1.7	2.1	1.9	1.7	2.0	2.3
Black Canyon of the Gunnison	2.4	2.2	1.9	1.9	1.9	1.6	1.7	1.9	2.0	1.8	2.1	2.3
Canyonlands	2.6	2.3	1.7	1.6	1.5	1.2	1.3	1.5	1.6	1.6	2.0	2.3
Capitol Reef	2.7	2.4	2.0	1.7	1.6	1.4	1.4	1.6	1.6	1.7	2.1	2.5
Grand Canyon	2.4	2.3	1.9	1.5	1.4	1.2	1.4	1.7	1.6	1.6	1.9	2.3
Great Sand Dunes	2.4	2.3	2.0	1.9	1.9	1.8	1.9	2.3	2.2	1.9	2.4	2.4
La Garita	2.3	2.2	1.9	1.8	1.8	1.6	1.7	2.1	2.0	1.8	2.2	2.3
Maroon Bells	2.2	2.1	2.0	2.0	2.1	1.7	1.9	2.2	2.1	1.8	2.1	2.1
Mesa Verde	2.5	2.3	1.9	1.5	1.5	1.3	1.6	2.0	1.9	1.7	2.1	2.3
Pecos	2.3	2.1	1.8	1.7	1.7	1.5	1.8	2.1	2.0	1.7	2.0	2.2
Petrified Forest	2.4	2.2	1.7	1.4	1.3	1.2	1.5	1.8	1.7	1.6	1.9	2.3
San Pedro Parks	2.3	2.1	1.8	1.6	1.6	1.4	1.7	2.0	1.9	1.7	2.1	2.2
West Elk	2.3	2.2	1.9	1.9	1.9	1.7	1.8	2.1	2.0	1.8	2.1	2.2
Weminuche	2.4	2.2	1.9	1.7	1.7	1.5	1.6	2.0	1.9	1.7	2.1	2.3
Wheeler Peak	2.3	2.2	1.9	1.8	1.8	1.6	1.8	2.2	2.1	1.8	2.2	2.3

[a]Table A-3 of the EPA's *Guidance for Estimating Natural Visibility Conditions under the Regional Haze Rule*

According to the final BART rule, the EPA's default average annual aerosol concentrations for the western half of the United States, included in Table 2-1 of EPA's *Guidance for Estimating Natural Visibility Conditions Under Regional Haze Rule (EPA-454/B-03-005, September 2003)*, were used to determine the natural background conditions representative of the Annual Average Natural Visibility Conditions in each Class I area used as a reference for determination of the modeled Δdv change. Table 21 provides the Average Natural Levels of Aerosol Components.

Table 21: Average Annual Natural Background Levels[a]

Component	Average Annual Natural Background ($\mu g/m^3$)
Ammonium Sulfate	0.12
Ammonium Nitrate	0.10
Organic Carbon Mass	0.47
Elemental Carbon	0.02
Soil	0.50
Coarse Mass	3.00

[a]Table 2-1 of the EPA's *Guidance for Estimating Natural Visibility Conditions under the Regional Haze Rule.*

Modeling Results

From the air dispersion modeling methodology outlined in the previous section, a CALPUFF model run was conducted for the following control technologies for each unit during the BART engineering analysis, including the pre-consent decree: Consent Decree, SNCR or Rotamix, ROFA/Rotamix, ROFA,, SCR/SNCR Hybrid (SCR/SNCR Hybrid with Inherent SO_3 Removal), SCR with Sorbent (SCR with Inherent SO_3 Removal and Sorbent Injection), PJFF, and WESP. To simplify the quantity of the modeling results, total visibility impacts at all 16 Class I areas were used to make comparisons of each control technology's performance.

For both the facility-wide and unit-by-unit modeling analysis conducted with the 2001-2003 years of meteorological data, the expected degree of visibility impact for each control technology was determined by the difference between the visibility impaired by the facility sources and annual average natural visibility conditions for each receptor at each of the 16 Class I area which is indicative of delta-deciview (delta-dv).

Visibility Impact of NOx Control Technology

The results of the visibility modeling for Unit 1, Unit 2, Unit 3, and Unit 4 for each of the NOx control technologies are illustrated in Appendix A, Tables 1-28. These tables summarize the 98th percentile visibility impact for the pre-consent decree, baseline, and control scenarios, and the average and maximum number of days exceeding 0.5 dv threshold estimated at each of the Class I areas.

A summary of each graph representing the results of the visibility modeling is provided as follows:

Figure 4 illustrates the maximum visibility deciview impact for each NOx control technology seen at **each Class I area** for the years 2001-2003 on a **facility-wide basis.**

Figure 5 illustrates the maximum visibility deciview impact for each NOx control technology seen at **each Class I area** for the years 2001-2003 on a **unit-by-unit basis.**

Figure 6 illustrates the maximum visibility deciview impact for each NOx control technology seen at **Mesa Verde National Park** for the years 2001-2003 on a **facility-wide basis.**

Figure 7 illustrates the maximum visibility deciview impact for each NOx control technology seen at **Mesa Verde National Park** for the years 2001-2003 on a **unit-by-unit basis.**

Visibility Impact of PM Control Technology

The visibility modeling performed for the WESP control option was performed on a facility-wide and unit-by-unit basis. The results of the facility-wide analysis demonstrate a net improvement of 0.62 dv at Mesa Verde National Park and 0.14 dv improvement at San Pedro Parks Wilderness. The amount of visibility improvement at all other Class I areas was equal to or less than 0.1 dv improvement.

The results of the unit-by-unit impact analysis demonstrate a 0.21 dv improvement for Units 3 and 4 at Mesa Verde National Park. However, all other impact analyses show less than a 0.1 dv improvement at any of the Class I areas for Units 1-4.

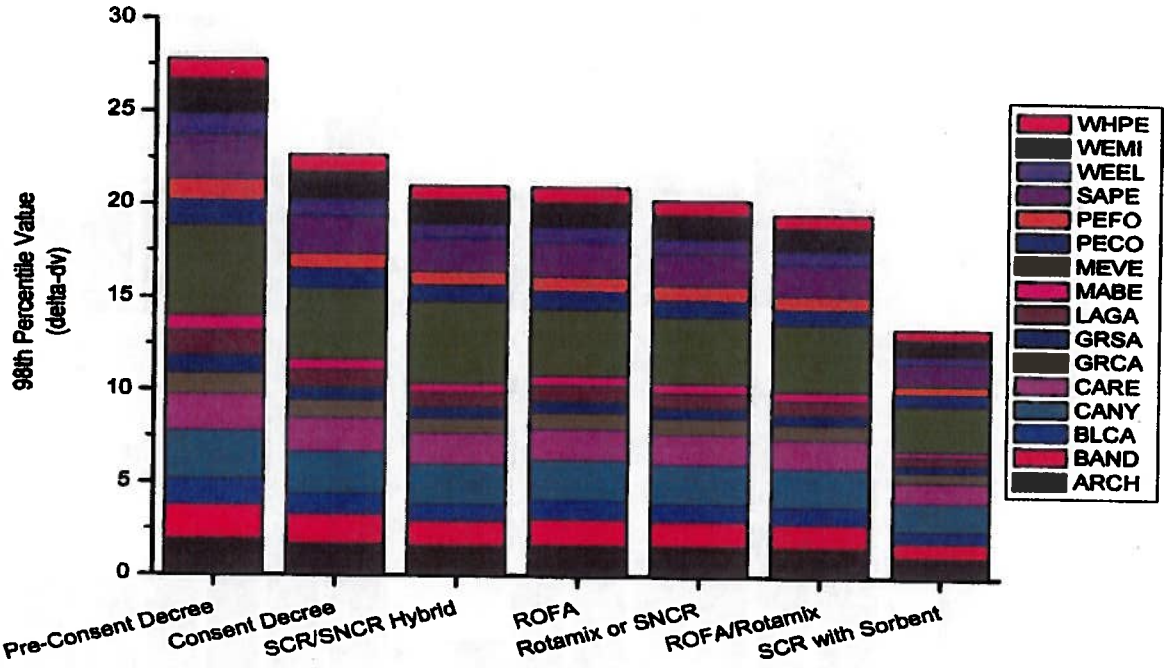

Figure 4: Total Amount of the Visibility Impacts at All 16 Class I Areas Using 2001-2003 Meteorological Data (facility-wide impact)

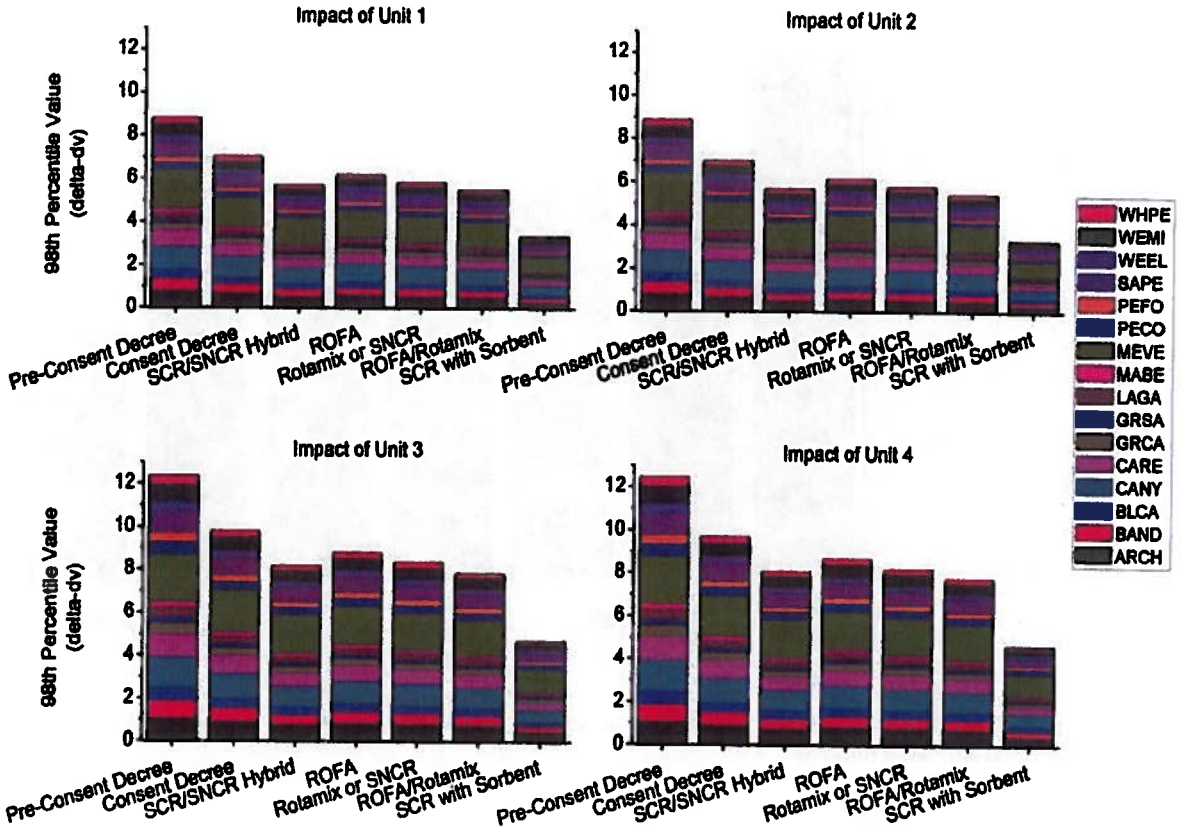

Figure 5: Total Amount of the Visibility Impacts at All 16 Class I Areas Using 2001-2003 Meteorological Data (units 1, 2, 3, and 4)

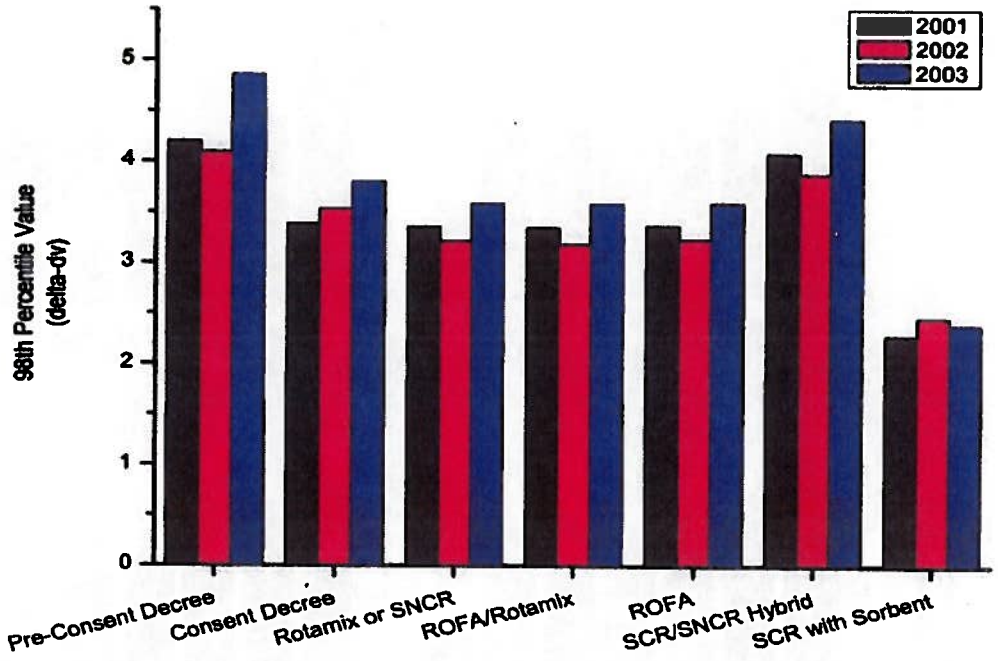

Figure 6: Visibility Impact at Mesa Verde National Park Using 2001-2003 Meteorological Data (facility-wide impact)

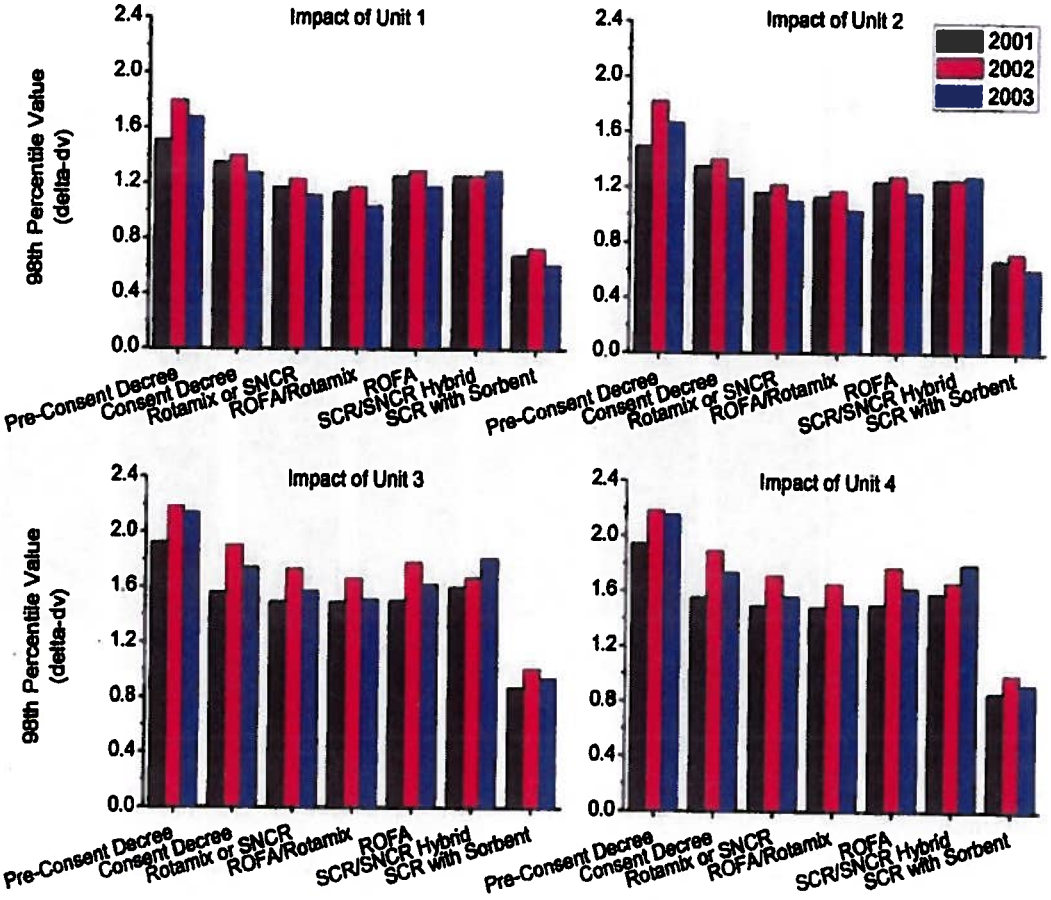

Figure 7: Visibility Impact at Mesa Verde National Park Using 2001-2003 Meteorological Data (units 1, 2, 3, and 4)

Department Selection of BART for NOx and PM

In accordance with Section 169A(g)(7) of the Clean Air Act, the Department considered the following five statutory factors in the BART analysis for the SJGS: (1) the costs of compliance; (2) energy and non-air quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of improvement in visibility which may reasonably by anticipated to result from the use of such technology.

PM BART Determination

Based on the five factor analysis, the Department has determined that BART for Units 1-4 for PM is existing PJFF technology and the existing emission rate of 0.015 lb/MMBtu. The Department's determination of BART was based on the following results of the full five factor analysis:

1) Each of Units 1-4 is equipped with PJFF and is subject to a federally-enforceable emission limit of 0.015 lb PM/MMBtu.

2) The Department reviewed both the cost-effectiveness and incremental cost-effectiveness of additional control technology (WESP) and found these costs to be excessive. See Table 11.

3) There are additional energy impacts associated with the WESP technology and the Department considers these costs to be reasonable.

4) The Department reviewed the visibility improvement that resulted from the installation of the consent decree technology (PJFF and LNB/OFA) and that would result from the addition of WESP technology. The Department determined that on a facility-wide basis the visibility improved by 1.06 deciviews (dv) from the installation of the consent decree technology at Mesa Verde National Park (Mesa Verde). The installation of WESP would result in a facility-wide improvement of 0.62 dv at Mesa Verde. Improvements on a unit-by-unit basis at all Class I areas showed very minor improvements, usually less than 0.1 dv.

NOx BART Determination

Based on the five factor analysis, the Department has determined that BART for Units 1-4 for NOx is SNCR technology and an emission rate of 0.23 lb/MMBtu on a 30-day rolling average. The Department's determination of BART was based on the following results of the five factor analysis:

1) SNCR technology is considered cost-effective at an average cost of $3,494 dollars per ton of NOx removed. SNCR technology will reduce the facility annual NOx emissions by 4,900 tons.

2) The SNCR technology will result in additional energy impacts and non-air impacts. The SNCR technology will require a new reagent system and a reagent storage system. The Department considered these additional costs in the review of the overall cost-effectiveness of SNCR and found these costs to be reasonable.

3) The Department reviewed the visibility improvement that resulted from the installation of the SNCR technology. The Department determined that on a facility-wide basis the visibility improved by 0.25 dv at San Pedro, 0.22 dv at Mesa Verde, and 0.21 at Bandelier.

4) An emission limit of 0.23 lb NOx/MMBtu at each of Units 1-4 equals the EPA's established presumptive limit for dry-bottom, wall-fired boilers burning sub-bituminous coal.

5) The Department reviewed additional economic information provided by PNM that analyzed the economic impact to ratepayers in New Mexico. The PNM estimates indicate the cost of control technology beyond SNCR would be financially burdensome and cause economic hardship to low-income New Mexicans. According to the US Census Bureau, as of 2009, 18% of New Mexicans were living below the poverty line, as defined by the federal poverty standards. PNM estimates a rate increase of $11.50 per year per residential ratepayer from the installation of SNCR versus an estimated rate increase of $82.00 per year from the installation of SCR.

6) The Department has determined that in light of the unreasonable costs of SCR, particularly as reflected in the impact on ratepayers, requiring controls to achieve reductions beyond the most stringent presumptive standard prescribed by EPA is not justified.

References

1. 40 CFR 51 – Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations

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3. Public Service Company of New Mexico BART Technology Analysis for the San Juan Generating Station (June 6, 2007 and submittal updates)

4. EPA. (2003). Air Pollution Control Technology Fact Sheet (SNCR). Retrieved from http://www.epa.gov/ttn/catc/dir1/fsncr.pdf

5. EPA. (2003). Air Pollution Control Technology Fact Sheet (SCR). Retrieved from http://www.epa.gov/ttn/catc/dir1/fscr.pdf

6. EPA. (2003). Guidance for Estimating Natural Visibility Conditions under the Regional Haze Rule. http://www.epa.gov/ttncaaa1/t1/memoranda/rh_envcurhr_gd.pdf