

APPENDIX D

EVIDENCE OF PUBLIC PARTICIPATION; PUBLIC COMMENTS AND NEVADA'S RESPONSES

CONTENTS

D.1	EVIDENCE OF PUBLIC PARTICIPATION.....	1
D.1.1	Public Notice of Hearing.....	3
D.1.2	Newspaper Affidavits.....	5
D.1.3	Public Hearing Agenda.....	9
D.1.4	SIP Approval Authority.....	10
D.2	PUBLIC COMMENTS AND NEVADA’S RESPONSES.....	11
D.2.1	Oral Comments at the Public Hearing.....	13
D.2.2	Written Comments and Nevada’s Responses.....	15
D.2.2.1	Summary.....	15
D.2.2.2	U.S. Environmental Protection Agency.....	17
2.2.2.1	Comment Letter.....	19
2.2.2.2	Nevada’s Response.....	23
D.2.2.3	U.S. Department of Interior, National Park Service.....	27
2.2.3.1	Comment Letter.....	29
2.2.3.2	Nevada’s Response.....	59
D.2.2.4	Consortium of Conservation Organizations.....	85
2.2.4.1	Comment Letter.....	85
2.2.4.2	Technical Review by Air Resource Specialists, Inc.....	97
2.2.4.3	Nevada’s Response.....	133

SECTION D.1
EVIDENCE OF PUBLIC PARTICIPATION

D.1.1 PUBLIC NOTICE OF HEARING

NOTICE OF PUBLIC COMMENT PERIOD BEGINNING APRIL 17, 2009 AND A PUBLIC HEARING ON MAY 20, 2009

conducted by the
Nevada Division of Environmental Protection
Bureau of Air Quality Planning

Pursuant to the public hearing requirements in Title 40 of the Code of Federal Regulations Part 51 section 102, the Nevada Division of Environmental Protection (NDEP) is issuing the following notice.

NDEP has scheduled a public hearing on Wednesday, May 20, 2009 from 9:30 a.m. to 12:00 p.m. The hearing will be held at the Western Nevada College campus located at 2201 West College Parkway, Room 103 of the Reynolds Building, in Carson City, Nevada. The purpose of the hearing is to receive comments from all interested persons regarding Nevada's *Draft Regional Haze State Implementation Plan* (RH SIP).

In 1977, Congress amended the Clean Air Act (CAA) establishing a national goal to protect visibility in Class I federal areas - primarily national parks and wilderness areas. The amendments called for the "prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution." Nevada has one mandatory Class I area, the Jarbidge Wilderness Area, in the northeast corner of the state managed by the U.S. Forest Service.

In 1999, the U.S. Environmental Protection Agency adopted the Regional Haze Rule (RHR; 40 CFR 51.308). The intent of the RHR is to improve visibility over the next 56 years in all mandatory Class I areas across the country. It requires each affected state to develop and adopt a plan that will improve the haziest days and protect the clearest days at each mandatory Class I area in the state with a goal of returning to natural visibility conditions by the year 2064. Each plan must provide a comprehensive analysis of natural and man-made sources of haze for each mandatory Class I area in the state and contain strategies to control anthropogenic emissions that contribute to haze. The plan must also address the transport of haze across state boundaries.

NDEP has prepared a draft RH SIP to meet the requirements of the federal RHR. Though national visibility goals are to be achieved by the year 2064, the current plan meets the requirements of improving visibility for the most impaired days and ensuring no degradation in visibility for the least impaired days for the period ending in 2018, the first planning period in the federal rule. Nevada's RH SIP contains strategies and elements related to each requirement of the federal rule.

The draft SIP and related materials are available on the NDEP website at: <http://ndep.nv.gov/baqp/planning.html>. Access to the draft SIP may also be obtained by contacting Adele Malone at NDEP, 901 S. Stewart Street, Suite 4001, Carson City, NV 89701; (775) 687-9356; or e-mail to amalone@ndep.nv.gov. Persons wishing to comment on the proposed SIP during the comment period should submit their comments in writing either in person or by mail or fax to Adele Malone at the NDEP address, or by FAX at (775) 687-6396. Oral comments will be received at the Hearing. Written comments will be received by NDEP at the above address or at the Hearing from April 17 through May 20, 2009 and will be retained and considered.

Please bring the foregoing notice to the attention of all persons you know that may be interested in this matter.

This notice has been published in the Las Vegas Review-Journal and the Reno Gazette Journal newspapers. It has been posted at the NDEP offices in Carson City and Las Vegas, at the State Library in Carson City and at County libraries throughout Nevada. Members of the public who are disabled and require special accommodations or assistance at the meeting are requested to notify Adele Malone or Cathy Douglas (775-687-9349) no later than 3 working days before the hearing. 4/14/09

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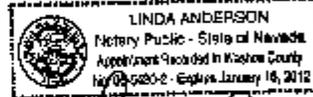
Being first duly sworn, deposes and says: That as the legal clerk of the Reno Gazette-Journal, a daily newspaper published in Reno, Washoe County, State of Nevada, that the notice referenced below has published in each regular and entire issue of said newspaper between the dates: 04/17/2009 - 04/17/2009, for exact publication dates please see last line of Proof of Publication below.

Subscribed and sworn to before me

Signed:

Helle Butler

APR 17 2009



Linda Anderson

Proof of Publication

NOTICE OF PUBLIC HEARING April 14, 2009 conducted by the Nevada Division of Environmental Protection Bureau of Air Quality Planning Pursuant to the public hearing requirements in Title 40 of the Code of Federal Regulations Part 51 section 102, the Nevada Division of Environmental Protection (NDEP) is issuing the following notice. NDEP has scheduled a public hearing on Wednesday, May 20, 2009 from 9:30 a.m. to 12:00 p.m. The hearing will be held at the Western Nevada College campus located at 2201 West College Parkway, Room 103 of the Reynolds Building, Carson City, Nevada. The purpose of the hearing is to receive comments from all interested persons regarding Nevada's Draft Regional Haze State Implementation Plan (RH SIP). In 1977, Congress amended the Clean Air Act (CAA) establishing a national goal to protect visibility in Class I Federal areas - national parks, forests and wilderness areas. The amendments called for the "prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from man-made air pollution." Nevada has one mandatory Class I area, the Jarvisburg Wilderness Area (Jarvisburg WA) in the northeast corner of the state and managed by the U.S. Forest Service. In 1999, the U.S. Environmental Protection Agency (USEPA) adopted the Regional Haze Rule (RHR; 40 CFR 51.308). The intent of the RHR is to improve visibility over

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Page 1 of 1

D.1.3 PUBLIC HEARING AGENDA

Public Hearing on NEVADA'S DRAFT REGIONAL HAZE STATE IMPLEMENTATION PLAN

Western Nevada College
2201 West College Parkway
Reynolds Bldg, Room 103
Carson City, NV

May 20, 2009
9:30 AM - 12:00 Noon

AGENDA¹

- I. Welcome; introductions.
- II. Purpose of the Hearing is to:
 - Present Nevada's proposed Regional Haze State Implementation Plan, and
 - Receive comments from all interested persons regarding the Plan.
- III. Approval of agenda; Outline Hearing Procedure.
- IV. SIP timeline
 - Response to comments
 - Submittal to U.S. EPA
 - Action by U.S. EPA
- V. Background; 1999 Regional Haze Rule/Clean Air Act.
- VI. Presentation of RH SIP findings, plan, commitments.
- VII. Public comments and questions; discussion. Public comment may be limited to five minutes per person at the discretion of the chairperson. The chair reserves the right to dispense with repetitive comments on a given topic.
- VIII. Adjourn.

Members of the public who are disabled and require special accommodations or assistance at the meeting are requested to notify Adele Malone at 901 S. Stewart St., Ste. 4001, Carson City NV 89701 or 775-687-9349, at least 20 hours in advance of the Hearing.

The proposed agenda is also posted on the NDEP website at <http://ndep.nv.gov/>, as well at the NDEP offices in Carson City and Las Vegas, at the State Library in Carson City and at County Libraries throughout Nevada.

¹ There are no action items on the agenda.

D.1.4 SIP APPROVAL AUTHORITY

ALLEN BIAGGI
Director

JIM GIBBONS
Governor

KAY SCHERER
Deputy Director

State of Nevada
Department of Conservation and Natural Resources
Office of the Director
Richard H. Bryan Building
901 S. Stewart Street, Suite 5001
Carson City, Nevada 89701
Telephone (775) 684-2700
Facsimile (775) 684-2715
www.dcnr.nv.gov



Division of Conservation Districts
Division of Environmental Protection
Division of Forestry
Division of State Lands
Division of State Parks
Division of Water Resources
Natural Heritage Program
Wild Horse Program

STATE OF NEVADA
Department of Conservation and Natural Resources
OFFICE OF THE DIRECTOR

May 30, 2007

Wayne Nastri
Regional Administrator
ORA-1, USEPA Region 9
75 Hawthorne Street
San Francisco CA 94105

Dear Mr. Nastri:

Nevada Revised Statutes 445B.205 designates the Department of Conservation and Natural Resources (Department) as the air pollution control agency for the State of Nevada for the purposes of the Clean Air Act insofar as it pertains to State programs. Within the Department, the Division of Environmental Protection has responsibility to manage the air quality planning and air pollution control programs for the State of Nevada. Therefore, pursuant to Nevada Administrative Code 445B.053, I am hereby assigning the Administrator of the Nevada Division of Environmental Protection, or the Deputy Administrator acting on his behalf, to be my official designee for the purposes of the Clean Air Act, including, but not limited to, adoption, revision and submittal of state plans and state implementation plans.

Sincerely,

Handwritten signature of Allen Biaggi in black ink, appearing as "Allen Biaggi" with a stylized flourish at the end.

Allen Biaggi
Director

cc Michael Dayton, Chief of Staff, Office of the Governor
Jodi Stephens, Deputy Chief of Staff, Office of the Governor
Leo Drozdoff, Administrator, NDEP
Colleen Cripps, Deputy Administrator, NDEP
Tom Porta, Deputy Administrator, NDEP
Deborah Jordan, Director, EPA Air Division, Region IX
Jefferson Wehling, ORC, EPA Region IX

SECTION D.2
PUBLIC COMMENTS AND NEVADA'S RESPONSES

D.2.1 ORAL COMMENTS AT THE PUBLIC HEARING

**Public Testimony given at the
Nevada Regional Haze State Implementation Plan
Public Hearing
May 20, 2009
Western Nevada Community College**

Attendees:

NDEP-BAQP Staff

Adele Malone
Brenda Harpring
Frank Forsgren
Paul Williams

Public

Robert Boyd, BLM
Sandy Gregory, BLM
Tansey Smith, Inter-Tribal Council of Nevada

10:23 AM - Public Comments:

Tansey Smith, Inter-Tribal Council of Nevada, asked how many air monitors there are in the state. Frank Forsgren, NDEP, stated that for the purposes of visibility there is only one monitor, which is located at the Jarbidge Wilderness area about a mile north of the community of Jarbidge. That monitor is part of the IMPROVE monitoring network.

Robert Boyd, Soil Water Air Program Lead for the Nevada State Office of BLM, asked if there was a monitor at the Great Basin National Park. Mr. Forsgren replied that the National Park Service does maintain a monitor at Great Basin, but because it does not qualify as a Class I area, it was not appropriate to use that monitor in evaluating reasonable progress in terms of visibility impairment. Adele Malone, Supervisor, BAQP-NDEP, stated that the state does have a network of monitors throughout the state to evaluate NAAQS compliance.

Ms. Smith asked why the State of Nevada was not a full member of the WRAP (Western Regional Air Partnership). Mr. Forsgren noted that Nevada has been a full participant in the WRAP, participating in all of the working groups and attending forums, and has provided financial support as well. He thought that the decision to not join the WRAP was made back when it was the Grand Canyon Visibility Transportation Commission (GCVTC), the precursor to the WRAP. He thought that the decision was made on the advice of some of the Nevada stakeholders who were uncomfortable with some of the conclusions reached by the GCVTC, because they had the potential to impede economic development. Therefore, they asked the state to decline becoming a formal member of the WRAP and the state complied. He noted that the state had a stakeholders meeting about three years ago and asked them if they wanted the state to

be a member of the WRAP and there was not a positive response. However, he reiterated that NDEP is fully active in all aspects of the WRAP.

Ms. Smith wondered what the benefits of being a full member of the WRAP would be. Ms. Malone indicated that it would probably give the state a vote on certain issues and it would require the state to follow their directives, which we are not required to do as just a participant. Ms. Smith said she had a bunch of other questions and would like to set up a meeting after the hearing to discuss further issues that she had. Ms. Malone agreed to meet with her.

Robert Boyd, BLM, expressed general support for the approach that was used in the SIP regarding existing regulations, tools, and rules as being sufficient to address the need to improve visibility for Jarbidge and other areas. He indicated that BLM has been an active participant in this process and would continue. He gave BLM's participation in the smoke management process as an example. He then went into some detail on how BLM is and will be addressing fugitive dust throughout Nevada that he felt hopefully would make the assumptions in the State's Regional Haze Plan not get worst. He went on to review the research that BLM has funded regarding addressing off highway vehicles, which will be beneficial for future modeling of dust emissions. They are also looking at biological soil crusts to manage soil stability. He concluded by saying that once the Regional Haze SIP was approved, they would be incorporating it into their land use planning efforts.

Sandy Gregory, Hazardous Fields Program Lead for the Nevada State Office of BLM, had a question regarding the state's Smoke Management Plan (SMP) and how it was going to relate to the Regional Haze Plan, specifically with respect to smoke sensitive areas. She felt that it had a fairly broad definition and wondered how it was going to be interpreted in the Regional Haze Plan. Ms. Malone responded the EPA requires that the states look at Smoke Management Plans that are in place and in this case we have incorporated Nevada's SMP in the SIP as it exists without any changes. Ms. Gregory stated that they are really happy with the way the Smoke Management Plan is designed. Mr. Forsgren added that across the west, fire is a big driver of emissions. The smoke management program has allowed the state to better quantify the real impacts. Ms. Gregory indicated that often, because of the fuel type, control burns are only at 60 percent of the estimated emissions. She thought that they should be allowed to submit actual emissions, which would prove that they are doing a lot better.

Mr. Forsgren thanked everyone who made comments and closed the hearing at 10:40 AM.

D.2.2 WRITTEN COMMENTS AND NEVADA'S RESPONSES

D.2.2.1 Summary

NDEP received three sets of written comments during its 30-day public comment period ending May 20, 2009. These comments were from the U.S. Environmental Protection Agency (USEPA), the U.S. Department of Interior National Park Service (NPS), and a consortium of conservation or non-governmental organizations (NGOs). USEPA's only expressed concerns or questions at this time are with regard to NDEP's Best Available Retrofit Technology (BART) determination for the Reid Gardner Generating Station and specifically the BART sulfur dioxide (SO₂) emission limitations.

NDEP received "follow-up" comments from the NPS during the public review period, including comments on NDEP's BART determination reviews of NV Energy BART analyses. Prior to the public comment period, Federal Land Managers (FLMs) were provided the opportunity to comment on the FLM consultation draft of Nevada's RH SIP. NDEP received comments from the NPS, the Fish and Wildlife Service (FWS) and the U.S. Forest Service (USFS) during the FLM review period. NDEP prepared responses to these comments as documented in Appendix C. Any revisions resulting from the FLM comments were incorporated into the draft SIP before it was released for the 30-day public comment period.

The NPS "follow-up" comments on the public review draft of Nevada's RH SIP focus on the BART process including:

- the degree of emphasis placed on visibility improvement,
- the use of dollars per deciview as a cost-effectiveness metric,
- inflation of control costs by the facilities, and
- specific BART emission limits.

NPS also made ancillary comments on other topics.

Finally, NDEP received a letter of comments from a group of conservation or non-governmental organizations. The signatories are: National Parks Conservation Association, Western Resource Advocates, Nevada National Wildlife Federation, Bristlecone Alliance, Center for Biological Diversity, Nevada Conservation League and Education Fund, Wasatch Clear Air Coalition, Citizens for Dixie's Future, Public Resource Associates, Sevier Citizens for Clean Air and Water, Post Carbon Salt Lake, Sierra Club, Grand Canyon Trust, and Utah Moms for Clean Air. The comments from this group are referred to as "NGO comments" in the remainder of this document.

Attached to the NGO letter and included in the comments by reference is a report by D. Howard Gebhart of Air Resources Specialists, Inc. prepared for the Western Resource Advocates and National Parks Conservation Association titled *Technical Review of Draft Nevada State Implementation Plan for Regional Haze (April 2009) Expert Report* (this document is referred to as the "Tech Review" for the remainder of NDEP's responses). The Tech Review is a support document for issues summarized in the NGO comments.

The NGO comments focus on five main areas:

- the FLM consultation process,
- the projected 2018 emission inventory,
- the BART determination for Reid Gardner Generating Station,
- reasonable progress for Class I areas in adjacent states, and
- inclusion of specific sources in the 2018 projected emission inventory.

NDEP addresses these comments in the following sections. Complete copies of the comment letters precede NDEP's response.

SECTION D.2.2.2

U.S. ENVIRONMENTAL PROTECTION AGENCY

D.2.2.2 U.S. Environmental Protection Agency

D.2.2.2.1 Comment Letter



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

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ENVIRONMENTAL PROTECTION

May 20, 2009

Adele King Malone, ES IV, Supervisor
Planning Branch, Bureau of Air Quality Planning
Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701
Fax: (775) 687-6396

Nevada
Environmental Protection

MAY 26 2009

BAPC/BAQP

Ms. Malone,

The EPA appreciates the opportunity to review and comment on your proposed Regional Haze SIP revision. What follows are initial questions that reflect our review of the SIP to date. These are the same questions we discussed in our conference call with Nevada Division of Environmental Protection staff on May 19, 2009. We may have additional questions and comments once the final version is submitted to EPA.

Your proposed Regional Haze SIP revision appears to be in good order and we have only a few questions at this time. Our questions are regarding the proposed BART determination for the Reid Gardner power plant. We agree with the control technology determinations, but are concerned about how the controls are going to be made enforceable.

- Are they going to be explicitly required by regulation?
- Will there be a permit change requiring the installation and operation of the equipment at defined control efficiencies?

We are also concerned about the 0.25 lb/MMBTU SO₂ limit proposed as the BART determination for Reid Gardner. It appears to be substantially higher than the emission rate the plant is currently achieving. The National Park Service and Fish and Wildlife Service (NPS-FWS) determined that, based on the acid rain database, the plant is currently achieving 0.05 lb/MMBTU on an annual average basis. Setting the 24-hour limit five times higher than the achieved annual emission rate seems to exceed what is required to account for normal operational variability. As a result, it may allow for changes that would result in higher actual emissions.

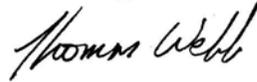
- Do you concur with the NPS-FWS analysis of the annual emission rate? If not, the EPA would like to see an explanation of your position in sufficient quantitative detail for an outside party to replicate your analysis.

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- How will Nevada ensure that the proposed 24-hour SO₂ limit will not result in actual emission increases from this plant on a 24-hour basis and/or on an annual basis?

We appreciate the opportunity to provide input at this stage of the process and look forward to continued collaboration with Nevada on improving visibility in Class 1 areas.

Sincerely,



for Lisa Hanf, Chief
Planning Office
Air Division
EPA Region IX

SECTION D.2.2.2.2

NEVADA'S RESPONSE

(to U.S. Environmental Protection Agency Comment Letter)

2.2.2.2 Nevada's Response

USEPA's only expressed concerns or questions at this time are with regard to NDEP's BART determination for the Reid Gardner Generating Station and specifically the BART SO₂ emission limitations. NDEP responses to specific comments are provided below, with USEPA's comment in italics and NDEP's response following in plain text.

EPA Comment 1:

Your proposed Regional Haze SIP revision appears to be in good order and we have only a few questions at this time. Our questions are regarding the proposed BART determination for the Reid Gardner power plant. We agree with the control technology determinations, but are concerned about how the controls are going to be made enforceable.

- *Are they going to be explicitly required by regulation?*
- *Will there be a permit change requiring the installation and operation of the equipment at defined control efficiencies?*

NDEP Response:

Appendix A of Nevada's Regional Haze SIP presents Nevada's BART regulation as adopted by the State Environmental Commission and effective April 23, 2009. The regulation specifies emission limit and control type for each subject-to-BART unit of the four subject facilities in Nevada. In response to public comments, Nevada is revising the SO₂ BART emission limits at NV Energy's three subject-to-BART units at Reid Gardner. The proposed regulation appears in Appendix A. The re-evaluation and revision of the Reid Gardner SO₂ emission limits is described in our response to USEPA comment 2 below.

Title V permits for the subject facilities will be updated to include the new applicable requirements in accordance with Part 70 procedures (see SIP section 5.5). Permits will be updated to reflect Nevada regulation as written and approved. However, the permit will not require the operation of equipment at defined control efficiencies, but rather at defined emission limits.

EPA Comment 2:

We are also concerned about the 0.25 lb/MMBtu SO₂ limit proposed as the BART determination for Reid Gardner. It appears to be substantially higher than the emission rate the plant is currently achieving. The National Park Service and Fish and Wildlife Service (NPS-FWS) determined that, based on the acid rain database, the plant is currently achieving 0.05 lb/MMBtu on an annual average basis. Setting the 24-hour limit five times higher than the achieved annual emission rate seems to exceed what is required to account for normal operational variability. As a result, it may allow for changes that would result in higher actual emissions.

- *Do you concur with the NPS-FWS analysis of the annual emission rate? If not, the EPA would like to see an explanation of your position in sufficient quantitative detail for an outside party to replicate your analysis.*
- *How will Nevada ensure that the proposed 24-hour SO₂ limit will not result in actual emission increases from this plant on a 24-hour basis and/or on an annual basis?*

NDEP Response:

Nevada believes this comment refers to NPS comments submitted March 6, 2009 on the FLM review draft of Nevada's RH SIP. The NPS commented on Nevada's Reid Gardner BART determination for SO₂ and the USEPA Clear Air Markets (CAM) database (aka acid rain database). NDEP has identified annual average SO₂ emission rates of approximately 0.05 lb/MMBtu (0.035 to 0.056 lb/MMBtu) for units 1, 2, and 3 for 2004 through 2007 based on the acid rain database, as did the NPS.

However, NDEP initially reached different conclusions from NPS-FWS regarding the use of these data in the BART determination, as presented in Nevada's RH SIP and appendices. NV Energy and NDEP had significant concerns regarding achievable emissions limits resulting from the operation of the wet soda ash FGD in conjunction with fabric filters required by the consent decree described in section 6.5.2.2 of the SIP. In consideration of this uncertainty, the BART SO₂ limit was established at the 98th percentile of historical annual emissions value resulting in a limit of 0.25 lb/MMBtu. This limit allowed for future operation within 98 percent of historical emissions (after discard of the invalid data) and provided some flexibility during transition to a different post-BART operating scenario including operation under a balanced draft versus force draft scenario due to the installation of the fabric filter and a potential change in coal type. NDEP notes the SO₂ BART limits are 24-hour averages and therefore less stringent than limits based on longer duration averaging periods.

Baghouses (fabric filters) were installed upstream of the existing FGD system in late 2008 and early 2009 as required by the consent decree. So, a limited emissions dataset now exists representing the performance of the FGD system coupled with baghouses. In light of this comment by USEPA and concerns expressed by the FLMs and NGOs, NDEP conducted further evaluations of NV Energy's BART analyses and the emissions data. NDEP recognizes that the acid rain data is not a compliance dataset, however emissions data collected under 40 CFR Part 60 is utilized to demonstrate compliance. Evaluation of the Part 60 data collected since the installation of the baghouses provides a level of confidence that Reid Gardner can achieve a BART SO₂ emission limit of 0.15 lb/MMBtu, 24-hour average, for all three BART units without jeopardizing compliance.

In response to this comment, Nevada is revising the BART requirements at NV Energy's Reid Gardner Generating Station. A regulatory amendment lowering the SO₂ emission limits for units 1, 2 and 3 from 0.25 to 0.15 lb/MMBtu, 24-hour average, has been submitted to the State Environmental Commission for presentation at their December 9, 2009 Hearing. See Appendix A for additional details. NDEP has also revised text, figures and tables in this SIP as well as text in NDEP's BART determination review of Reid Gardner to reflect this change in emission limits and its ramifications to annual emissions reductions and visibility improvement resulting from BART. Specifically changes were made to the Executive Summary, Chapter 5 (sections 5.5 and 5.6), Chapter 6 (sections 6.5.2.2 and 6.7), Chapter 7 (sections 7.2 and 7.9.1.1), Appendix A and Appendix B.

Although there is no specific regulatory requirement for the installation of BART to reduce emissions, NDEP is confident actual emissions from Reid Gardner will not increase as a result of the SO₂ BART emission limit. Reid Gardner has been operating at its current SO₂ emission levels for some time. The subject-to-BART units at Reid Gardner are already very well

controlled for SO₂ by the existing wet soda ash flue gas desulfurization (FGD) system. Units 1, 2 and 3 are 30 to 40 years old, but are among the best performing SO₂ controlled units in the nation. NDEP does not want to penalize NV Energy for the historic highly-efficient operation of Reid Gardner by imposing emission limits that may lead to periods of noncompliance.

NDEP is confident that these units will continue to be operated in their highly-efficient historic manner and does not see the need to impose an additional limit outside of regulatory guidance until operational history is established under the new scenario. The operational characteristics of the existing FGD controls will be maintained in a highly efficient manner following the implementation of BART. In fact, filter fabric installation, as part of BART, will reduce particulate loading and lessen plugging of the scrubber trays and nozzles, which should result in improved liquid distribution and SO₂ removal as well as result in increased reliability. Note that the BART SO₂ emission limit is a 24-hr average and therefore less restrictive than limits that might be based on longer averaging times. NDEP is confident that the BART SO₂ emission limit is not only legally enforceable, but also practically enforceable and actual annual emissions will not increase.

Emissions from Reid Gardner, as well as other sources will be reviewed under the auspices of reasonable progress for the 2018 SIP update. NDEP has added explanatory text to NDEP's BART Review documents and Chapter 5 of Nevada's regional haze SIP as a result of this and related comments from the FLM community.

This comment is similar to NPS comments 9 and 10, presented in the next section. See NDEP's responses in section 2.2.3.2 below for additional discussion.

SECTION D.2.2.3

U.S. DEPARTMENT OF INTERIOR, NATIONAL PARK SERVICE

2.2.3 U.S. Department of Interior, National Park Service

2.2.3.1 Comment Letter



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE

Air Resources Division

P.O. Box 25287

Denver, CO 80225



May 20, 2009

N3615 (2350)

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JUN 26 2009

ENVIRONMENTAL PROTECTION

Adele King Malone, ES IV, Supervisor
Planning Branch, Bureau of Air Quality Planning
Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701

Nevada
Environmental Protection

JUN 29 2009

BAPC/BAOP

Dear Ms. Malone:

Thank you for providing your April 17, 2009 responses to our comments, and for inviting additional comments. We are providing additional comments on the Reid Gardner Generating Station, Fort Churchill Generating Station, and the Tracy Generating Station, as well as follow-up comments (to your previous comments and your responses). We ask that you include these comments in your public record regarding Nevada's *Draft Regional Haze State Implementation Plan* (RH SIP).

We commend NDEP for its determinations that BART represents emission limits that are more-stringent than proposed by Nevada Energy (NVE). However, we believe that even greater emission reductions can be reasonably achieved under the BART program, and that greater visibility improvements can therefore be realized.

The core purpose of the Best Available Retrofit Technology (BART) program is to improve visibility in our Class I areas. BART is not necessarily the most cost-effective solution but, instead, represents a broad consideration of technical, economic, energy, and environmental (including visibility improvement) factors. We believe that it is essential to consider both the degree of visibility improvement in a given Class I area as well as the cumulative effects of improving visibility across all of the Class I areas affected.

The BART Guidelines require that NDEP consider the effects of the technically feasible options on visibility. Because there are no "traditional measures of cost effectiveness," to rely upon in this context, we have suggested that cost per deciview (\$/dv) can be a useful metric in doing so. (It appears that Nevada Energy and NDEP must also find some value to this metric, as they both presented \$/dv values in their BART analyses.) And, if NDEP were to inspect the information we provided to it recently in our compilation of BART

proposals,¹ it would find that \$/dv is being used by many other states and BART sources. Finally, we believe that the \$/dv metric inherently addresses the concern expressed by NDEP regarding its uncertainty about “how the number and placement of Class I areas with respect to the facility may affect the usefulness of \$/deciview as an effectiveness measure”—the calculation of the impact in dv is directly related to the relative locations of the source and the Class I area, and the cost value is completely objective and fits the “traditional” approach that NDEP desires.

NDEP is correct in noting that the EPA BART Guidelines allow it to “choose not to analyze the other Class I areas any further as additional analyses might be unwarranted.” However, we believe that it is good public policy to at least consider the consequences of that choice. If the other Class I areas were so distant as to be essentially unaffected, NDEP’s choice could be justified. However, a simple inspection of the modeling results presented by Nevada Energy (NVE) shows that, by evaluating impacts only at the closest Class I area, NDEP has ignored from 50% to 90% of the cumulative impacts at the Class I areas for which results are presented. Thus, NDEP has also ignored 50% to 90% of the benefits that would result from any reductions in emissions at these facilities.

NVE’s costs presented for each control technology were taken at face-value and used in NDEP’s BART determination. However, the BART guidelines advise that:

The basis for equipment cost estimates also should be documented, either with data supplied by an equipment vendor (i.e., budget estimates or bids) or by a referenced source (such as the OAQPS Control Cost Manual, Fifth Edition, February 1996, EPA 453/B-96-001). In order to maintain and improve consistency, cost estimates should be based on the OAQPS Control Cost Manual, where possible.

Our belief that the Cost Manual should be the primary source for developing cost analyses that are transparent and consistent across the nation and provide a common means for assessing costs is further supported by this November 7, 2007, statement from EPA Region 8 to the North Dakota Department of Health:

The SO₂ and PM cost analyses were completed using the CUECost model. According to the BART Guidelines, in order to maintain and improve consistency, cost estimates should be based on the OAQPS Control Cost Manual. Therefore, these analyses should be revised to adhere to the Cost Manual methodology.

We believe that this guidance from EPA should persuade NVE and NDEP to revise their cost analyses to reflect a more-consistent use of the Cost Manual, or, at least, better support and document their estimates.

As we suggest above, we believe that greater emphasis should be placed upon the degree of visibility improvement that could be achieved in this program designed for that specific purpose. It follows that, if it is cost-effective to spend \$10 million per dv to apply Low-NO_x Burners plus Flue Gas recirculation at Tracy Unit #3, then application of that same criterion to the other proposals would result in determinations that lower emission rates could be achieved. We also suggest that, if NDEP were to consider the cumulative benefits that could be achieved at this \$10 million/dv benchmark, the scope of BART and the resulting degree of emission reductions would be still greater.

¹ Our compilations of BART proposals can be found at <http://www.wrapair.org/forums/ssjf/bart.html>

In our review of BART analyses across the nation, it has become apparent that some states take the approach that, if any of the factors it uses to evaluate a BART option is unfavorable, it rejects that option, regardless of how favorable the other factors may be. On the other hand, we believe that the purposes of the BART program would be better-served if states would take a more-positive approach and conclude that, if any of the critical factors for a given BART option is favorable, then that option should be accepted. For example, if we accept that achieving visibility improvement in a cost-effective manner is the overarching premise of the BART program, then \$/dv of improvement becomes the primary factor. Our review of BART proposals by states and sources across the nation has found that the mean \$/dv for controlling NO_x is \$10 million/dv, which is consistent with the \$9.8 million/dv accepted by NDEP for BART at Tracy Generating Station Unit #3.

We look forward to working with the Nevada Division of Environmental Protection as this process advances. We believe that good communication and sharing of information will help expedite this process, and suggest that you contact Don Shepherd (don_shepherd@nps.gov, 303-969-2075) if you have any questions or comments about this document.

Sincerely,



John Bunyak
Chief, Policy, Planning and Permit Review Branch

Enclosures

cc:

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NPS Follow-Up Comments on NDEP BART Determinations

COMMENT 6 (FS): We believe a shorter averaging period needs to be defined for NO_x limits.

NDEP response: The 12-month rolling averages were used for the NV Energy units to provide operational flexibility for sources.

NPS follow-up: The BART program is designed to set emission limits to protect and improve visibility, which is a transitory, short-term attribute. NDEP should facilitate the goals of the BART program by regulating short-term emissions of NO_x, a pollutant that significantly impairs visibility in the area.

COMMENT 7 (NPS-FWS p.5): The core purpose of the BART program is to improve visibility in our Class I areas. BART is not necessarily the most cost-effective solution but instead, BART represents a broad consideration of technical, economic, energy, and environmental (including visibility improvement) factors. We believe that it is essential to consider both the degree of visibility improvement in a given Class I area as well as the cumulative effects of improving visibility across all of the Class I areas affected.

NDEP response: NDEP did consider the incremental costs for the various proposed control strategies and we recognize the limitations of this method. However, NDEP evaluated the control cost, incremental cost, and capital cost in combination and used a "least-cost envelope" to identify dominant alternatives by generating graphical plots of total annualized costs for total emissions reductions for all control alternatives identified in the BART analysis consistent with Appendix Y, Part IV(D)(4)(e)(2). We then considered the breaks in the combined economic factors to identify the BART control technology for further evaluation. The cost data from the NV Energy facilities is presented in Table 1, attached.

NPS follow-up: It appears that NDEP has based its BART determinations upon three factors, **capital cost**, **cost per ton**, and **incremental cost per ton**. NDEP cites the \$8 million capital cost of ROFA+Rotamix at Reid Gardner Generating Station (RGGGS) as one example of a parameter it considered. This is the highest capital cost of any NO_x control strategy accepted by NDEP. Use of this cap on capital cost improperly excludes controls that may be more effective on other bases (e.g., \$/ton, \$/dv) but higher because they would be applied to larger sources. We therefore recommend against use of capital cost.

We agree that cost per ton and incremental cost per ton are appropriate factors, and note that **NDEP determined that an average of \$3,050/ton was an acceptable cost for Low-NO_x Burners (LNB) and Flue Gas Recirculation (FGR) at Tracy Generating Station (TGS) Unit #1, and that \$4,972 per ton was an acceptable incremental cost for LNB+FGR at TGS Unit #2.** However, we continue to advise against over-reliance upon incremental cost. First, it is generally understood that the cost/ton of pollution

control is an exponential function with an increasing slope as higher control efficiencies are approached. Thus, the incremental cost of moving from lower control to higher control will increase as higher control efficiencies are sought. One way to deal with this problem is to look not at the absolute values of the incremental cost, but to the relative ratios of the incremental costs.

The incremental cost evaluation problem is apparent at Fort Churchill Generating Station (FCGS) where the incremental cost ratio of the LNB+FGR strategy chosen by NDEP is 2.7 times the next-lowest-\$/ton strategy (LNB). However, NDEP rejected the LNB+SCR strategy, even though its relative incremental cost ratio was only 2.0.

At RGGGS, NDEP rejected any strategy with a relative incremental cost ratio greater than 1.1.

Although NDEP did not explain how it considered the importance of actually relating costs to visibility improvement for this visibility improvement program, we also note that **NDEP found that a cost of \$9.8 million/dv was acceptable for addition of LNB plus Selective Non-Catalytic Reduction (SNCR) at Tracy #3.**

Applying this **\$9.8 million/dv “benchmark”** to the Nevada BART sources and using the NDEP data in its Table #1 produces the following conclusions for BART:

- At Tracy #1, BART is LNB+FGR as proposed by NDEP.
- At Tracy #2, BART is LNB+FGR as proposed by NDEP.
- At Tracy #3, BART is LNB+SNCR as proposed by NDEP.
- At Ft. Churchill #1, BART is LNB+FGR as proposed by NDEP.
- At Ft. Churchill #2, BART is LNB+FGR as proposed by NDEP.
- At Reid Gardner #1, BART is LNB +SCR.
- At Reid Gardner #2, BART is LNB +SCR.
- At Reid Gardner #3, BART is LNB +SCR.

If we use NDEP’s determinations that an average of **\$3,050/ton** was an acceptable cost for LNB+FGR at TGS Unit #1, and that a cost of **\$9.8 million/dv** was acceptable for addition of LNB+SNCR at TGS #3 as our criteria, we arrive at the same results.

On average cost/ton and cost/dv bases, LNB+SCR is clearly BART at all three RGGGS units. Despite NDEP’s assertion that it did not rely solely upon incremental costs, it appears that the only way NDEP can justify rejecting LNB+SCR at RGGGS is on that basis. NDEP should clearly state the basis for its BART determinations, and how it included effects on visibility.

COMMENT 8 (NPS-FWS p.5-6): NDEP does not appear to have given much weight to the visibility benefits that could be realized from the control strategies evaluated. At least, it is not clear how NDEP applied this factor in developing its BART conclusions. There appears to be great inconsistency among the costs and visibility benefits that would result from the various control strategies chosen by NDEP as representing BART.

NDEP response: NDEP has consistently evaluated the economic factors as part of our evaluation of proposed BART controls on a unit-by-unit basis, as described in our response above. As USDOJ pointed out in their initial comments above, NDEP has identified BART controls more stringent than those proposed by the facilities. One of the results of this decision is a lack of additional modeling results, which has somewhat hampered our evaluation of visibility improvement due to the various proposed BART control scenarios.

However, Table 5-4 in each of NV Energy's BART analysis reports compares the modeled visibility improvement for each proposed NO_x control scenario at the closest Class I area. These data were considered by NDEP in our evaluation of BART controls consistent with guidance provided in Appendix Y, Part IV(D)(5), which states, in part "If the highest modeled effects are observed at the nearest Class I area, you may choose not to analyze the other Class I areas any further as additional analyses might be unwarranted." These tables show clear breaks in visibility improvement, annualized costs, and cost per deciview reduction, paralleling those reflected by the cost factors. All of these data were considered in NDEP's identification of BART. Table 1, attached, compiles and presents the cost and visibility improvement data considered by NDEP.

The modeling conducted by NV Energy does not always reflect the BART emission limits proposed by NV Energy, especially for NO_x and PM₁₀. NV Energy's consideration of NDEP's comments regarding their initial identification of BART limits resulted in NV Energy identifying more restrictive NO_x emission limits in their final BART analysis reports. However, these more restrictive limits were not modeled, nor were the emission rates NDEP identified as BART. NV Energy's reports identify the BART emission limits proposed by NV Energy (see the Recommendations section of each BART analysis report) as well as the modeled emission rates (see Table 5-1 of each BART analysis report).

Chapter 5, Table 5-8 of Nevada's regional haze SIP, identifies the differences in emissions modeled by NV Energy and the emissions based on the BART controls identified by NDEP. Section 5.6 discusses the visibility improvement resulting from BART implementation in 6 Nevada. In general, there is a linear relationship between CALPUFF modeled visibility and emission rates. The visibility improvement resulting from BART installation is expected to be proportional to the difference in modeled annual emissions and the annual NDEP BART emissions. No changes were made to the SIP as a result of this comment.

NPS follow-up: NDEP should present evidence to support its assertion that "NDEP has consistently evaluated the economic factors as part of our evaluation of proposed BART controls on a unit-by-unit basis..." NDEP explains that it used three factors (capital cost, average cost per ton, and incremental cost per ton), but does not tell how, or with what criteria, it applied them. As we noted in our previous follow-up, it appears that a consistent application of its criteria would have led to very different determinations. If NDEP lacked the modeling analyses it needed to produce an informed determination, it should have first obtained that information.

NDEP is correct in noting that the EPA BART Guidelines allow it to “choose not to analyze the other Class I areas any further as additional analyses might be unwarranted.” However, we believe that it is good public policy to at least consider the consequences of that choice. If the other Class I areas were so distant as to be essentially unaffected, NDEP’s choice could be justified. However, a simple inspection of the modeling results presented by NV Energy shows that, by evaluating impacts only at the closest Class I area, NDEP has ignored from 50% to 90% of the cumulative impacts at the Class I areas for which results are presented. Thus, NDEP has also ignored 50% to 90% of the benefits that would result from any reductions in emissions at these facilities.

NDEP points to the “clear breaks” in the NV Energy Table 5-4 results as proof that the more-stringent controls are too expensive. As we noted earlier, BART is not necessarily the most-cost-effective option. And, as we have shown above, those “clear breaks” can be misleading unless placed into the proper perspective. We continue to disagree that this should be a determining factor if the more-stringent controls are still reasonably cost-effective.

We agree with NDEP that, “In general, there is a linear relationship between CALPUFF modeled visibility and emission rates. The visibility improvement resulting from BART installation is expected to be proportional to the difference in modeled annual emissions and the annual NDEP BART emissions.” However, if one inspects the results in NV Energy’s Table 3-2 for NO_x reductions and Table 5-4 for visibility improvement, it can be seen that, if, for example, a 95 ton per year reduction due to LNBw/OFA at RGGS #3 produces an improvement of 0.407 dv at Grand Canyon, then a reduction of 1,136 tons per year after application of LNBw/OFA+SCR should produce more than the 0.652 dv improvement presented by NV Energy.¹ If NDEP is to use the NV Energy data, it must insure that the data is valid and that it is properly presented and interpreted. It is apparent that the NVE data that NDEP is using requires further explanation, at the very least.

COMMENT 9 (NPS-FWS p.6): Comments on Reid Gardner BART Determination, Sulfur Dioxide (SO₂). In view of the extremely low (0.05 lb/mmBtu) actual annual SO₂ emissions presented in the US EPA Clean Air Markets (CAM) database, we note that the limit could better reflect the lower actual emissions.

NDEP response: Although the proposed BART SO₂ emission rates for Reid Gardner are higher than baseline emissions (in lb/mmBtu), NDEP has identified SO₂ BART controls for Reid Gardner in consideration of the CAA factors, as well as uncertainties in future coal supply for this facility and changes in boiler operation from the current pressurized operation to balanced draft operation. NDEP has opted for a less stringent BART emission limit to provide operational flexibility during this time of transition and to ensure the limits are achievable under the new operating scenario.

¹ Similar inconsistencies can be found throughout the Reid Gardner analyses. For example, the NVE model results indicate that a one ton/yr reduction by LNB will improve visibility 7.5 times as much as a one ton reduction resulting from LNB+SCR.

NDEP notes that Reid Gardner has been operating at its current emission levels in absence of a permit limit for SO₂. It is the nature of the scrubbers and the operation of such that has led to these unprecedented low annual emissions from units of their age. NDEP is confident that these units will continue to be operated in their highly-efficient historic manner and do not see the need to impose an additional limit outside of regulatory guidance until operational history is established under the new scenario. Emissions from Reid Gardner, as well as other sources will be reviewed under the auspices of reasonable progress for the 2018 SIP update. NDEP has added explanatory text to NDEP's BART Review documents and Chapter 5 of Nevada's regional haze SIP as a result of this comment.

NPS follow-up: Reid Gardner is subject to BART, and BART is a federally-enforceable emission limit. NDEP should provide the 98th percentile values on which it based its BART limit. And, because NDEP believes that operating conditions and/or coal quality will change, it should identify those changes and include them in its analysis so that those assumptions can be evaluated by others.²

COMMENT 10 (NPS-FWS p.6): It is our understanding that the proposed 24-hour limit would become the most stringent SO₂ limit applicable to this facility. As a consequence, there appears to be no other constraint on RG that would prevent it from operating continuously at that emission limit, and this could result in substantially higher annual emissions. However, a limit that reflects good utilization of the existing scrubbers would not require scrubber upgrades or incur additional costs, but would also prevent emissions from increasing. In addition to a more-stringent 24-hour limit, we also suggest that an annual limit (e.g., 0.06 lb/mmBtu) be included that reflects the normal clean operation of this facility.

NDEP response: NDEP will duly consider this comment during permitting associated with Reid Gardner's BART control installation. No changes have been made to the regional haze SIP due to this comment.

NPS follow-up: NDEP should duly resolve this during the BART process.

COMMENT 12 (NPS-FWS p.7): We also request an analysis of controls for condensable PM₁₀ which can represent a substantial component of total PM₁₀ emissions, and can thus affect visibility.

NDEP response: Comprehensive review of 40 CFR Part 51 (Appendix Y) has not identified specific reference to control of condensable particulate matter under BART. The Guidelines do make reference to direct particulate matter emissions for determining whether sources cause or contribute to visibility impairment. In addition, no guidance has been provided on how to evaluate whether condensable PM₁₀ is a significant component of particulate matter that causes or contributes to visibility impairment at any Class I area.

² NDEP should also explain why such changes in operations would not trigger new source review requirements.

Additionally, at this time there is no post-combustion technology to directly control condensable particulate emissions. Condensable emissions can be controlled through application of combustion controls and the control of precursors of condensable particulate emissions, the primary constituents of which are oxides of nitrogen and sulfur. The post combustion control of both these oxide species have been discussed with appropriate BART limits applied. No changes were made to the SIP text as a result of this comment.

NPS follow-up: Condensible PM is generally understood to be a significant component of PM emissions from fossil-fuel-fired EGUs, and the CALPUFF model used by NV Energy to model emissions is capable of, and was used for modeling condensible PM emissions. NDEP is incorrect in its assertion that “there is no post-combustion technology to directly control condensable particulate emissions.” Wet electrostatic precipitators are commonly installed for this purpose, and reagents have been recently developed to suppress the formation of SO₃ which leads to emissions of H₂SO₄.

COMMENT 13 (NPS-FWS p.7): Nitrogen Oxides (NO_x). We are pleased that, by proposing addition of Rotating Over-Fire Air (ROFA) with Rotamix, NDEP is moving beyond the combustion controls proposed by NVE. However, NDEP is proposing a higher NO_x limit for RG Unit #3 than for units #1 and #2, even though the CAM data show that RG Unit #3 has the lowest current emission rate among the units at the plant. We request a justification of why higher NO_x emissions, and therefore lower control efficiencies, are proposed for Unit #3.

NDEP response: NV Energy discusses control cost and expected emission information in their BART Analysis for Reid Gardner Station Unit 3 report under Establishing Emission Reduction Levels from BART Analysis Results in the Executive Summary. This text describes the difficulty in securing cost estimates and vendor guarantees without contracts.

NDEP utilized the control efficiency data presented by NV Energy with the associated caveats reproduced above. The higher emission rates for Unit 3 are further explained in NDEP’s response to the next USDOJ comment which explains the use of different baseline emissions (in lb/mmBtu) as the starting point for calculation of emission limits. In addition, NDEP generally lends latitude to the experienced operators of a given facility. They understand the operational history and idiosyncrasies of a given unit. Therefore, NDEP had no reason to question the higher NO_x control efficiencies for one unit over the other. It is also beneficial to understand that these units were not constructed at the same time, and even if they were, identical units have been proven to not operate identically. No changes were made to the SIP text as a result of this comment.

NPS follow-up: While true, the generalities presented by NDEP do not address the question of why a specific boiler (RGGS #3) should be allowed to emit more NO_x after installation of similar BART controls than similar boilers at RGGS with higher pre-BART emissions and similar BART controls. And, we still do not see how the higher emission rates for RGGS Unit 3 are further explained in NDEP’s response to the next USDOJ comment.

COMMENT 14 (NPS-FWS p.7): NVE and NDEP have assumed that combustion controls can achieve NO_x reductions in a range of 6 to 24 percent. Our data (provided in Appendix A) on BART sources and/or states proposing combustion controls indicates that typical NO_x reduction efficiencies range between 15 and 63 percent. We request that NDEP review the effectiveness assumptions in its BART determination and provide support for variations from engineering norms.

NDEP response: NV Energy has proposed combustion controls for Reid Gardner with NO_x control efficiencies ranging from 6 to 24 percent for LNB with OFA and 38 to 59 percent for ROFA with Rotamix. The corresponding emission limits are 0.355 to 0.421 lb/mmBtu and 0.191 to 0.278 lb/mmBtu, respectively. Appendix A, provided by USDO, lists proposed combustion controls with efficiencies ranging from 15 to 63 percent and emission limits of 0.15 to 0.43 lb/mmBtu. It is Nevada's position that the effectiveness assumptions presented by NV Energy do not vary significantly from engineering norms based on the information presented by USDO. Therefore, no additional support materials will be provided. No changes to the SIP text were made as a result of this comment.

NPS follow-up: We disagree that "...assumptions presented by NV Energy do not vary significantly from engineering norms..." Differences between 6% and 15% control, and between 24% and 63% control are significant. Good combustion controls are the foundation for any NO_x reduction strategy. If that foundation is not strong, then the add-on controls will be hampered in their effectiveness and their costs will increase.

COMMENT 15 (NPS-FWS p.7): NDEP has assumed that control of NO_x through a combination of combustion controls and Selective Catalytic Reduction (SCR) technologies could reduce NO_x emissions to 0.085 lb/mmBtu, resulting in a 77 percent reduction of potential emissions. Our review of eastern coal-fired Electric Generating Units (EGUs) retrofitted with SCR indicates that those EGUs can achieve 0.06 lb/mmBtu on a 30-day rolling average basis while they are in operation. We note that Nevada Energy assumed that these controls could achieve an emission rate of 0.07 lb/mmBtu for its cost and air quality modeling analyses. We request that NDEP review its assumption regarding achievable emissions limits for a combination of combustion controls and SCR and provide support for any annual rate higher than 0.06 lb/mmBtu.

NDEP response: As described in Chapter Five, section 5.5 Summary of BART Control Analyses, NDEP evaluated CAM and other emissions data to determine baseline emissions in lb/mmBtu. These data are tabulated in Table 1 of NDEP's BART Determination Reviews. Appendix A of NV Energy's BART analysis reports presents similar data. Note the differences in annual heat input and NO_x emissions, 9,048,563 mmBtu and 1452 tons by NV Energy and 10,063,851 mmBtu and 2268 tons by NDEP, for Reid Gardner Unit 3. Analysis of these data demonstrate that the uncontrolled emission rate using NV Energy's baseline is 0.32 lb/mmBtu while it is 0.45 lb/mmBtu using NDEP's baseline. The emission rates calculated by applying the control efficiencies provided by NV Energy are 0.07 lb/mmBtu and 0.098 lb/mmBtu, respectively. Thus, the proposed emission rates are calculated from the control efficiencies, which NDEP has confirmed are within engineering norms, based on data provided by USDO (see NDEP

response to comment above). No changes were made to the SIP text as a result of this comment.

NPS follow-up: NDEP has based its analyses of the costs of combustion controls plus SCR on the assumptions that this combination of controls can achieve annual emission rates no lower than 0.083 – 0.098 lb/mmBtu. It appears that NDEP arrived at these emission rates counter to the approach used by NVE in which NVE estimated the emission rate that was achievable and then calculated the corresponding reduction efficiencies. Although we believe that NVE has underestimated the ability of SCR to achieve lower emissions, we agree with its approach and it the approach taken by the overwhelming majority of BART sources across the nation.

Instead, NDEP used the “artificially” calculated control efficiencies that resulted from NVE’s emission estimates, and then applied those artificial values to its escalated baseline emission and heat input scenarios. As a result, not only are the NDEP emission rates higher than the 0.07 lb/mmBtu rate presented by NVE, they are higher than the emission rates demonstrated in practice (**as illustrated by the updated CAM data we are submitting**) and higher than the vendor guarantees.³ NVE and NDEP should re-evaluate SCR on the basis that it can achieve an annual emission rate of 0.05 lb/mmBtu.

COMMENT 16 (NPS-FWS p.7-8): The capital costs noted for the combination of combustion control and SCR are \$278 per kilowatt (kW) of energy output. Those costs are higher than any real-world costs found in available literature. We did not find any facility-specific information in the SIP record that supports these costs, nor was there any indication that RG would experience any exceptional BART retrofit costs. As a result, the cost-effectiveness values noted in the NDEP BART analysis ranged from \$2,386 to \$2,600 per ton of NO_x removed. Nevertheless, those values are substantially lower than the \$3,778 per ton estimated by the North Dakota Department of Health for its proposed BART controls for NO_x emissions from Great River Energy’s Stanton facility that impacts only two Class I areas.

Using data found in the SIP documentation and US EPA Control Cost Manual approach (recommended by the BART Guidelines), we estimate cost (in Appendix D) to achieve an emission rate of 0.06 lb/mmBtu, representing 83 to 86 percent control efficiency on an annual-average basis, would result in cost of \$135 to \$163 per kW and a range of \$1,568 to \$1,752 per ton of NO_x removed. Our cost/kW is well within the range of real-world values cited above, and our cost per ton is similar to that accepted by NDEP for its proposed BART strategy, but with greater benefits to visibility. [footnote: Our cost estimates for SCR at RG are also lower than the BART strategies proposed by North Dakota for EGUs at Leland Olds, Stanton, and MR Young facilities (provided in Appendix E to our comments).] Based on our calculations, we believe that NDEP’s costs

³ For example, Minnesota Power has stated in its Taconite Harbor BART analysis that “The use of an SCR is expected to achieve a NO_x emission rate of 0.05 lb/mmBtu based on recent emission guarantees offered by SCR system suppliers.”

are overestimated and request that documentation of facility-specific conditions affecting cost be provided.

NDEP response: Nevada has evaluated this comment in light of the cost per kW data provided in Appendix C. NDEP notes the most recent cost data (2008) in the literature for the combination combustion controls and SCR are from ODEQ for Boardman and these costs are similar to those proposed for Reid Gardner (\$278/kW vs \$207-267/kW). The most recent “real-world” costs (see PSNM Survey of Appendix C) date back to 2006. In addition, Summary of Summaries in Appendix C shows average and median total capital investment of \$320 and \$301/kW for SCR and \$346 to \$334/kW for combustion control plus SCR. These costs were compiled by USDOJ from many sources/agencies and reflect costs higher than those proposed by NV Energy.

NPS follow-up: The Boardman costs represent an unusual situation in which a \$40 million capital cost would be included for modification of the boiler to reduce outlet temperatures to a range that would accommodate SCR.⁴ Unless NVE can show that it would experience unusual costs, then we believe that the cost values cited (and again included) are fair representations of typical SCR costs.

NDEP should also recognize that the “average and median total capital investment of \$320 and \$301/kW for SCR and \$346 to \$334/kW for combustion control plus SCR” is based almost entirely on data presented by sources that have rejected SCR, and thus have a large financial interest in convincing their regulatory agencies to agree. When we compare those industry estimates to the “real-world” data compiled for the Electric Power Research Institute and the Boardman reports, we suspect that the industry cost data to which NDEP referred are inflated. We hope that NDEP would exercise caution in evaluating data from sources with clear conflicts of interest. In addition, we suggest that NDEP consider the information presented by Minnesota Power to the Minnesota Public Utilities Commission in which it estimated that addition of SCR would cost \$205/kW at its Clay Boswell unit #3.

NDEP response: Although NDEP can concur with use of the EPA Control Cost Manual approach, NDEP has issue with the use of the “NPS version of corrected OAQPS Cost Manual...” spreadsheets included as Appendix D of the USDOJ comments. We do not concur with the use of a modified version of EPA’s Control Cost Manual for numerous reasons, the most obvious being that the modifications are unilateral by the FLM community and have not been properly vetted through a public process or formally accepted by USEPA. Therefore, we acknowledge the discussion of costs based on the modified Cost Manual and but do not address them.

NPS follow-up: It appears that NDEP has somehow concluded that our “NPS version of corrected OAQPS Cost Manual...” spreadsheets represent some radical revision of the EPA OAQPS Control Cost manual approach recommended by the BART Guidelines. Instead, the “correction” to which the file’s title refers is in the original version of that workbook that used the example problem in the Cost Manual as a check. In the process of

⁴ NDEP can learn more about this at <http://www.deq.state.or.us/aq/haze/pge.htm>

developing the workbook, it was discovered that some errors had occurred in the Cost Manual's presentation of its example, and those errors were corrected (with the cooperation of OAQPS). We suggest that NDEP become more familiar with the methods employed by the Cost Manual and the workbook based upon it. If NDEP then finds that there really is an error or deviation in the workbook, we would be pleased to work with NDEP (and OAQPS) to correct it.

We are unaware that the OAQPS Control Cost manual must be "properly vetted through a public process" in order for NDEP to accept the science inherent in its methods. And, while we have made our workbook available to all as an aid toward evaluating the costs of SCR, if NDEP wishes to use a different approach, it is welcome to do so, provided that it presents adequate rationales, explanations, and justification.

NDEP response: NDEP believes the BART costs proposed by NV Energy are not overestimated but are in line with other proposals across the nation (when compared with those listed in Appendix C) and it is therefore not necessary to provide additional documentation of facility-specific conditions affecting cost. NDEP has provided text from NV Energy's BART Analysis Reports (see NDEP response to the first USDOJ comment under Nitrogen Oxides) identifying the problems with securing cost and emission data from vendors without formal contracts in place.

NPS follow-up: The data available to NPS lead us to believe that costs for a typical SCR installation range from \$50 – 250/kW. NVE has provided no documentation or justification for its much higher costs. If NVE cannot provide the documentation and justification to support its estimates, then it should use the Cost Manual approach to generate estimates that are consistent and transparent. We are simply doing exactly that.

NDEP response: It is also our position that the selection of BART is specific to the individual facility based on expected emission rate, emissions performance level, expected emissions reductions, costs of compliance, energy impacts, non-air quality environmental impacts and modeled visibility impacts. Control costs at other facilities with their unique circumstances should not be a controlling factor in the selection of BART. No changes were made to the SIP text as a result of this comment.

NPS follow-up: We believe that BART decisions should be made in the context of other decisions made by a particular state, and in the context of decisions made by other states, in much the same manner as Best Available Control Technology determinations. This promotes the concept of the "level playing field." We also encourage states to consider the unique circumstances particular to a given source and its impacts upon Class I areas in its vicinity. At the very least, a state should be internally consistent in its determinations, or provide information describing any apparent inconsistencies.

COMMENT 17 (NPS-FWS p.8): We are especially concerned that the NDEP BART analysis did not address improvements in visibility in a quantitative manner, for example, by comparing the various RG control alternatives to the costs and benefits inherent in the BART proposals by other states and/or sources. In its BART analysis, NVE estimates

that aggressive NO_x controls (ROFA+SCR or combustion controls+SCR) at RG result in about 0.7 deciview (dv) improvements at Grand Canyon National Park. As presented in NVE's BART analysis, that equates to approximately \$7 million per dv of improvement. Even just considering the one Class I area for which benefits were estimated, and accepting the (likely overstated) costs and underestimated benefits presented by NVE, the costs per unit of visibility improvement for the ROFA/combustion control plus SCR scenario at RG are well within the range of what was selected or proposed for BART controls at EGUs in other states. Our ongoing analysis of BART proposals from around the US (provided in Appendix E) are leading us to the conclusion that a cost per dv of \$10 - \$20 million represents a reasonable average cost-effectiveness for improving visibility at the most-impacted Class I area. (NDEP has determined that Low-NO_x Burners plus Flue Gas recirculation represent BART for Tracy Unit #3. NVE estimated, in its BART submittal, that this option would result in a cost-effectiveness value of \$10 million per dv.) The NVE analysis suggests that, at \$7 million per dv, RG could install the ROFA/combustion control plus SCR scenario at a much more favorable cost-per-dv effectiveness ratio than the typical state or EGU proposing BART. Furthermore, our estimates (on the Appendix D "Gardner (NPS)" page) of more visibility improvement from increased efficiency of the equipment and lower costs equate to a \$3 million cost per dv of improvement at Grand Canyon National Park alone.

NDEP response: NDEP has determined that additional modeling beyond the efforts of NV Energy is unwarranted, since the highest modeled effects are observed at the Class I area nearest the facilities [see Appendix Y Part IV(D)(5)], as discussed in our response to USDOI comments above. Tabulated model results, shown on attached Table 1, clearly identify breaks in the visibility impacts (both number of days and percent deciview reduction), total annualized costs and \$/dv reduction consistent with the breaks observed in the cost factors.

NPS follow-up: Although NDEP did not address our comments, it is correct in noting that the EPA BART Guidelines allow it to "choose not to analyze the other Class I areas any further as additional analyses might be unwarranted." However, we believe that it is good public policy to at least consider the consequences of that choice. If the other Class I areas were so distant as to be essentially unaffected, NDEP's choice could be justified. However, a simple inspection of the modeling results presented by NV Energy in Table 5-3 of its submittals shows that, by only evaluating impacts at the Grand Canyon, NDEP has ignored half of the cumulative impacts at the five Class I areas for which results are presented. Thus, NDEP has also ignored half of the benefits that would result from any reductions in emissions at RGGS.

NDEP response: NDEP takes exception to the statement "...accepting the (likely overstated) costs and underestimated benefits...". Nevada has demonstrated, using data provided by USDOI, that the control costs are in line with BART proposals at a variety of facilities across the nation, as are the control efficiencies and emission limits. The demonstrations were provided as NDEP responses to USDOI comments above.

NPS follow-up: We disagree and suggest that NDEP reconsider the cost information provided by NVE by taking a fresh look at the data we have provided,⁵ as well as its background. While it is true that it is the role of the states (or EPA when the state fails) to establish BART, that does not preclude DOI from concluding that NDEP should re-evaluate what constitutes reasonable average cost effectiveness. We would be pleased to share any additional information we have, if NDEP wishes to pursue this.

NDEP response: NDEP does not subscribe to the use of \$/dv as a measure of cost effectiveness as this is an optional measure [from Appendix Y Part (V) (1) (4) "...and/or any other cost-effectiveness measures (such as \$/deciview);..."] beyond the use of annualized costs, cost effectiveness, and incremental cost effectiveness. EPA has provided no guidance on the use of \$/deciviews as a cost effectiveness measure and NDEP is concerned that it may be misused in that role. NDEP is unsure how the number and placement of Class I areas with respect to the facility may affect the usefulness of \$/deciview as an effectiveness measure and therefore rely on the traditional measures of cost effectiveness. In addition, it is not the place of USDOJ to conclude what constitutes reasonable average cost effectiveness. That is the role of states.

NPS follow-up: The BART Guidelines require that NDEP consider the effects of the technically feasible options on visibility. Because there are no "traditional measures of cost effectiveness," to rely upon in this context, we have suggested that \$/dv can be a useful metric in doing so. (It appears that NV Energy and NDEP must also find some value to this metric, as they both presented \$/dv values in their BART analyses.) And, if NDEP were to inspect the information we provided to it recently in our compilation of BART proposals, it would find that \$/dv is being used by many other states and BART sources. And, we believe that the \$/dv metric inherently addresses the concern expressed by NDEP about its uncertainty about "how the number and placement of Class I areas with respect to the facility may affect the usefulness of \$/deciview as an effectiveness measure"—the calculation of the impact in dv is directly related to the relative locations of the source and the Class I area, and the cost value is completely objective and fits the "traditional" approach that NDEP desires.

NDEP response: Finally, we cannot concur with the use of a modified Control Cost Manual, as stated in our responses above, and so NDEP chooses not to address the comments related to Appendix D. No changes were made to the SIP text as a result of this comment.

NPS follow-up: We suggest that NDEP reconsider its position in view of our discussion of the OAQPS Control Cost manual and the workbook we created base upon that document.

COMMENT 18 (NPS-FWS p.9): There are five Class I areas with 300 kilometers of RG. NVE presented baseline air quality modeling results showing that the facility causes or contributes to visibility impairment at three Class I areas, but only calculated improvement based on impacts at Grand Canyon National Park. Neither NVE nor NDEP

⁵ Our compilations of BART proposals can be found at <http://www.wrapair.org/forums/ssjf/bart.html>

discussed visibility improvement in the context of the benefits to all the impacted Class I areas.

NDEP response: The BART guidelines recommend analyzing visibility improvement for the highest impacted Class I area with the assumption that any improvement in the worse impacted area would result in improvement in the lesser impacted areas. Chapter Five, section 5.6 Visibility Improvement Due to BART Implementation, does present and discuss the visibility improvement for all Class I areas within 300 km of each subject-to-BART facility and concludes with a discussion of the visibility improvement considering all Nevada BART sources in a regional context. In addition, NV Energy presented modeling results for all Class I areas within 300 km of their BART facilities.

NPS follow-up: NDEP is correct in noting that the EPA BART Guidelines allow it to “choose not to analyze the other Class I areas any further as additional analyses might be unwarranted.” However, we believe that it is good public policy to at least consider the consequences of that choice. If the other Class I areas were so distant as to be essentially unaffected, NDEP’s choice could be justified. However, a simple inspection of the modeling results presented by NV Energy shows that, by evaluating impacts only at the closest Class I area, NDEP has ignored from 50% to 90% of the cumulative impacts at the Class I areas for which results are presented. Thus, NDEP has also ignored 50% to 90% of the benefits that would result from any reductions in emissions at these facilities.

NDEP response: NV Energy conducted limited modeling for their determination of BART and, as discussed above, not all BART control scenarios have been modeled for the BART emission limits proposed by NDEP. However, it is commonly held that there is a linear relationship between emissions and modeled visibility impacts. Nevada anticipates greater visibility improvement than that modeled by NV Energy consistent with the data presented in Table 5-8 of Nevada’s SIP, which lists the WRAP baseline emission rates, NV Energy modeled emission rates and the NDEP BART emission rates. No changes were made to the SIP text as a result of this comment.

NPS follow-up: We agree with NDEP that, “In general, there is a linear relationship between CALPUFF modeled visibility and emission rates. The visibility improvement resulting from BART installation is expected to be proportional to the difference in modeled annual emissions and the annual NDEP BART emissions.” However, if one inspects the results in NV Energy’s Table 3-2 for NO_x reductions and Table 5-4 for visibility improvement, it can be seen that, if, for example, a 95 ton per year reduction due to LNBw/OFA at Reid Gardner #3 produces an improvement of 0.407 dv at Grand Canyon, then a reduction of 1,136 tons per year after application of LNBw/OFA+SCR should produce more than the 0.652 dv improvement presented by NV Energy.⁶ If NDEP is to use the NV Energy data, it must insure that the data is valid and that it is properly presented and interpreted. It is apparent that the NVE data that NDEP is using requires further explanation, at the very least.

⁶ Similar inconsistencies can be found throughout the Reid Gardner analyses. For example, the NVE model results indicate that a one ton/yr reduction by LNB will improve visibility 7.5 times as much as a one ton reduction resulting from LNB+SCR.

COMMENT 19 (NPS-FWS p.8): It simply does not make sense to use the same metric to evaluate the effects of reducing emissions from a BART source that impacts only one Class I area as for a BART source that impacts multiple Class I areas. And, it does not make sense to evaluate impacts at one Class I area, while ignoring others that are similarly significantly impaired.

NDEP response: Chapter Five, section 5.2 Dispersion Modeling Results, Table 5-3 and Figures 5-1 through 5-2, presents the visibility improvement resulting from implementation of the BART limits proposed by NV Energy in their BART Analysis reports for Reid Gardner. In addition, Table 5-4 presents the visibility improvement at Grand Canyon National Park, the closest Class I area to the facility, for all proposed BART controls. As NDEP has discussed above, this approach is consistent with the guidelines given in Appendix Y. No changes were made to the SIP as a result of this comment.

NPS follow-up: NDEP is correct in noting that the EPA BART Guidelines allow it to “choose not to analyze the other Class I areas any further as additional analyses might be unwarranted.” However, we believe that it is good public policy to at least consider the consequences of that choice. If the other Class I areas were so distant as to be essentially unaffected, NDEP’s choice could be justified. However, a simple inspection of the modeling results presented by NV Energy shows that, by only evaluating impacts at the closest Class I area, NDEP has ignored from 50% to 90% of the cumulative impacts at the Class I areas for which results are presented. Thus, NDEP has also ignored 50% to 90% of the benefits that would result from any reductions in emissions at these facilities.

COMMENT 20 (NPS-FWS p.9-10): Comments on BART determinations for Ft. Churchill, Mohave and Tracy EGUs. In general, we are pleased that NDEP has chosen BART controls that are more stringent than those proposed by the sources. However, as we evaluated those NDEP determinations, we observed that there were some apparent discrepancies between the levels of control that the sources said were achievable by a given control strategy and the level of control assumed by NDEP in its determination.

We suggest that NDEP include explanations as to how it arrived at its BART limits and why they differed from the emission rates used by the sources in evaluating those control strategies. (There also appear to be some discrepancies among the Tracy Unit #3 emission rates, control efficiencies, and visibility improvements presented by the source and discussed and adopted by NDEP.)

NDEP response: The short answer is that both NDEP and NV Energy applied control efficiencies to calculate emission rates, however the baseline emission rates used were different. NDEP independently arrived at the proposed BART limits based on data reported to the EPA Clean Air Markets Division (acid rain data) and information presented by the sources.

Nevada discusses the analyses of BART controls in section 5.5, Summary of BART Control Analyses of our regional haze SIP. This section includes a discussion of the methodology employed in the determination of baseline emissions and BART emission

limits. A similar explanation is presented in NDEP BART review documents (see NDEP Analysis section under Step 5). Of note is NDEP's determination of baseline emissions scenarios utilizing acid rain data for NO_x and SO₂ and annual emission data reported to NDEP for PM₁₀. The major difference between NDEP's and NV Energy's calculation of BART emission limits is the choice of the baseline emissions. NV Energy's control efficiencies were applied to NDEP's baseline emissions, in lb/mmBtu, to calculate the proposed BART emission rates presented in Chapter Five.

Generally, DOI is concerned that the level of control assumed by NDEP is disparate from the levels of control that the sources stated were achievable by a given control strategy. The requested explanations for the differences are identified by DOI's table. Specifically, DOI asks why the NDEP estimate and the source estimate are not the same.

In Chapter 5 of NDEP's BART report, NDEP explains that a different baseline data set is used based on data reported to the EPA Clean Air Markets Division. This baseline emission strategy is well documented in Chapter 5, page 5-9 of the draft Regional Haze SIP. NDEP used this reported baseline emission data and applied the expected performance of the control technology for NO_x for each BART eligible unit as proposed by the source to establish the BART NO_x emission limit. No changes were made to the SIP text as a result of this comment.

NPS follow-up: It appears that NDEP arrived at its emission rates counter to the approach used by NVE in which NVE estimated the emission rate that was achievable and then calculated the corresponding reduction efficiencies. Instead, NDEP used the "artificially" calculated control efficiencies that resulted from NVE's emission estimates, and then applied those artificial values to its escalated baseline emission and heat input scenarios. As a result, the NDEP emission rates are often higher than the rates presented by NVE. We agree with NVE's approach and it is the approach taken by the overwhelming majority of BART sources across the nation.

COMMENT 21 (NPS-FWS p. 10): As we suggest above, we believe that greater emphasis should be placed upon the degree of visibility improvement that could be achieved in this program designed for that specific purpose. It follows that, if it is cost-effective to spend \$10 million per dv to apply Low-NO_x Burners plus Flue Gas recirculation at Tracy Unit #3, then application of that same criterion to the other proposals would result in determinations that lower emission rates could be achieved. We also suggest that, if NDEP were to consider the cumulative benefits that could be achieved at this \$10 million/dv benchmark, the degree of emission reductions would be still greater.

NDEP response: As Nevada has stated earlier in our response to FLM comments, cost per deciview of visibility improvement is not a required measure of cost effectiveness [Appendix Y Part (V) (1) (4)]. In addition, Nevada is concerned with the rigorous application of this single matrix by the FLM community without guidance from EPA regarding its use. NDEP identified BART through the evaluation of the emission control technology available, the costs of compliance, the energy and non-air environmental impacts of compliance, any pollution control equipment in use at the source, the

remaining useful life of the source and the degree of visibility improvement. Table 1, attached, clearly shows the breaks in cost and visibility factors at the control identified by NDEP as BART (shown by shaded cells in Table 1).

Note that NDEP identified LNB with SNCR as BART for Tracy Unit 3 with a cost effectiveness of \$2,383 per ton, incremental cost of \$1,952 per ton, a cost of \$9.8M per deciview of improvement at the Desolation Wilderness Area, and a capital cost of \$4.4M for a visibility improvement of 0.072 dv at Desolation (the closest Class I area). Unit 3 has the lowest cost effectiveness of the three Tracy units, but the highest capital costs and highest cost per deciview of visibility improvement of any of the control options identified as BART for a NV Energy facility. Table 1, attached, shows BART controls for Reid Gardner have a cost effectiveness of \$1,038 to \$1,588 per ton, incremental costs of \$833 to \$1,560 per ton, costs of \$2.4M to \$2.7M per deciview of improvement at Grand Canyon National Park, and capital costs of \$7.9M for a visibility improvement of 0.514 to 0.63 dv at the Grand Canyon (the closest Class I area). Analysis of these data suggest some of the problems with the \$/dv improvement at a measure of cost effectiveness. No changes were made to the SIP text as a result of this comment.

Regarding the cost per deciview, this is not an approach identified in 40 CFR 51.308 or in 40 CFR 51 Appendix Y. The preferred approach is based on cost per ton of pollutant removed.

NPS follow-up: Instead of showing “problems with the \$/dv improvement as a measure of cost effectiveness” as NDEP contends, the NDEP response simply highlights the problems in its approach to improving visibility by focusing on other parameters unrelated to visibility improvement. As a result, NDEP has created a BART program that would allow the source that causes the most visibility impairment to spend less per unit of visibility improvement than a source that causes far less impairment. We believe that placing more weight on \$/dv provides a clear and objective way to produce BART determinations that recognize the unique situation and impacts of a given source on visibility in the Class I areas that it affects.

NV Energy's Reid Gardner Generating Station Units 1, 2 and 3

NDEP Review (April 15, 2009)

Reid Gardner Generating Station (RGGS) consists of three BART-eligible units with a nominal generating capacity of 110 megawatts (MW) each. The units are wall-fired boilers, which burn primarily bituminous coal. Current controls consist of Low-NO_x Burner (LNB) and Over-Fire Air (OFA) for NO_x, soda ash scrubbers for SO₂, and a mechanical collector for PM₁₀. As part of the planned environmental upgrade pursuant to a 2007 consent decree, the mechanical collector is being removed and new pulse jet fabric filters are being installed for units 1 through 3. With the fabric filter installation, the scrubber Venturi section will be opened further to reduce draft loss through the equipment, and the scrubber operation will be improved to primarily remove SO₂ in the scrubber vessel. RGGS causes visibility impairment in Grand Canyon NP and contributes to impairment in Zion and Joshua Tree National Parks.

STEP 1 – Identify all available retrofit emissions control techniques

NPS: NDEP evaluated a reasonable spectrum of control options.

STEP 2 – Eliminate technically infeasible options

NDEP: No NO_x control options were eliminated. Reductions from other PM₁₀ options are not as great as with the fabric filter installation already planned.

Only scrubber upgrades and new lime / limestone wet scrubber technology options can equal or exceed the SO₂ removal efficiency of the current wet soda ash scrubber. Therefore, only these two alternatives were considered technically feasible. The new wet lime / limestone scrubber option is eliminated because little additional scrubber capital or operating cost is required by improving the current wet soda ash scrubber. No additional scrubber upgrades beyond those identified above were considered, as the upgrades accomplish many of the same purposes.

NPS: While we agree with the basic premise that upgrading the existing scrubbers is the most practical approach and no analysis of other is therefore necessary, that is only true if the BART emission limit represents the 95% reduction capability of the control strategy.¹

STEP 3 – Evaluate control effectiveness of remaining control options

NDEP: NVE's **control efficiencies** presented for each control technology were taken at face-value and used in NDEP's BART determination.

¹ According to NVE, "The projected emission rate for an upgraded wet soda ash FGD system for Reid Gardner 1 is 95 percent SO₂ removal or less than 0.15 lb/mmBtu, while a new wet lime/limestone scrubber installation would have similar removal efficiency. Essentially the same level of SO₂ reduction can be achieved through scrubber upgrades and new wet scrubber installation. Therefore, the new wet lime/limestone scrubber option is eliminated because little additional scrubber capital or operating cost is required by improving the current wet soda ash scrubber."

NPS: This is a misleading statement. NVE estimated the **emission rate** that could be achieved by each control technology option. Instead, NDEP used the “artificially” calculated control efficiencies that resulted from NVE’s emission estimates, and then applied those artificial values to its escalated baseline emission and heat input scenarios.

For example, for the LNB with Selective Catalytic Reduction (SCR) option, NDEP assumed 0.083 – 0.098 lb/mmBtu. However, NVE estimated that it could achieve 0.07 lb/mmBtu. EPA Clean Air Markets (CAM) data (Appendix A) and vendor guarantees² show that SCR can typically meet 0.05 lb/mmBtu on an annual average basis. Neither NVE nor NDEP have provided any documentation or justification to support the higher values used in their analyses.

STEP 4 – Impact analysis

NDEP: NVE’s costs presented for each control technology were taken at face-value and used in NDEP’s BART determination.

NPS: NVE has overestimated the cost of SCR. The BART guidelines advise that:

The basis for equipment cost estimates also should be documented, either with data supplied by an equipment vendor (i.e., budget estimates or bids) or by a referenced source (such as the OAQPS Control Cost Manual, Fifth Edition, February 1996, EPA 453/B-96-001). In order to maintain and improve consistency, cost estimates should be based on the OAQPS Control Cost Manual, where possible.

NVE failed to provide justification or documentation for its cost estimates. As a result, the NDEP estimates for SCR at RGGGS equate to capital costs of \$350/kW for units #1 - #3, compared to the \$50 - \$267/kW typical cost of SCR found in survey data (Appendix B).

STEP 5 – Determine visibility impacts

NDEP: Modeling for pre-control and post-control emission rates demonstrates an improvement in visibility based on the BART conclusions presented by NVE for units 1 through 3 at Reid Gardner. The NO_x emission rate (0.46 lb/mmBtu) modeled is in excess of the proposed NVE BART limit (0.39 lb/mmBtu - annual). Consequently, the modeling results show a lesser improvement in visibility than would be achieved with NVE’s proposed BART limit. Modeling results for other technically feasible control options were not presented.

NDEP anticipates greater visibility improvement upon implementation of BART than shown in NVE’s October 2008 BART report, which is based on a NO_x emission rate of 0.46 lb/mmBtu. The annual NO_x BART emissions are 39% to 67% of the rates modeled by NVE, while the total annual BART emissions are 75% to 86% of the modeled rates, therefore the visibility improvement due to BART should improve somewhat from that modeled.

² Minnesota Power has stated in its Taconite Harbor BART analysis that “The use of an SCR is expected to achieve a NO_x emission rate of 0.05 lb/mmBtu based on recent emission guarantees offered by SCR system suppliers.”

NPS: NDEP should have continued the five-step analysis by evaluating the visibility benefits of at least the more-stringent technically-feasible control options that it rejected. Furthermore, RGGGS' impacts at Grand Canyon represent only 49% of its cumulative impact on the five Class I areas modeled. By focusing on only the Grand Canyon Class I area, NDEP ignored the impacts at the other four Class I areas affected by this facility.

NDEP Analysis

NDEP: NDEP used the average of the two consecutive years of the highest annual emissions using acid rain data from calendar years 2001 through 2007 to establish the baseline emissions for NO_x. The control efficiencies provided by NVE were then applied to the baseline NO_x emission rates to calculate the BART emission limits. NDEP specifically reviewed the cost per ton (\$/ton) of NO_x removed for each unit at RGGGS and determined that installation of ROFA with Rotamix for units 1 through 3 meets the BART criteria, with associated first year costs of \$1,038 to \$1,588/ton of NO_x removed, depending on the unit evaluated. NDEP also concluded based on a review of the economic analysis that the \$/ton of NO_x removed increased significantly for the LNB with OFA and SNCR, and ROFA with SCR technologies without correspondingly significant improvements in visibility. NDEP concludes that, for NO_x, the installation of ROFA with Rotamix with an emission level at 0.20 lb/mmBtu for unit 1 and unit 2, and 0.28 lb/mmBtu for unit 3, on a 12-month rolling average, is BART.

NPS: We believe that a proper consideration of the cost-effectiveness of reducing NO_x to improve visibility (e.g., \$/dv) would lead to the conclusion that LNB+SCR with an emission level at 0.05 lb/mmBtu (annual average) is BART.³ Even if we use NDEP's cost estimates and modeling results, the cumulative benefits of improving visibility in the five Class I areas impacted by RGGGS are less than \$4 million/dv for each unit, which is well below the \$10 - \$17 million /dv means for BART proposals nationwide,⁴ and even below the \$9.8 million/dv that NDEP determined was reasonable to reduce NO_x at TGS #3.

We used EPA's OAQPS Control Cost Manual (as recommended by the BART Guidelines) to estimate cost-effectiveness values of \$1,570/ton for RGGGS #1, \$1,346/ton for RGGGS #2, and \$1,660/ton for RGGGS #3 which are significantly less than the \$3,050/ton that NDEP determined was reasonable at TGS #1 for LNB+FGR. (Our analyses are contained in Appendix C.)

We used NVE's modeling results to derive estimates of visibility improvement that would result from our greater annual emissions reductions and translated that to cost-effectiveness values of \$1.8 - \$2.5 million/dv at Grand Canyon and \$0.9 - \$1.2 million/dv across the five Class I areas modeled.⁵ The benefits of improving visibility in Grand Canyon NP and the other four Class I areas impacted by RGGGS are well below the \$10 -

³ Because visibility is a short-term Air Quality Related Value, we recommend that states set corresponding short-term limits. For example, our data suggest that an annual average emission rate of 0.05 lb/mmBtu equates to a 30-day rolling average of 0.06 lb/mmBtu and a 24-hour block average rate of 0.07 lb/mmBtu.

⁴ Our compilations of BART proposals can be found at <http://www.wrapair.org/forums/ssjf/bart.html>

⁵ RGGGS #1 @ \$2.5 million/dv at Grand Canyon and \$1.2 million/dv across the five Class I areas modeled. RGGGS #2 \$2.1 million/dv at Grand Canyon and \$1.0 million/dv across the five Class I areas modeled. RGGGS #3 \$1.8 million/dv at Grand Canyon and \$0.9 million/dv across the five Class I areas modeled.

\$17 million /dv means for BART proposals nationwide,⁶ and even below the \$9.8 million/dv that NDEP determined was reasonable to reduce NO_x at TGS #3.

NDEP: NDEP used the 98th percentile emissions values from acid rain data from 2001 through 2007 to establish the baseline SO₂ emissions for Reid Gardner's units.⁷ Wet soda ash FGD was identified by NVE, and concurred with by the state, as the SO₂ BART control technology at RGGS and is the current control technology in use at the facility. NDEP proposed SO₂ BART emission limits in consideration of the long operational history of the control units, uncertainties in future coal supply for this facility and changes in boiler operation from the current pressurized operation to balanced draft operation, as well as the Clean Air Act factors of expected emission rates, emissions performance levels, expected emissions reductions, costs of compliance, energy impacts, non-air quality environmental impacts and modeled visibility impacts. NDEP has also concluded that the BART emission limit for SO₂ is 0.25 lb/mmBtu. These BART emission limits allow for future operation within 98% of historical emissions and provide some flexibility during transition to a different post-BART operating scenario including operation under a balanced draft versus forced-draft scenario and a potential change in coal type.

NPS: It is not clear how NDEP arrived at emission limits⁸ that are more than six times higher than the 2007 annual average SO₂ emission rates (0.035 – 0.039 lb/mmBtu) for these units. According to NVE:

It is projected that the operation of the present wet soda ash FGD system may be improved as a result of the fabric filter installation. However, even with incremental improvements, minimal additional improvement to the current low SO₂ emission level can be consistently expected from upgrades to the existing wet soda ash scrubber. Only scrubber upgrades and new lime/limestone wet scrubber technology options can equal or exceed the removal efficiency of the current wet soda ash scrubber. Therefore, only these two alternatives are considered technically feasible for purposes of this analysis... When evaluating the control effectiveness of SO₂ reduction technologies, each option can be compared against benchmarks of performance. The projected emission rate for an upgraded wet soda ash FGD system for Reid Gardner 1 [as well as 2 and 3] is 95 percent SO₂ removal or less than 0.15 lb/MMBtu, while a new wet lime/limestone scrubber installation would have similar removal efficiency.

NDEP should provide more information concerning its statistical analysis and explain in detail the factors⁹ it used to arrive at its proposed BART limit.

⁶ Our compilations of BART proposals can be found at <http://www.wrapair.org/forums/ssjf/bart.html>

⁷ However, the SO₂ acid rain data for Reid Gardner contained periods of invalid data due to O₂ monitor problems identified by NDEP during a compliance investigation. Therefore, NDEP omitted the invalid data from the calculation of baseline SO₂ emissions. The omission of the invalid data effectively lowered the baseline emissions, in lb/mmBtu, by nearly half.

⁸ Because BART is an emission limit, simply specifying the control technology with the expectation that it will perform to the fullest of its capabilities is not adequate.

⁹ uncertainties in future coal supply for this facility and changes in boiler operation from the current pressurized operation to balanced draft operation, as well as the Clean Air Act factors of expected emission rates, emissions performance levels, expected emissions reductions, costs of compliance, energy impacts, non-air quality environmental impacts and modeled visibility impacts

NDEP: NDEP has also concluded that the BART emission limit for PM₁₀ is 0.015 lb/mmBtu for all three units.

NPS: NDEP should explain why the new fabric filters at RGGGS cannot achieve the same 0.010 lb/mmBtu rate it proposed in the Toquop and Ely draft permits.

NV Energy (NVE) Fort Churchill Generating Station Units 1 and 2

NDEP Review (January 5, 2009)

Fort Churchill Generating Station (FCGS) consists of two BART-eligible units with a generating capacity of 113 megawatts each. The fuel currently used in units 1 and 2 is pipeline quality natural gas (PNG) or blended fuel oil (No. 6 residual oil and No. 2 distillate fuel oil). FCGS causes visibility impairment in Mokelumne Wilderness Area (WA), Desolation WA, Emigrant WA, Caribou WA, Lassen Volcanic National Park (NP), and South Warner WA, and contributes to impairment in Hoover WA, Yosemite NP, Ansel Adams WA, John Muir WA, Kings Canyon NP, Thousand Lakes WA, and Sequoia NP

STEP 1 – Identify all available retrofit emissions control techniques

NPS: Except for exclusion of Over-Fire Air (OFA) as noted below, NDEP evaluated a reasonable spectrum of options.

STEP 2 – Eliminate technically infeasible options

NDEP: Technical feasibility for the proposed control options were based on physical constraints, boiler configuration and emission reduction potential. However, the installation of OFA was the only control option eliminated due to the potential cost of boiler wall changes.

NPS: The OFA option cannot be eliminated without an analysis of costs in Step 3.

STEP 3 – Evaluate control effectiveness of remaining control options

NDEP: NVE's **control efficiencies** presented for each control technology were taken at face-value and used in NDEP's BART determination.

NPS: This is a misleading statement. NVE estimated the **emission rate** that could be achieved by each control technology option. Instead, NDEP used the "artificially" calculated control efficiencies that resulted from NVE's emission estimates, and then applied those artificial values to its escalated baseline emission and heat input scenarios.

For the Low-NO_x Burner (LNB) with Flue Gas Recirculation (FGR) option selected by NDEP (below), NVE assumed that it could achieve a lower emission rate (0.12 lb/mmBtu) when burning natural gas than NDEP is proposing (0.20 and 0.16 lb/mmBtu for FCGS #1 & #2, respectively). NDEP should base its determinations on the emission rates presented by NVE.

STEP 4 – Impact analysis

NDEP: NVE's cost presented for each control technology were taken at face-value and used in NDEP's BART determination.

NPS: Not only should NDEP have more closely scrutinized NVE's cost data, it did not take the NVE costs "at face value" as stated. Instead, for example, NDEP estimated the

cost of LNB with Selective Catalytic Reduction (SCR) at \$35,781,250, which is significantly higher than the \$28,625,000 presented by NVE. Not only did NVE fail to justify its costs, but NDEP's escalation of those costs¹ appears to be without justification or explanation. As a result, the NDEP estimate for SCR at FCGS equates to a capital cost of \$317/kW compared to the \$50 - \$267/kW typical cost of SCR found in survey data (see Appendix B).

STEP 5 – Determine visibility impacts

NDEP: Modeling for pre-control and post-control emission rates demonstrates an improvement in visibility based on the BART conclusions presented by NVE for units 1 and 2 at FC. The NO_x emission rate (0.40 lb/mmBtu) modeled is in excess of the proposed NVE BART limit (0.28 lb/mmBtu - annual). Consequently, the modeling results show a lesser improvement in visibility than would be achieved with NVE's proposed BART limit. Modeling results for other technically feasible control options were not presented.

NPS: NDEP should have continued the five-step analysis by evaluating the visibility benefits of at least the more-stringent technically-feasible control options that it rejected. Furthermore, FCGS' impacts at Mokelumne WA represent only 13% of its cumulative impact on the 14 Class I areas modeled. By focusing on only the Mokelumne Wilderness Class I area, NDEP ignored the impacts at the other 13 Class I areas affected by this facility.

BART Proposal

NDEP: For both units, BART for SO₂ is use of PNG and/or low-sulfur No. 2 fuel oil with an emission limit of 0.05 lb/mmBtu, 24-hr average. For PM₁₀, BART is also PNG and/or low-sulfur No. 2 fuel oil but with an emission limit of 0.03 lb/mmBtu, 3-hr average.

Based on this review, NDEP concludes that for NO_x the installation of LNB with FGR with an emission level at 0.20 lb/mmBtu for unit 1 and 0.16 lb/mmBtu for unit 2, on a 12-month rolling average, is BART.

NPS: NDEP should better explain how it arrived at these conclusions. We believe that a proper consideration of the cost-effectiveness of reducing NO_x to improve visibility (e.g., \$/dv) would lead to the conclusion that LNB+SCR is BART. Even if we use NDEP's cost estimates and modeling results, the cumulative benefits of improving visibility in the 14 Class I areas impacted by FCGS are less than \$3 million/dv for each unit, which is well below the \$10 - \$17 million /dv means for BART proposals nationwide,² and even below the \$9.8 million/dv that NDEP determined was reasonable to reduce NO_x at TGS #3.

¹ With one exception, NDEP escalated the costs of all control options beyond the NVE estimates.

² Our compilations of BART proposals can be found at <http://www.wrapair.org/forums/ssjfbart.html>

NV Energy (NVE) Fort Churchill Generating Station Units 1 and 2

NDEP Review (January 5, 2009)

Fort Churchill Generating Station (FCGS) consists of two BART-eligible units with a generating capacities of 113 megawatts each. The fuel currently used in units 1 and 2 is pipeline quality natural gas (PNG) or blended fuel oil (No. 6 residual oil and No. 2 distillate fuel oil). FCGS causes visibility impairment in Mokelumne Wilderness Area (WA), Desolation WA, Emigrant WA, Caribou WA, Lassen Volcanic National Park (NP), and South Warner WA, and contributes to impairment in Hoover WA, Yosemite NP, Ansel Adams WA, John Muir WA, Kings Canyon NP, Thousand Lakes WA, and Sequoia NP

STEP 1 – Identify all available retrofit emissions control techniques

NPS: Except for exclusion of Over-Fire Air (OFA) as noted below, NDEP evaluated a reasonable spectrum of options.

STEP 2 – Eliminate technically infeasible options

NDEP: Technical feasibility for the proposed control options were based on physical constraints, boiler configuration and emission reduction potential. However, the installation of OFA was the only control option eliminated due to the potential cost of boiler wall changes.

NPS: The OFA option cannot be eliminated without an analysis of costs in Step 3.

STEP 3 – Evaluate control effectiveness of remaining control options

NDEP: NVE's **control efficiencies** presented for each control technology were taken at face-value and used in NDEP's BART determination.

NPS: This is a misleading statement. NVE estimated the **emission rate** that could be achieved by each control technology option. Instead, NDEP used the "artificially" calculated control efficiencies that resulted from NVE's emission estimates, and then applied those artificial values to its escalated baseline emission and heat input scenarios.

For the Low-NO_x Burner (LNB) with Flue Gas Recirculation (FGR) option selected by NDEP (below), NVE assumed that it could achieve a lower emission rate (0.12 lb/mmBtu) when burning natural gas than NDEP is proposing (0.20 and 0.16 lb/mmBtu for FCGS #1 & #2, respectively). NDEP should base its determinations on the emission rates presented by NVE.

STEP 4 – Impact analysis

NDEP: NVE's cost presented for each control technology were taken at face-value and used in NDEP's BART determination.

NPS: Not only should NDEP have more closely scrutinized NVE's cost data, it did not take the NVE costs "at face value" as stated. Instead, for example, NDEP estimated the

NPS: Not only should NDEP have more-closely scrutinized NVE's cost data, it did not take the NVE costs "at face value" as stated. Instead, for example, NDEP estimated the cost of LNB with Selective Catalytic Reduction (SCR) for TGS #1 at \$21,175,000, which is significantly higher than the \$16,940,000 presented by NVE. Not only did NVE fail to justify its costs, but NDEP's escalation of those costs¹ appears to be without justification or explanation. As a result, the NDEP estimates for SCR at TGS equate to capital costs of \$385/kW, \$383/kW and \$317/kW for units #1 - #3, respectively, compared to the \$50 - \$267/kW typical cost of SCR found in survey data (see Appendix B).

STEP 5 – Determine visibility impacts

NDEP: NDEP anticipates greater visibility improvement upon implementation of BART than shown in NVE's October 2008 BART report, which is based on a NO_x emission rate of 0.40 lb/mmBtu. The annual NO_x BART emissions are 27% to 48% of the rates modeled by NVE, while the total annual BART emissions are 39% to 57% of the modeled rates, therefore the visibility improvement due to BART may be as much as twice that modeled.

NPS: NDEP should have continued the five-step analysis by evaluating the visibility benefits of at least the more-stringent technically-feasible control options that it rejected. Furthermore, TGS' impacts at Desolation WA represent only 10% of its cumulative impacts on the 15 Class I areas modeled. By focusing on only the Desolation Wilderness Class I area, NDEP ignored the impacts at the other 14 Class I areas affected by this facility.

BART Proposal

NDEP: NDEP concurs with each BART determination for units 1, 2 and 3 at Tracy, with the exception of the installation of only LNB for control of NO_x emissions at units 2 and 3, and the proposed NO_x emission limits at all three units. For all TGS units, BART for SO₂ is use of PNG and/or low-sulfur No. 2 fuel oil with an emission limit of 0.05 lb/mmBtu, based on a 24-hr averaging period. For PM₁₀, BART is also PNG and/or low-sulfur No. 2 fuel oil, but with an emission limit of 0.03 lb/mmBtu, 3-hr average.

NDEP concludes that the installation of LNB with FGR with an emission limit of 0.15 lb/mmBtu for unit 1 and 0.12 lb/mmBtu for unit 2, as well as LNB with SNCR with an emission limit of 0.19lb/mmBtu for unit 3, on a 12-month rolling average, is BART.

NPS: NDEP should better explain how it arrived at these conclusions. We believe that a proper consideration of the cost-effectiveness of reducing NO_x to improve visibility (e.g., \$/dv) would lead to the conclusion that LNB+SCR is BART. Even if we use NDEP's cost estimates and modeling results, the cumulative benefits of improving visibility in the 15 Class I areas impacted by TGS are such that the cost of improving visibility is less than \$4 million/dv for each unit, which is well below the \$10 - \$17 million /dv means for BART proposals nationwide,² and even below the \$9.8 million/dv that NDEP determined was reasonable to reduce NO_x at TGS #3.

¹ NDEP escalated the costs of all control options beyond the NVE estimates.

² Our compilations of BART proposals can be found at <http://www.wrapair.org/forums/ssjf/bart.html>

SECTION D.2.2.3.2

NEVADA'S RESPONSE

(to U.S. Department of Interior, National Park Service Comment Letter)

2.2.3.2 Nevada's Response

Introduction

The focus of the NPS follow-up comments is the Reid Gardner Generating Station, particularly as related to the BART emission limit for SO₂ and the determination of the BART control technology for NO_x. NDEP notes that the NPS concurs with the BART technology NDEP has identified for the three units at the Tracy Generating Station and the two units at the Fort Churchill Generating Station as expressed in their follow-up comment to Comment 7 (see Appendix C).

USEPA's BART guidance states:

"The visibility regulations define BART as follows:

Best Available Retrofit Technology (BART) means an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction for each pollutant which is emitted by . . . [a BART-eligible source]. The emission limitation must be established, on a case-by-case basis, taking into consideration the technology available, the costs of compliance, the energy and non-air quality environmental impact of compliance, any pollution control equipment in use or in existence 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."²

The preamble to the BART guidance indicates that states are free to determine the weight and significance to be assigned to each statutory factor³ and also suggests the BART determination process allows states to identify a technology which does not pose unacceptable costs of compliance, energy and/or nonair quality environmental impacts⁴. In addition, the guidance provides that the states use average and incremental costs to determine the reasonableness of compliance costs⁵.

NDEP identified the BART technologies and emissions limits on a case-by-case basis through an analysis of the five statutory factors consistent with EPA guidance. NDEP evaluated the costs of compliance based on the average cost, incremental cost and capital cost. We evaluated the degree of visibility improvement using NV Energy's modeling data, which we supplemented with the expected emissions reductions since modeled visibility impacts are proportional to emission rates. NDEP consistently evaluated the cost and visibility data by looking at clear breaks in the cost effectiveness of the BART controls and resulting visibility improvement or emissions reductions. Examination of Table 1, Appendix C, of this SIP reveals these breaks in cost benefit, as do the least cost envelopes presented as Figure 1 in each of the NDEP BART determination review reports in Appendix B.

² 40 CFR Part 51 Appendix Y (IV) (A)

³ 70 FR page 39130

⁴ 70 FR page 39130

⁵ 40 CFR Part 51 Appendix Y (IV) (D) (4) (b)

BART is only one of the tools available for states to utilize in a long-term strategy to meet their 2018 reasonable progress goal. Nevada's 2018 reasonable progress goal is better than the uniform rate of progress when evaluated with NDEP's proposed BART emission limits. NDEP deems our determination of BART control technologies and emission limits as consistent with USEPA guidance and the RHR.

NPS Follow-Up Comments

The NPS follow-up comments are reproduced below in italics with NDEP's follow-up response in plain text. Comment numbers refer to the original FLM comments received during the FLM review with the commenter and page number enclosed in parenthesis. Only FLM comments with NPS follow-up comments are listed below. See Appendix C for the complete set of FLM comments on the FLM consultation draft of the SIP.

COMMENT 6 (FS) NPS follow-up:

The BART program is designed to set emission limits to protect and improve visibility, which is a transitory, short-term attribute. NDEP should facilitate the goals of the BART program by regulating short-term emissions of NO_x, a pollutant that significantly impairs visibility in the area.

NDEP follow-up response:

Nevada has identified NO_x emission limits based on 12-month rolling averages. We have chosen this time period based on our industry's operational experience with retrofits. NV Energy has installed rotating opposed fire air on one of its units at Reid-Gardner (unit 4) and confronted serious operational problems, creating a high degree of variability in the operational characteristics of the unit. In order to ensure that industry is not out of compliance because of such issues, Nevada has chosen the 12-month rolling average. It should be noted that because it is a rolling average, the average is calculated each month and not simply at the end of a full calendar year.

NDEP deems our BART emission limits do facilitate the goals of the BART program. Examination of IMPROVE monitor data representing Class I areas in the states adjacent to Nevada reveals that NO_x contributes to visibility impairment, but at levels considerably less than other pollutants (see NDEP's response to NGO Comment 4 in section 2.2.4 below). Those Class I areas where NO_x significantly impairs visibility are clearly influenced by mobile sources (i.e., Zion and Craters of the Moon).

No changes were made to Nevada's draft RH SIP as a result of this comment.

COMMENT 7 (NPS-FWS p.5) NPS follow-up:

*It appears that NDEP has based its BART determinations upon three factors, **capital cost, cost per ton, and incremental cost per ton**. NDEP cites the \$8 million capital cost of ROFA+Rotamix at Reid Gardner Generating Station (RGGS) as one example of a parameter it considered. This is the highest capital cost of any NO_x control strategy accepted by NDEP. Use of this cap on capital cost improperly excludes controls that may be more effective on other bases (e.g., \$/ton,*

\$/dv) but higher because they would be applied to larger sources. We therefore recommend against use of capital cost.

We agree that cost per ton and incremental cost per ton are appropriate factors, and note that NDEP determined that an average of \$3,050/ton was an acceptable cost for Low-NO_x Burners (LNB) and Flue Gas Recirculation (FGR) at Tracy Generating Station (TGS) Unit #1, and that \$4,972 per ton was an acceptable incremental cost for LNB+FGR at TGS Unit #2. However, we continue to advise against over-reliance upon incremental cost. First, it is generally understood that the cost/ton of pollution control is an exponential function with an increasing slope as higher control efficiencies are approached. Thus, the incremental cost of moving from lower control to higher control will increase as higher control efficiencies are sought. One way to deal with this problem is to look not at the absolute values of the incremental cost, but to the relative ratios of the incremental costs.

The incremental cost evaluation problem is apparent at Fort Churchill Generating Station (FCGS) where the incremental cost ratio of the LNB+FGR strategy chosen by NDEP is 2.7 times the next-lowest-\$/ton strategy (LNB). However, NDEP rejected the LNB+SCR strategy, even though its relative incremental cost ratio was only 2.0.

At RGGGS, NDEP rejected any strategy with a relative incremental cost ratio greater than 1.1.

Although NDEP did not explain how it considered the importance of actually relating costs to visibility improvement for this visibility improvement program, we also note that NDEP found that a cost of \$9.8 million/dv was acceptable for addition of LNB plus Selective Non-Catalytic Reduction (SNCR) at Tracy #3.

Applying this \$9.8 million/dv “benchmark” to the Nevada BART sources and using the NDEP data in its Table #1 produces the following conclusions for BART:

- *At Tracy #1, BART is LNB+FGR as proposed by NDEP.*
- *At Tracy #2, BART is LNB+FGR as proposed by NDEP.*
- *At Tracy #3, BART is LNB+SNCR as proposed by NDEP.*
- *At Ft. Churchill #1, BART is LNB+FGR as proposed by NDEP.*
- *At Ft. Churchill #2, BART is LNB+FGR as proposed by NDEP.*
- *At Reid Gardner #1, BART is LNB +SCR.*
- *At Reid Gardner #2, BART is LNB +SCR.*
- *At Reid Gardner #3, BART is LNB +SCR.*

If we use NDEP’s determinations that an average of \$3,050/ton was an acceptable cost for LNB+FGR at TGS Unit #1, and that a cost of \$9.8 million/dv was acceptable for addition of LNB+SNCR at TGS #3 as our criteria, we arrive at the same results.

On average cost/ton and cost/dv bases, LNB+SCR is clearly BART at all three RGGGS units. Despite NDEP’s assertion that it did not rely solely upon incremental costs, it appears that the only way NDEP can justify rejecting LNB+SCR at RGGGS is on that basis. NDEP should clearly state the basis for its BART determinations, and how it included effects on visibility.

NDEP follow-up response:

USEPA's BART guidance⁶ lists five factors states must consider in identifying BART, but does not identify any individual factor for greater consideration as the FLMs have with the fifth factor, the degree of visibility improvement which may reasonably be anticipated from the use of BART. The BART guidance⁷ provides direction on selecting the "best" alternative including identification of the average and incremental cost, consideration of the modeled visibility impacts, justification for adopting the technology selected as the "best" level of control, and an explanation of the CAA factors leading to the BART option selected. The guidance⁸ recommends two types of cost-effectiveness calculations – average cost effectiveness and incremental cost effectiveness.

NDEP has followed the guidance provided in Appendix Y in our identification of BART controls for Nevada sources, in spite of the contentions to the contrary by the FLM community. However, NDEP did not apply a cap on capital cost, cost per ton, or incremental cost as implied by NPS, but evaluated the cost effectiveness and capital cost for each facility independently (i.e., on a case-by-case basis in accordance with Appendix Y guidance). Acceptable costs for BART controls at one source did not determine acceptable BART control costs at other sources (i.e., Nevada has not established "benchmarks" that define acceptable BART cost metrics. Acceptable costs were determined on a source-by-source basis.). Although NPS recommends against using capital cost in the BART determination process, note that capital cost, coupled with control efficiency determine the control cost (i.e., cost per ton).

As NDEP has stated in previous responses to FLM comments (see Appendix C, NPS-NWS Comment 17 and NDEP Response), Nevada does not agree with the optional cost effectiveness measure of dollars per deciview (\$/dv) of visibility improvement. Nevada notes that \$/dv is an optional measure of cost effectiveness as listed in the BART guidance⁹ and that EPA provides no guidance on the use of this metric in the selection of BART controls.

Nevada has evaluated the inherent uncertainty in use of \$/dv as a cost effectiveness metric using Oregon DEQ's cost evaluation for the Boardman facility. The annual cost of installing and operating NLNB/MOFA with SDFGD as BART controls for the Boardman facility is approximately \$40M. NDEP has used these costs and DEQ's modeled post-BART visibility improvement at all 14 Class I areas within 300 km of the facility to calculate the cost effectiveness in millions of \$/dv. The results were used to evaluate how the number and distribution of Class I areas affect \$/dv as a cost effectiveness metric.

NDEP calculated the cost effectiveness in \$/dv for five different groupings of Class I areas, as follows:

- All Class I areas within 300 km of the Boardman facility (Mt. Adams, Goat Rocks, Mt. Hood, Eagle Cap, Strawberry Mountain, Mt. Rainier, Mt. Jefferson, Alpine Lakes, Three Sisters, Mt. Washington, Hells Canyon, Glacier Peak, Diamond Peak, North Cascades),

⁶ 40 CFR Part 51 Appendix Y (I) (C) (2)

⁷ 40 CFR Part 51 Appendix Y (IV) (E) (2)

⁸ 40 CFR Part 51 Appendix Y (IV) (D) (4) (b)

⁹ 40 CFR Part 51 Appendix Y (IV) (E) (1) (4)

- The 5 Class I areas closest to the facility (Mt. Adams, Goat Rocks, Mt. Hood, Eagle Cap, Strawberry Mountain),
- The 5 Class I areas in the middle distance (Mt Rainer, Mt. Jefferson, Alpine Lakes, Three Sisters, Mt. Washington),
- The 2 closest and 3 most distant Class I areas (Mt. Adams, Goat Rocks, Glacier Peak, Diamond Peak, North Cascades), and
- The 5 most distant Class I areas (Mt. Washington, Hells Canyon, Glacier Peak, Diamond Peak, North Cascades).

The results are presented in Table 1.

TABLE 1. EVALUATION OF \$/DV AS COST EFFECTIVENESS METRIC

	Baseline Visibility (dv)	Phase I Visibility (dv)	Phase I Improvement (dv)	Cost Effectiveness (millions \$/dv)
All CIAs within 300 km				
Mt. Adams, Goat Rocks, Mt. Hood, Eagle Cap, Strawberry Mountain, Mt. Rainer, Mt. Jefferson, Alpine Lakes, Three Sisters, Mt. Washington, Hells Canyon, Glacier Peak, Diamond Peak, North Cascades	31.09	13.84	17.25	2.32
Closest 5 CIAs				
Mt. Adams, Goat Rocks, Mt. Hood, Eagle Cap, Strawberry Mountain	13.65	6.41	7.24	5.52
5 CIAs in Middle Distance				
Mt. Rainer, Mt. Jefferson, Alpine Lakes, Three Sisters, Mt. Washington	12.00	5.26	6.74	5.93
2 Closest and 3 Most Distant CIAs				
Mt. Adams, Goat Rocks, Glacier Peak, Diamond Peak, North Cascades	8.59	3.66	4.93	8.11
Most Distant 5 CIAs				
Mt. Washington, Hells Canyon, Glacier Peak, Diamond Peak, North Cascades	7.77	3.18	4.59	8.71

Table 1 shows a considerable range of costs depending on the number and location of the impacted Class I areas. These costs range from \$2.32 million to \$8.71 million/dv of visibility improvement depending on the number and location of the affected Class I areas. Table 1 shows that the more distant the Class I areas the higher the cost of BART controls in \$/dv, while the closer the Class I areas the lower the cost in \$/dv. Note that the traditional measures of cost effectiveness; total annualized costs in dollars; cost effectiveness in dollars per ton; and incremental cost effectiveness in dollars per ton, remain constant. Only the number and location of the Class I areas were changed for this evaluation. The results clearly demonstrate how the location and number of Class I areas can influence the use of \$/dv as a cost effectiveness metric.

NDEP has utilized capital costs, cost per ton of pollutant removed, and incremental cost differences in our cost evaluation of BART controls. NDEP does not accept the use of \$/dv as an effective measure of cost effectiveness for the reasons stated above.

As Nevada stated in our response to the initial FLM comment (Appendix C, Comment 17), NDEP evaluated the control cost, incremental cost, and capital cost in combination and used a “least-cost envelope” to identify dominant alternatives on a facility by facility basis. NDEP then evaluated these factors with the estimated emissions reductions to determine BART for each source individually, as each source has unique characteristics of cost and control efficiency. Nevada used the limited visibility modeling performed by NV Energy in conjunction with the emissions reductions to estimate the visibility improvement based on the premise of a linear relationship between modeled visibility and emission rates (NPS agrees with this premise in a subsequent comment).

The NPS has ignored the remainder of NDEP’s response, which identifies how capital cost, cost per ton and incremental cost increase, as well as the limited emissions reductions achieved for the next most stringent control option at Reid Gardner. Capital cost increases by more than four times, cost per ton by more than twice, and incremental cost by more than seven times, while emissions are reduced by 542 tpy or 41 percent for unit 1. The clear breaks in these factors support NDEP’s BART determination. NDEP’s other BART determinations have similar characteristics when considered on a source-by-source basis.

NPS goes on to advise against over reliance upon incremental cost, stating that “the incremental cost of moving from lower control to higher control will increase as higher control efficiencies are sought.” Examination of Table 1, “BART NO_x Cost Factors and Visibility Improvement for NV Energy Facilities,” included in Appendix C of this SIP, demonstrates that several more stringent control options have incremental costs lower than the next less stringent control option (e.g., for Tracy unit 1 see LNB w/ SNCR, LNB w/ FGR, and LNB w/ SCR; for Tracy unit 2 see LNB w/ SNCR; for Tracy unit 3 see LNB w/ SNCR and LNB w/ SCR; for Fort Churchill units 1 and 2 see LNB w/ SCR; for Reid Gardner units 1 and 2 see ROFA w/ Rotamix; and for Reid Gardner unit 3 see LNB w/ OFA and SNCR). Therefore, the NPS premise for not using incremental cost is flawed.

NPS further proposes use of relative ratios of incremental costs and then points out the problem with this approach. However, examination of the problematic data cited by NPS suggests they have misinterpreted the data. NPS has apparently presented ratios of average cost effectiveness (in \$/ton) rather than ratios of incremental cost effectiveness for the options they evaluated, based on the data presented in Table 1 of NDEP’s response to FLM comments. Appendix Y does not mention the use of relative ratios of incremental costs as a measure of cost effectiveness.

Nevada is pleased that NPS has reached the same conclusions regarding BART control technologies as NDEP for the Tracy Generating Station and Fort Churchill Generating Station. However, Nevada is confused regarding NPS’ conclusions for BART at Reid Gardner Generating Station, as LNB with SCR was not one of the BART control options considered or

presented by NV Energy or NDEP. If NPS means LNB with OFA and SCR is BART for Reid Gardner, then NDEP disagrees with the NPS assessment.

Based on the data in Table 1, referenced above, installation of ROFA with Rotamix at the Reid Gardner Generating Station has an estimated capital cost of nearly \$8 million per unit, while LNB with OFA and SCR has capital costs of more than \$35 million per unit, 4.4 times as much. Average cost effectiveness for the SCR option is 2.3 times as much for units 1 and 2, and 1.7 times as much for unit 3. Incremental costs for the SCR option are 7.3 times as much for unit 1, 6.8 times for unit 2, and 2.4 times as much for unit 3. Emissions reductions increase between the two options by 41 percent for unit 1, 39 percent for unit 2, and 104 percent for unit 3. Selection of the SCR option would increase the facility's capital costs by more than \$81 million to reduce NO_x emissions by approximately 2,000 tons per year. Nevada deems NDEP's identification of BART as consistent with the breaks in cost effectiveness and visibility improvement/emissions reductions (i.e., cost benefits), as well as the Appendix Y guidance.

To determine whether changes resulting from these comments regarding cost and control efficiencies might significantly change NDEP's conclusions, Nevada evaluated alternative cost and emission scenarios in cost analyses. This is not to say Nevada agrees with the values used in the alternative scenarios cost analyses, but we did want to evaluate how reduced costs might influence NDEP's BART determination for Reid Gardner. This exercise will be referred to as the alternative cost analyses in the remainder of this document.

Alternative Cost Analyses

NDEP included an economic analysis summary as Table 1 in each of NDEP's BART determination reviews for our subject-to-BART sources. These reviews are included in Nevada's RH SIP as Appendix B, *BART Determination Support Documents*¹⁰. Table 1 in NDEP's economic analysis for Reid Gardner¹¹, is the basis of the alternative cost analyses. For this exercise, Table 1 was modified to incorporate the lower emission limits (in lb/MMBtu) presented by NV Energy for the various proposed NO_x BART controls regardless of percent control efficiency (an approach preferred by NPS as noted in their follow-up comment 15) and is presented below as Table 2. Changing these NO_x emission limits addresses some of the FLM comments directed at the control efficiencies used by NDEP in our original economic analyses.

In addition, NDEP evaluated lower control costs by reducing NV Energy's costs by 30 percent to address FLM comments suggesting NV Energy's costs were inflated. So, the alternative cost analyses for Reid Gardner, presented in Table 2 below, incorporate higher percentage control efficiencies with lower emission rates and lower costs. Figure 1 presents the least cost envelope analyses for Reid Gardner units 1, 2 and 3 based on NDEP's alternative cost analyses. Note that these analyses are based on baseline values determined by NDEP and that these values are not the same baseline values used by NV Energy.

Examination of Table 2 and Figure 1, below, shows the results of NDEP's alternative cost analyses do not change our determination of BART for the three Reid Gardner units, even with

¹⁰ Available at <http://ndep.nv.gov/baqp/planmodeling/rhaze.html>.

¹¹ Nevada Division of Environmental Protection BART Determination Review of NV Energy's Reid Gardner Generating Station Units 1, 2 and 3

the greater emissions reductions and lower costs suggested by the FLMs. LNB with OFA and SCR costs per ton of NO_x removed for all three units are 2.25 to 2.5 times greater than those for ROFA with Rotamix. The LNB with OFA and SCR incremental costs per ton for units 1 and 2 are 7.5 to 8 times greater than those for ROFA with Rotamix, while the LNB with OFA and SCR incremental costs for unit 3 are 2.5 times those for ROFA with Rotamix. The annual reduction in NO_x emissions for LNB with OFA and SCR from units 1 and 2 is 56 percent (441 tpy for unit 1 and 472 tpy for unit 2), while the reduction for unit 3 is 65 percent (654 tpy) of the emissions for ROFA with Rotamix. These factors, based on NDEP's alternative cost analyses, coupled with a capital cost increase of more than 400 percent for SCR controls, confirm NDEP's selection of ROFA with Rotamix as SO₂ BART for Reid Gardner.

TABLE 2. REID GARDNER ALTERNATIVE COST ANALYSES

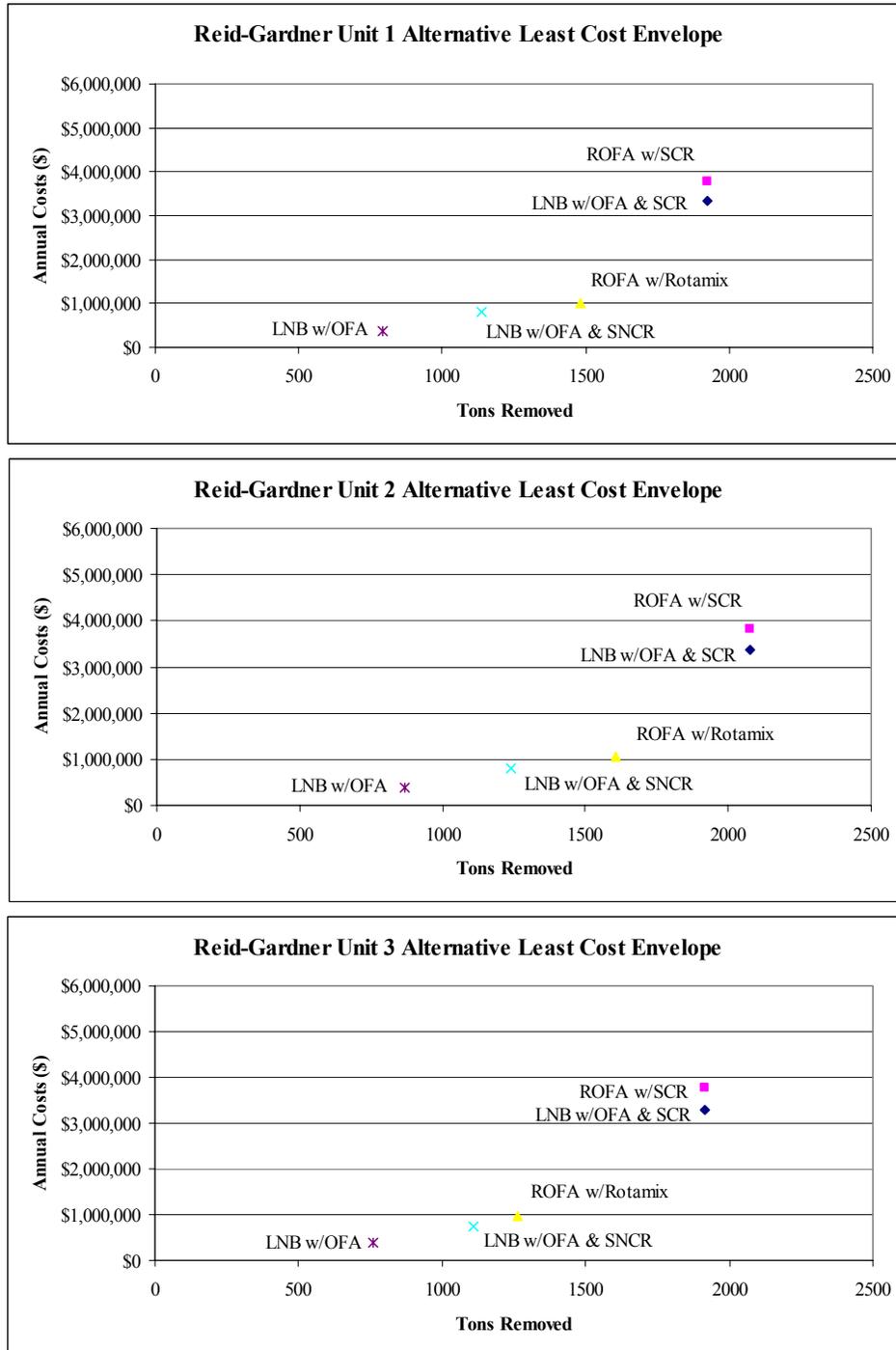
Reid-Gardner Unit 1		NOx Control				
		Current Operation (Uncontrolled)	ROFA w/SCR	LNB w/OFA & SCR	ROFA w/Rotamix	LNB w/OFA & SNCR
Capital Cost		\$38,484,900	\$35,048,000	\$7,884,900	\$6,945,500	\$4,448,000
First Year O&M Cost		\$1,313,191	\$1,029,801	\$613,952	\$396,248	\$80,000
First Year Debt Service		\$4,081,555	\$3,717,051	\$836,241	\$736,612	\$471,737
Total Annual Cost Reduced 30%		\$3,776,322	\$3,322,796	\$1,015,135	\$793,002	\$386,216
Base Heat Input (MMBtu)	9,815,313					
Total Heat Input allowed (MMBtu)	10,643,400					
Base emissions (tons)	2,267					
NOx Removal Rate %		84.8%	84.8%	65.4%	50.2%	35.1%
NOx Removed (Tons)	0	1923	1923	1482	1138	795
NOx Emission Rate (Tons)	2267	344	344	785	1129	1472
NOx Emission Rate (lb/MMBtu)	0.462	0.07	0.07	0.16	0.23	0.30
First Year Cost (\$/ton removed)		\$1,963	\$1,728	\$685	\$697	\$486
Incremental Cost (\$/ton)		\$6,251	\$5,225	\$647	\$1,184	\$486

Reid-Gardner Unit 2		NOx Control				
		Current Operation (Uncontrolled)	ROFA w/SCR	LNB w/OFA & SCR	ROFA w/Rotamix	LNB w/OFA & SNCR
Capital Cost		\$38,484,900	\$35,048,000	\$7,884,900	\$6,945,500	\$4,448,000
First Year O&M Cost		\$1,388,071	\$1,078,551	\$661,760	\$418,657	\$80,000
First Year Debt Service		\$4,081,555	\$3,717,051	\$836,241	\$736,612	\$471,737
Total Annual Cost Reduced 30%		\$3,828,738	\$3,356,921	\$1,048,601	\$808,688	\$386,216
Base Heat Input (MMBtu)	10,501,749					
Total Heat Input allowed (MMBtu)	10,643,400					
Base emissions (tons)	2,445					
NOx Removal Rate %		85.0%	85.0%	65.6%	50.6%	35.6%
NOx Removed (Tons)	0	2078	2078	1605	1238	870
NOx Emission Rate (Tons)	2445	368	368	840	1208	1575
NOx Emission Rate (lb/MMBtu)	0.466	0.07	0.07	0.16	0.23	0.30
First Year Cost (\$/ton removed)		\$1,843	\$1,616	\$653	\$653	\$444
Incremental Cost (\$/ton)		\$5,883	\$4,885	\$653	\$1,149	\$444

Reid-Gardner Unit 3		NOx Control				
		Current Operation (Uncontrolled)	ROFA w/SCR	LNB w/OFA & SCR	ROFA w/Rotamix	LNB w/OFA & SNCR
Capital Cost		\$38,484,900	\$35,048,000	\$7,884,900	\$6,945,500	\$4,448,000
First Year O&M Cost		\$1,320,114	\$1,000,893	\$543,568	\$345,970	\$80,000
First Year Debt Service		\$4,081,555	\$3,717,051	\$836,241	\$736,612	\$471,737
Total Annual Cost Reduced 30%		\$3,781,168	\$3,302,561	\$965,866	\$757,807	\$386,216
Base Heat Input (MMBtu)	10,063,851					
Total Heat Input allowed (MMBtu)	10,836,120					
Base emissions (tons)	2,268					
NOx Removal Rate %		84.5%	84.5%	55.6%	49.0%	33.4%
NOx Removed (Tons)	0	1916	1916	1262	1111	759
NOx Emission Rate (Tons)	2268	352	352	1006	1157	1510
NOx Emission Rate (lb/MMBtu)	0.451	0.07	0.07	0.20	0.23	0.30
First Year Cost (\$/ton removed)		\$1,973	\$1,724	\$765	\$682	\$509
Incremental Cost (\$/ton)		\$4,304	\$3,572	\$1,378	\$1,055	\$509

Note: Shaded Columns Represent BART, emission rates from NV Energy, and NV Energy total annual costs reduced by 30%.

FIGURE 1. ALTERNATIVE LEAST COST ENVELOPES FOR REID GARDNER UNITS 1, 2 AND 3*



*NOTE: Revised using lower NV Energy control efficiencies in lb/MMBtu and NV Energy annual costs reduced by 30 percent.

Nevada’s alternative cost analyses led NDEP to the same conclusions regarding the selection of ROFA with Rotamix as BART controls for Reid Gardner. Nevada has also discussed the FLM’s

emphasis on visibility criteria in the BART process thereby driving the process by available technology; however NDEP deems the BART process a cost-benefit analysis. Finally, Nevada has identified a 2018 reasonable progress goal that exceeds the uniform rate of progress, indicating significant progress toward the national visibility goal without the BART controls and/or limits recommended by the FLMs at Reid Gardner.

No changes were made to Nevada's RH SIP as a result of these comments.

COMMENT 8 (NPS-FWS p.5-6) NPS follow-up:

NDEP should present evidence to support its assertion that "NDEP has consistently evaluated the economic factors as part of our evaluation of proposed BART controls on a unit-by-unit basis..." NDEP explains that it used three factors (capital cost, average cost per ton, and incremental cost per ton), but does not tell how, or with what criteria, it applied them. As we noted in our previous follow-up, it appears that a consistent application of its criteria would have led to very different determinations. If NDEP lacked the modeling analyses it needed to produce an informed determination, it should have first obtained that information.

NDEP is correct in noting that the EPA BART Guidelines allow it to "choose not to analyze the other Class I areas any further as additional analyses might be unwarranted." However, we believe that it is good public policy to at least consider the consequences of that choice. If the other Class I areas were so distant as to be essentially unaffected, NDEP's choice could be justified. However, a simple inspection of the modeling results presented by NV Energy shows that, by evaluating impacts only at the closest Class I area, NDEP has ignored from 50% to 90% of the cumulative impacts at the Class I areas for which results are presented. Thus, NDEP has also ignored 50% to 90% of the benefits that would result from any reductions in emissions at the facilities.

NDEP points to the "clear breaks" in the NV Energy Table 5-4 results as proof that the more-stringent controls are too expensive. As we noted earlier, BART is not necessarily the most-cost-effective option. And, as we have shown above, those "clear breaks" can be misleading unless placed into the proper perspective. We continue to disagree that this should be a determining factor if the more-stringent controls are still reasonably cost-effective.

We agree with NDEP that, "In general, there is a linear relationship between CALPUFF modeled visibility and emission rates. The visibility improvement resulting from BART installation is expected to be proportional to the difference in modeled annual emissions and the annual NDEP BART emissions." However, if one inspects the results in NV Energy's Table 3-2 for NO_x reductions and Table 5-4 for visibility improvement, it can be seen that, if, for example, a 95 ton per year reduction due to LNBw/OFA at RGGS #3 produces an improvement of 0.407 dv at Grand Canyon, then a reduction of 1,136 tons per year after application of LNBw/OFA+SCR should produce more than the 0.652 dv improvement presented by NV Energy.¹ If NDEP is to use the NV Energy data, it must insure that the data is valid and that it is properly presented and interpreted. It is apparent that the NVE data that NDEP is using requires further explanation, at the very least. (Footnote 1: Similar inconsistencies can be found throughout the Reid Gardner analyses. For example, the NVE model results indicate that a one

ton/yr reduction by LNB will improve visibility 7.5 times as much as a one ton reduction resulting from LNB+SCR.)

NDEP follow-up response:

NDEP has consistently evaluated the proposed BART controls on a unit-by-unit basis by identifying the clear breaks in cost-benefit based on cost effectiveness and visibility improvement. Nevada utilized capital cost, average cost per ton, and incremental cost per ton as economic factors and modeled visibility or emissions reductions as visibility improvement factors. NDEP does not agree with the use of the optional cost effectiveness metric of \$/dv in our determinations as recommended by the FLM community. This position is based on Nevada’s analyses presented in NDEP’s follow-up response to NPS’ follow-up response to Comment 7. Other states have also expressed reservations regarding the use of \$/dv as a measure of cost effectiveness.

As NDEP stated in Nevada’s initial responses to FLM comments, section 5.6 of Nevada’s RH SIP discusses the visibility improvement resulting from BART implementation in Nevada. In addition, as NDEP noted in Nevada’s initial responses to FLM comments, Chapters 5 of NV Energy’s BART determination reports discuss the dispersion modeling results as well as presenting tables and figures documenting visibility improvement at all Class I areas within 300 km of the facilities. All these data were considered in NDEP’s BART determinations. However, Nevada did not rigorously utilize \$/dv as a cost effectiveness measure as this comment seems to suggest we should. NDEP deems cost benefit rather than visibility improvement as the determining factor for identifying BART, contrary to NPS philosophy. This is an area where NDEP and NPS must agree to disagree.

NPS has apparently misinterpreted the data cited from the NV Energy reports regarding the modeled visibility improvement resulting from each ton of NO_x reduction. NDEP has compiled and analyzed the cited data, as presented in Table 3. We examined the changes from baseline for each control option, as well as the changes between options. Our analysis shows the deciview improvement per ton of NO_x removed is consistent between the options out to four decimal places. NDEP deems these data to be not only valid, but also properly presented and interpreted.

TABLE 3. VISIBILITY IMPROVEMENT PER TON OF NO_x REDUCTION AT REID GARDNER

	98th percentile delta deciview reduction (dv)	visibility change from baseline (dv)	visibility change between options (dv)	annual emissions change from baseline (tpy)	annual emissions change between options (tpy)	visibility improvement per ton removed from baseline (dv/ton)	visibility improvement per ton removed between options (dv/ton)
Base	0.386						
LNB w/ OFA	0.407	0.021	0.021	95	95	0.00022	0.00022
LNB w/ OFA and SNCR	0.485	0.099	0.078	434	339	0.00023	0.00023
ROFA w/ Rotamix	0.514	0.128	0.029	556	122	0.00023	0.00024
ROFA w/ SCR	0.652	0.266	0.138	1136	580	0.00023	0.00024
LNB w/ OFA and SCR	0.652	0.266	0	1136	0	0.00023	na

No changes were made to the draft RH SIP as a result of these follow-up comments.

COMMENT 9 (NPS-FWS p.6): Comments on Reid Gardner BART Determination, Sulfur Dioxide (SO₂) NPS follow-up:

Reid Gardner is subject to BART, and BART is a federally-enforceable emission limit. NDEP should provide the 98th percentile values on which it based its BART limit. And, because NDEP believes that operating conditions and/or coal quality will change, it should identify those changes and include them in its analysis so that those assumptions can be evaluated by others.² (Footnote 2: NDEP should also explain why such changes in operations would not trigger new source review requirements.)

NDEP follow-up response:

Please see NDEP's response to USEPA comment 2, above, where NDEP explained that Nevada conducted additional evaluation of NV Energy's *BART Analysis for Reid Gardner Station Unit 1* and the analyses for units 2 and 3, as well as analysis of the emissions data collected under the auspices of 40 CFR Part 60. These efforts lead NDEP to establish a revised SO₂ BART limit for Reid Gardner at 0.15 lb/MMBtu. Text, figures and tables in this SIP as described in Nevada's response to USEPA comment 2, as well as text in NDEP's BART review for Reid Gardner were modified to reflect the change in SO₂ BART emission limits for Reid Gardner and its ramifications.

In addition, please see Nevada's response to NPS follow-up Comment 6 above, which discusses the operational challenges presented by the installation of retrofit technology at Reid Gardner unit 4.

Operational conditions related to boiler draft balance and/or coal quality are not permit conditions. As such, modification of these operational conditions does not trigger new source review requirements. No changes were made to Nevada's draft RH SIP as a result of this comment.

COMMENT 10 (NPS-FWS p.6) NPS follow-up:

NDEP should duly resolve this during the BART process. [NOTE: "This" refers to an NPS issue with the averaging periods for the SO₂ BART emission limits at Reid-Gardner.]

NDEP follow-up response:

NDEP has addressed a similar comment in Nevada's response to USEPA Comment 2 in section 2.2.2.2 of this appendix.

NDEP expects NV Energy will operate the post-BART Reid Gardner Generating Station much as it has historically and will achieve actual emission rates consistent with the highly efficient recent operational history of the facility, which has achieved the low SO₂ emission rates noted by the FLMs. It is improbable that the facility will have emissions as high as 0.15 lb/MMBtu for extended periods or operate at full capacity year round.

No changes were made to the draft RH SIP as a result of this comment.

COMMENT 12 (NPS-FWS p.7) NPS follow-up:

Condensable PM is generally understood to be a significant component of PM emissions from fossil-fuel-fired EGUs, and the CALPUFF model used by NV Energy to model emissions is capable of, and was used for modeling condensable PM emissions. NDEP is incorrect in its assertion that “there is no post-combustion technology to directly control condensable particulate emissions.” Wet electrostatic precipitators are commonly installed for this purpose, and reagents have been recently developed to suppress the formation of SO₃ which leads to emissions of H₂SO₄.

NDEP follow-up response:

USEPA is currently implementing the new source review (NSR) program for PM_{2.5}. There are a number of outstanding issues related to NSR for PM_{2.5}. For instance, there is little or no information on PM_{2.5} emissions from stationary sources, reference test methods have not been promulgated, and the reference test method that was developed for condensable PM was flawed. Currently there is a lack of necessary tools to estimate emissions of PM_{2.5} and related precursors. Similar issues exist for condensable PM₁₀. Until USEPA has determined how BACT and LAER, and other aspects of NSR will be handled for condensables and precursors, NDEP deems it unreasonable to consider condensable PM under BART.

Reid Gardner recently installed pulse jet fabric filter as part of an environmental upgrade project for units 1, 2 and 3 under the conditions of a consent decree between USEPA, NDEP and NV Energy. Fabric filter is BART for PM₁₀ at Reid Gardner. The potential level of emissions reduction for electrostatic precipitators is not as great as the fabric filter and was eliminated from further consideration as BART for Reid Gardner.

No changes were made to Nevada’s draft RH SIP as a result of this comment.

COMMENT 13 (NPS-FWS p.7): Nitrogen Oxides (NO_x) NPS follow-up:

While true, the generalities presented by NDEP do not address the question of why a specific boiler (RGGGS #3) should be allowed to emit more NO_x after installation of similar BART controls than similar boilers at RGGGS with higher pre-BART emissions and similar BART controls. And, we still do not see how the higher emission rates for RGGGS Unit 3 are further explained in NDEP’s response to the next USDOJ comment.

NDEP follow-up response:

NDEP research has identified inconsistencies between the NV Energy Reid Gardner BART reports and operating permit regarding the dates of commission and when the three BART units were placed into operation. Reid Gardner unit 1 was manufactured in 1965, unit 2 in 1968, and unit 3 was manufactured in 1976, based on information from the permits. The differences in manufacture date may account for some of the variability in controlled NO_x emission rates exhibited by the three units.

In addition, based on NV Energy’s experience with installation of the ROFA system on Reid Gardner unit 4, described in Nevada’s response to follow-up comment 6 above, NDEP is not certain that the manufacturer’s guarantees are necessarily achievable. The tuning of ROFA on unit 4 has taken much longer than originally anticipated, and the guaranteed value has been

difficult to obtain. The engineering team has had to continuously revise their approach to installation of the ROFA, including changing coal burner components and air ducting for the boiler. NV Energy's operational experience with ROFA was a factor in setting the higher BART emission limit for unit 3.

No changes were made to Nevada's draft RH SIP as a result of this comment.

COMMENT 14 (NPS-FWS p.7) NPS follow-up:

We disagree that "...assumptions presented by NV Energy do not vary significantly from engineering norms..." Differences between 6% and 15% control, and between 24% and 63% control are significant. Good combustion controls are the foundation for any NO_x reduction strategy. If that foundation is not strong, then the add-on controls will be hampered in their effectiveness and their costs will increase.

NDEP follow-up response:

This NPS follow-up comment refers to control efficiencies for combustion controls, specifically LNB with OFA at Reid Gardner. The BART control technology identified by NDEP for Reid Gardner, ROFA with Rotamix, combines combustion control with reagent injection and has control efficiencies twice those of LNB with OFA and correspondingly lower emission rates. This comment appears to be moot in light of the BART control technology selected by NDEP. No changes were made to Nevada's draft RH SIP as a result of this comment.

COMMENT 15 (NPS-FWS p.7) NPS follow-up:

NDEP has based its analyses of the costs of combustion controls plus SCR on the assumptions that this combination of controls can achieve annual emission rates no lower than 0.083 – 0.098 lb/mmBtu. It appears that NDEP arrived at these emission rates counter to the approach used by NVE in which NVE estimated the emission rate that was achievable and then calculated the corresponding reduction efficiencies. Although we believe that NVE has underestimated the ability of SCR to achieve lower emissions, we agree with its approach and it the approach taken by the overwhelming majority of BART sources across the nation.

Instead, NDEP used the "artificially" calculated control efficiencies that resulted from NVE's emission estimates, and then applied those artificial values to its escalated baseline emission and heat input scenarios. As a result, not only are the NDEP emission rates higher than the 0.07 lb/mmBtu rate presented by NVE, they are higher than the emission rates demonstrated in practice (as illustrated by the updated CAM data we are submitting) and higher than the vendor guarantees.³ NVE and NDEP should re-evaluate SCR on the basis that it can achieve an annual emission rate of 0.05 lb/mmBtu. (Footnote 3: For example, Minnesota Power has stated in its Taconite Harbor BART analysis that "The use of an SCR is expected to achieve a NO_x emission rate of 0.05 lb/mmBtu based on recent emission guarantees offered by SCR system suppliers.")

NDEP follow-up response:

NDEP has evaluated lower emission rates (i.e., higher control efficiency percentages) and reduced costs in alternative cost analyses of BART controls for Reid Gardner, as described in NDEP's response to NPS follow-up comment to Comment 7, above. The alternative cost analyses led NDEP to the same determination of BART for Reid Gardner, ROFA with Rotamix.

COMMENT 16 (NPS-FWS p.7-8) NPS follow-up:

The Boardman costs represent an unusual situation in which a \$40 million capital cost would be included for modification of the boiler to reduce outlet temperatures to a range that would accommodate SCR.⁴ Unless NVE can show that it would experience unusual costs, then we believe that the cost values cited (and again included) are fair representations of typical SCR costs. (Footnote 4: NDEP can learn more about this at <http://www.deq.state.or.us/aq/haze/pge.htm>)

NDEP should also recognize that the “average and median total capital investment of \$320 and \$301/kW for SCR and \$346 to \$334/kW for combustion control plus SCR” is based almost entirely on data presented by sources that have rejected SCR, and thus have a large financial interest in convincing their regulatory agencies to agree. When we compare those industry estimates to the “real-world” data compiled for the Electric Power Research Institute and the Boardman reports, we suspect that the industry cost data to which NDEP referred is inflated. We hope that NDEP would exercise caution in evaluating data from sources with clear conflicts of interest. In addition, we suggest that NDEP consider the information presented by Minnesota Power to the Minnesota Public Utilities Commission in which it estimated that addition of SCR would cost \$205/kW at its Clay Boswell unit #3.

NDEP follow-up response:

NDEP has determined BART on a case-by-case basis in consideration of the factors listed in Part 51 Appendix Y guidance. In addition, NDEP conducted alternative cost analyses to evaluate whether inflated costs and/or lower achievable emission rates would change our BART determinations for Reid Gardner. The alternative cost analyses, described above under Comment 7, led NDEP to conclude our initial BART determination was sound.

Because Nevada determined BART on a case-by-case basis, the cost information presented by NPS is of passing interest. However, NDEP does note NPS has a tendency to present those cost data in support of their positions while disavowing those data that don't support their positions, although the referenced cost data compilation was conducted by NPS. The NPS points NDEP directly to cost data for one facility to support SCR as BART, while, as they state above, many other facilities have rejected SCR as BART. NDEP asserts that it does exercise caution in evaluating data from outside sources.

No changes were made to Nevada's RH SIP as a result of this comment.

NPS follow-up:

It appears that NDEP has somehow concluded that our “NPS version of corrected OAQPS Cost Manual...” spreadsheets represent some radical revision of the EPA OAQPS Control Cost manual approach recommended by the BART Guidelines. Instead, the “correction” to which the file's title refers is in the original version of that workbook that used the example problem in the Cost Manual as a check. In the process of developing the workbook, it was discovered that some errors had occurred in the Cost Manual's presentation of its example, and those errors were corrected (with the cooperation of OAQPS). We suggest that NDEP become more familiar with the methods employed by the Cost Manual and the workbook based upon it. If NDEP then finds that there really is an error or deviation in the workbook, we would be pleased to work with NDEP (and OAQPS) to correct it.

We are unaware that the OAQPS Control Cost manual must be “properly vetted through a public process” in order for NDEP to accept the science inherent in its methods. And, while we have made our workbook available to all as an aid toward evaluating the costs of SCR, if NDEP wishes to use a different approach, it is welcome to do so, provided that it presents adequate rationales, explanations, and justification.

NDEP follow-up response:

NDEP appreciates NPS explaining the changes it made to the Cost Manual and the workbook based upon it. This is the first explanation we have seen of how the NPS version of the corrected OAQPS Cost Manual was modified in conjunction with OAQPS. Can NPS point NDEP to OAQPS’ announcement and documentation of these changes for NDEP review? NDEP is skeptical of utilizing undocumented resources from outside sources without further evaluation.

NPS concurs with NDEP’s BART technology determinations, as stated in its follow-up to Comment 7, for all Nevada’s subject-to-BART sources except Reid Gardner. So these comments are moot, except for Reid Gardner. NDEP has evaluated how lower costs might affect our BART determination for Reid Gardner with alternative cost analyses, described in NDEP’s response to NPS’ follow-up comment to Comment 7. The alternative cost analyses confirm NDEP’s determination of BART technology for Reid Gardner. No changes were made to Nevada’s RH SIP as a result of this comment.

NPS follow-up:

The data available to NPS lead us to believe that costs for a typical SCR installation range from \$50 – 250/kW. NVE has provided no documentation or justification for its much higher costs. If NVE cannot provide the documentation and justification to support its estimates, then it should use the Cost Manual approach to generate estimates that are consistent and transparent. We are simply doing exactly that.

NDEP follow-up response:

The Part 51 Appendix Y guidance states that BART is a case-by-case determination. The use of \$/kW is an optional measure of cost effectiveness not identified in Appendix Y. In addition, see NDEP’s follow-up response to the NPS follow-up to Comment 7 above, where NDEP references its alternative cost analyses. No changes were made to Nevada’s RH SIP as a result of this comment.

NPS follow-up:

We believe that BART decisions should be made in the context of other decisions made by a particular state, and in the context of decisions made by other states, in much the same manner as Best Available Control Technology determinations. This promotes the concept of the “level playing field.” We also encourage states to consider the unique circumstances particular to a given source and its impacts upon Class I areas in its vicinity. At the very least, a state should be internally consistent in its determinations, or provide information describing any apparent inconsistencies.

NDEP follow-up response:

As NDEP stated in our response to the NPS follow-up comment above, NDEP views BART as a case-by-case determination, consistent with Appendix Y guidance. NDEP has consistently determined BART through identification of clear breaks in the cost effectiveness measures identified in Appendix Y guidance and visibility improvement/emissions reductions at the affected Class I areas. Nevada notes that NPS concurs with NDEP's BART technology determinations for all but one of Nevada's subject-to-BART facilities.

No changes were made to Nevada's RH SIP as a result of this comment.

COMMENT 17 (NPS-FWS p.8) NPS follow-up:

Although NDEP did not address our comments, it is correct in noting that the EPA BART Guidelines allow it to "choose not to analyze the other Class I areas any further as additional analyses might be unwarranted." However, we believe that it is good public policy to at least consider the consequences of that choice. If the other Class I areas were so distant as to be essentially unaffected, NDEP's choice could be justified. However, a simple inspection of the modeling results presented by NV Energy in Table 5-3 of its submittals shows that, by only evaluating impacts at the Grand Canyon, NDEP has ignored half of the cumulative impacts at the five Class I areas for which results are presented. Thus, NDEP has also ignored half of the benefits that would result from any reductions in emissions at RGGGS.

NDEP follow-up response:

This comment duplicates a portion of the NPS follow-up comment to Comment 8; see NDEP's follow-up response to Comment 8.

The original FLM Comment 17 suggests cost benchmarks based on the \$/dv cost effectiveness metric. As NDEP has noted above, BART is a case-by-case determination and is not determined by cost benchmarks at other facilities. NDEP has chosen not to use the optional \$/dv cost effectiveness metric for the reasons discussed in our response to NPS follow-up comment to Comment 7.

In addition, NDEP disagrees with the NPS statement that Nevada did not consider visibility improvement in its BART determinations. NDEP discusses visibility improvement resulting from the implementation of BART at Nevada sources in section 5.6, "Visibility Improvement Due to BART Implementation" of Nevada's RH SIP. In the cases where limited modeling was performed, NDEP utilized emissions reductions in lieu of visibility improvement, since modeled visibility improvement is proportional to emission rates. Finally, regional visibility modeling demonstrates Nevada's 2018 reasonable progress goal for Jarbidge is below the uniform rate of progress and that Nevada's emission reductions are consistent with our share of visibility impairment at Class I areas in adjacent states.

No changes were made to Nevada's RH SIP as a result of this comment.

NPS follow-up:

We disagree and suggest that NDEP reconsider the cost information provided by NVE by taking a fresh look at the data we have provided,⁵ as well as its background. While it is true that it is the role of the states (or EPA when the state fails) to establish BART, that does not preclude DOI

from concluding that NDEP should re-evaluate what constitutes reasonable average cost effectiveness. We would be pleased to share any additional information we have, if NDEP wishes to pursue this. (Footnote 5: Our compilations of BART proposals can be found at <http://www.wrapair.org/forums/ssjf/bart.html>)

NDEP follow-up response:

Nevada has addressed this cost issue in NDEP's response to NPS follow-up comments to Comment 7 by noting NDEP's alternative cost analyses incorporate NPS' cost concerns by reducing NV Energy costs by 30 percent, as well as EPA guidance that BART determinations are conducted on a case-by-case basis.

NDEP appreciates NPS' effort in compiling the referenced cost data. However, without additional documentation of these compilations, it is difficult to utilize these data or to place them in meaningful context (e.g., Do the costs represent controls identified as BART or only proposed as BART? [see NPS follow-up comment to Comment 16]). NDEP is unaware of the documentation NPS suggests it has provided as background for the data NPS references in this comment. No changes have been made to Nevada RH SIP as a result of this comment.

NPS follow-up:

The BART Guidelines require that NDEP consider the effects of the technically feasible options on visibility. Because there are no "traditional measures of cost effectiveness," to rely upon in this context, we have suggested that \$/dv can be a useful metric in doing so. (It appears that NV Energy and NDEP must also find some value to this metric, as they both presented \$/dv values in their BART analyses.) And, if NDEP were to inspect the information we provided to it recently in our compilation of BART proposals, it would find that \$/dv is being used by many other states and BART sources. And, we believe that the \$/dv metric inherently addresses the concern expressed by NDEP about its uncertainty about "how the number and placement of Class I areas with respect to the facility may affect the usefulness of \$/deciview as an effectiveness measure"—the calculation of the impact in dv is directly related to the relative locations of the source and the Class I area, and the cost value is completely objective and fits the "traditional" approach that NDEP desires.

NDEP follow-up response:

As NDEP has noted above, Nevada views BART as a case-by-case determination, while EPA guidance in Appendix Y directs states to use average and incremental costs to determine the reasonableness of compliance costs. The \$/dv metric suggested by NPS is an optional cost effectiveness measure that NDEP has chosen not to utilize due to its inherent uncertainties. It is clear that other states have similar reservations, as noted by Oregon DEQ for the Boardman Power Plant, which states¹²:

"There are several different metrics that can be considered when evaluating the cost-benefit relationships of different emission control technologies. A commonly used metric is dollars per ton of pollution reduced (\$/ton). Another common metric is the incremental cost difference between one control option and another. The Department believes that the metrics of dollars per ton and incremental cost differences best express the relative value of

¹² DEP BART Report for the Boardman Power Plant, updated December 19, 2008, prepared by Oregon Department of Environmental Quality, page 23, available at <http://www.deq.state.or.us/aq/haze/docs/deqBartReport.pdf>

various control options and are most comparable with other decision making processes used by state and federal air quality agencies to evaluate emission controls for major industry. As discussed in the next section, the Department has also evaluated the amount of visibility improvement gained in relation to cost in dollars per deciview improvement (\$/dv). Dollars per deciview can be informative and important to consider, however this type of metric is not commonly used to assess the cost effectiveness of industrial controls and has more inherent uncertainty in expressing the full visibility and environmental benefit of any given option. This uncertainty potentially makes this metric less helpful than \$/ton or incremental costs. “

Finally, the NPS compilation of BART proposals does not provide context regarding how the states utilized these data in their BART determination process (as NDEP discussed in our response to NPS’ follow-up comment above). Nevada’s evaluation of \$/dv as a cost effectiveness metric is presented in NDEP’s follow-up response to NPS’ follow-up comment to Comment 7.

No changes were made to Nevada’s RH SIP as a result of these comments.

NPS follow-up:

We suggest that NDEP reconsider its position in view of our discussion of the OAQPS Control Cost manual and the workbook we created base upon that document.

NDEP follow-up response:

Nevada appreciates the efforts by the FLM community to modify the Control Cost Manual. Given the opportunity, NDEP will review the documentation regarding the changes OAQPS and NPS made to the Control Cost Manual and the workbook NPS created.

NDEP has chosen to utilize the control costs derived by the facilities on a case-by-case basis. In addition, NDEP has evaluated the cost concerns expressed by the FLM community in alternative cost analyses, discussed in NDEP’s response to NPS’ follow-up comment to Comment 7. No changes were made to Nevada’s RH SIP as a result of this comment.

COMMENT 18 (NPS-FWS p.9) NPS follow-up:

NDEP is correct in noting that the EPA BART Guidelines allow it to “choose not to analyze the other Class I areas any further as additional analyses might be unwarranted.” However, we believe that it is good public policy to at least consider the consequences of that choice. If the other Class I areas were so distant as to be essentially unaffected, NDEP’s choice could be justified. However, a simple inspection of the modeling results presented by NV Energy shows that, by evaluating impacts only at the closest Class I area, NDEP has ignored from 50% to 90% of the cumulative impacts at the Class I areas for which results are presented. Thus, NDEP has also ignored 50% to 90% of the benefits that would result from any reductions in emissions at the facilities.

NDEP follow-up response:

This comment duplicates NPS’ follow-up comments to Comment 8 and Comment 17. Please see NDEP’s follow-up responses to these NPS follow-up comments.

NPS follow-up:

We agree with NDEP that, “In general, there is a linear relationship between CALPUFF modeled visibility and emission rates. The visibility improvement resulting from BART installation is expected to be proportional to the difference in modeled annual emissions and the annual NDEP BART emissions.” However, if one inspects the results in NV Energy’s Table 3-2 for NO_x reductions and Table 5-4 for visibility improvement, it can be seen that, if, for example, a 95 ton per year reduction due to LNBw/OFA at Reid Gardner #3 produces an improvement of 0.407 dv at Grand Canyon, then a reduction of 1,136 tons per year after application of LNB w/OFA+SCR should produce more than the 0.652 dv improvement presented by NV Energy.⁶ If NDEP is to use the NV Energy data, it must insure that the data is valid and that it is properly presented and interpreted. It is apparent that the NVE data that NDEP is using requires further explanation, at the very least. (Footnote 6: Similar inconsistencies can be found throughout the Reid Gardner analyses. For example, the NVE model results indicate that a one ton/yr reduction by LNB will improve visibility 7.5 times as much as a one ton reduction resulting from LNB+SCR.)

NDEP follow-up response:

This comment duplicates NPS’ follow-up comment to Comment 8. Please see NDEP’s follow-up response to Comment 7, above.

COMMENT 19 (NPS-FWS p.8) NPS follow-up:

NDEP is correct in noting that the EPA BART Guidelines allow it to “choose not to analyze the other Class I areas any further as additional analyses might be unwarranted.” However, we believe that it is good public policy to at least consider the consequences of that choice. If the other Class I areas were so distant as to be essentially unaffected, NDEP’s choice could be justified. However, a simple inspection of the modeling results presented by NV Energy shows that, by only evaluating impacts at the closest Class I area, NDEP has ignored from 50% to 90% of the cumulative impacts at the Class I areas for which results are presented. Thus, NDEP has also ignored 50% to 90% of the benefits that would result from any reductions in emissions at these facilities.

NDEP follow-up response:

This comment duplicates NPS’ follow-up comments to Comments 8, 17 and 18. Please see NDEP’s follow-up responses to these NPS follow-up comments.

COMMENT 20 (NPS-FWS p.9-10): Comments on BART determinations for Ft. Churchill, Mohave and Tracy EGUs. NPS follow-up:

It appears that NDEP arrived at its emission rates counter to the approach used by NVE in which NVE estimated the emission rate that was achievable and then calculated the corresponding reduction efficiencies. Instead, NDEP used the “artificially” calculated control efficiencies that resulted from NVE’s emission estimates, and then applied those artificial values to its escalated baseline emission and heat input scenarios. As a result, the NDEP emission rates are often higher than the rates presented by NVE. We agree with NVE’s approach and it is the approach taken by the overwhelming majority of BART sources across the nation.

NDEP follow-up response:

NPS has reached the same conclusion as NDEP regarding the determination of BART control technology for these facilities; see NPS follow-up response to Comment 7. Therefore, no changes were made to Nevada's RH SIP as a result of this comment.

COMMENT 21 (NPS-FWS p. 10) NPS follow-up:

Instead of showing "problems with the \$/dv improvement as a measure of cost effectiveness" as NDEP contends, the NDEP response simply highlights the problems in its approach to improving visibility by focusing on other parameters unrelated to visibility improvement. As a result, NDEP has created a BART program that would allow the source that causes the most visibility impairment to spend less per unit of visibility improvement than a source that causes far less impairment. We believe that placing more weight on \$/dv provides a clear and objective way to produce BART determinations that recognize the unique situation and impacts of a given source on visibility in the Class I areas that it affects.

NDEP follow-up response:

The original FLM comment refers to NDEP's BART determinations for Fort Churchill, Tracy and Mohave Generating Stations. NPS has reached the same conclusions regarding the BART control technologies for these facilities, so this comment has little relevance. However, NDEP has determined BART on a case-by-case basis and does not subscribe to cost benchmarks, especially those based on the use of \$/dv as a cost effectiveness metric. Nevada has explained our rationale for these positions in NDEP's follow-up responses to NPS follow-up comments as presented above. In addition, NDEP believes NPS has emphasized visibility improvement in the BART determination process more than is supported by the RHR.

NPS' follow-up comment implies that NDEP has determined BART for Reid Gardner without significant cost implications to the facility. Nevada notes the capital cost of implementation of BART at Reid Gardner is more than \$20 million, nearly three times the capital cost for any other Nevada facility and the capital cost per unit is nearly twice that for any other Nevada unit. Modeled visibility improvement resulting from BART implementation at each Reid Gardner unit is nearly double the visibility improvement at the closest Class I area for any other Nevada subject-to-BART facility. Nevada's implementation of its BART program makes reasonable progress toward the national visibility goal.

NPS Comments on NDEP BART Determination Reviews

NDEP prepared BART determination reviews of the BART reports submitted by NV Energy for their subject-to-BART facilities, as noted in Appendix B of this SIP. NDEP reviews were conducted for the Fort Churchill, Tracy and Reid Gardner Generating Stations¹³. NPS included comments regarding these review documents in their May 20, 2009 letter.

However, since NPS has stated its concurrence with NDEP's BART determinations for Fort Churchill and Tracy, NDEP believes that no changes to this SIP are necessary and has therefore not responded to NPS comments regarding NDEP's review documents for these two facilities. NDEP responds to NPS comments regarding the Reid Gardner review document below.

¹³ The reports are available at <http://ndep.nv.gov/baqp/planmodeling/rhaze.html>.

Nevada has listed the major sections of the NDEP review report in bold text below, followed by NPS comments in italics. The NDEP responses, in plain text, follow the NPS comments.

STEP 1 – Identify all available retrofit emissions control techniques

NPS:

NDEP evaluated a reasonable spectrum of control options.

NDEP response:

Nevada concurs. No changes were made to Nevada's RH SIP as a result of this comment.

STEP 2 – Eliminate technically infeasible options

NPS:

While we agree with the basic premise that upgrading the existing scrubbers is the most practical approach and no analysis of other is therefore necessary, that is only true if the BART emission limit represents the 95% reduction capability of the control strategy.¹ (Footnote 1. According to NVE, "The projected emission rate for an upgraded wet soda ash FGD system for Reid Gardner 1 is 95 percent SO₂ removal or less than 0.15 lb/mmBtu, while a new wet lime/limestone scrubber installation would have similar removal efficiency. Essentially the same level of SO₂ reduction can be achieved through scrubber upgrades and new wet scrubber installation. Therefore, the new wet lime/limestone scrubber option is eliminated because little additional scrubber capital or operating cost is required by improving the current wet soda ash scrubber.")

NDEP response:

The existing wet soda ash FGD system arguably represents the most effective SO₂ control technology available and has historically achieved SO₂ removal rates as high as 95 percent. Only a new wet lime/limestone scrubber has similar control efficiencies. NDEP did not consider a new scrubber during the BART determination for the simple reason that it doesn't make sense to spend capital replacing an existing system with a new system that has essentially equal control performance.

This NPS comment then becomes a question of the SO₂ emission limit, which Nevada has addressed in NDEP's responses to USEPA Comment 2 and NPS follow-up comments to Comment 9 and 10 in Appendix D.2. Please see NDEP's response to USEPA comment 2, which identifies where changes were made to the SIP as a result of comments on the SO₂ BART emission limit for Reid Gardner.

STEP 3 – Evaluate control effectiveness of remaining control options

NPS:

*This is a misleading statement. NVE estimated the **emission rate** that could be achieved by each control technology option. Instead, NDEP used the "artificially" calculated control efficiencies that resulted from NVE's emission estimates, and then applied those artificial values to its escalated baseline emission and heat input scenarios.*

For example, for the LNB with Selective Catalytic Reduction (SCR) option, NDEP assumed 0.083 – 0.098 lb/mmBtu. However, NVE estimated that it could achieve 0.07 lb/mmBtu. EPA Clean Air Markets (CAM) data (Appendix A) and vendor guarantees² show that SCR can typically meet 0.05 lb/mmBtu on an annual average basis. Neither NVE nor NDEP have provided any documentation or justification to support the higher values used in their analyses. (Footnote 2. Minnesota Power has stated in its Taconite Harbor BART analysis that “The use of an SCR is expected to achieve a NO_x emission rate of 0.05 lb/mmBtu based on recent emission guarantees offered by SCR system suppliers.”)

NDEP response:

Nevada evaluated the influence of the emission rate in the BART determination process by conducting alternative cost analyses for Reid Gardner as described in NDEP’s response to NPS follow-up to Comment 7 above. No changes were made to Nevada’s RH SIP as a result of this comment.

STEP 4 – Impact analysis

NPS:

NVE has overestimated the cost of SCR. The BART guidelines advise that:

The basis for equipment cost estimates also should be documented, either with data supplied by an equipment vendor (i.e., budget estimates or bids) or by a referenced source (such as the OAQPS Control Cost Manual, Fifth Edition, February 1996, EPA 453/B-96-001). In order to maintain and improve consistency, cost estimates should be based on the OAQPS Control Cost Manual, where possible.

NVE failed to provide justification or documentation for its cost estimates. As a result, the NDEP estimates for SCR at RGGGS equate to capital costs of \$350/kW for units #1 - #3, compared to the \$50 - \$267/kW typical cost of SCR found in survey data (Appendix B).

NDEP response:

Nevada evaluated the influence of cost in the BART determination process by conducting alternative cost analyses for Reid-Gardner as described in NDEP’s response to NPS follow-up to Comment 7 above. No changes were made to Nevada’s RH SIP as a result of this comment.

STEP 5 – Determine visibility impacts

NPS:

NDEP should have continued the five-step analysis by evaluating the visibility benefits of at least the more-stringent technically-feasible control options that it rejected. Furthermore, RGGGS’ impacts at Grand Canyon represent only 49% of its cumulative impact on the five Class I areas modeled. By focusing on only the Grand Canyon Class I area, NDEP ignored the impacts at the other four Class I areas affected by this facility.

NDEP response:

Nevada discusses the evaluation of the visibility benefits in NDEP’s response to NPS follow-up to Comments 8, 17, 18 and 19. No changes were made to Nevada’s RH SIP as a result of this comment.

NDEP Analysis

NPS:

We believe that a proper consideration of the cost-effectiveness of reducing NO_x to improve visibility (e.g., \$/dv) would lead to the conclusion that LNB+SCR with an emission level at 0.05 lb/mmBtu (annual average) is BART.³ (Footnote 3. Because visibility is a short-term Air Quality Related Value, we recommend that states set corresponding short-term limits. For example, our data suggests that an annual average emission rate of 0.05 lb/mmBtu equates to a 30-day rolling average of 0.06 lb/mmBtu and a 24-hour block average rate of 0.07 lb/mmBtu.) Even if we use NDEP's cost estimates and modeling results, the cumulative benefits of improving visibility in the five Class I areas impacted by RGGGS are less than \$4 million/dv for each unit, which is well below the \$10 - \$17 million /dv means for BART proposals nationwide,⁴ (Footnote 4. Our compilations of BART proposals can be found at <http://www.wrapair.org/forums/ssjf/bart.html>) and even below the \$9.8 million/dv that NDEP determined was reasonable to reduce NO_x at TGS #3.

We used EPA's OAQPS Control Cost Manual (as recommended by the BART Guidelines) to estimate cost-effectiveness values of \$1,570/ton for RGGGS #1, \$1,346/ton for RGGGS #2, and \$1,660/ton for RGGGS #3 which are significantly less than the \$3,050/ton that NDEP determined was reasonable at TGS #1 for LNB+FGR. (Our analyses are contained in Appendix C.)

We used NVE's modeling results to derive estimates of visibility improvement that would result from our greater annual emissions reductions and translated that to cost-effectiveness values of \$1.8 - \$2.5 million/dv at Grand Canyon and \$0.9 - \$1.2 million/dv across the five Class I areas modeled.⁵ (Footnote 5. RGGGS #1 @ \$2.5 million/dv at Grand Canyon and \$1.2 million/dv across the five Class I areas modeled. RGGGS #2 \$2.1 million/dv at Grand Canyon and \$1.0 million/dv across the five Class I areas modeled. RGGGS #3 \$1.8 million/dv at Grand Canyon and \$0.9 million/dv across the five Class I areas modeled.) The benefits of improving visibility in Grand Canyon NP and the other four Class I areas impacted by RGGGS are well below the \$10 - \$17 million /dv means for BART proposals nationwide,⁶ (Footnote 6. Our compilations of BART proposals can be found at <http://www.wrapair.org/forums/ssjf/bart.html>) and even below the \$9.8 million/dv that NDEP determined was reasonable to reduce NO_x at TGS #3.

NDEP response:

Nevada considers the BART process a case-by-case determination of the costs and benefits of visibility improvement. Visibility improvement is only one of the five factors states must consider in the BART determination process, although NPS seems to indicate visibility should drive the process. Since BART is a case-by-case determination, Nevada has not considered benchmarks in our BART determinations, as suggested by NPS. Because of the inherent uncertainty of \$/dv as a cost effectiveness measure, Nevada does not subscribe to its use in the BART process and certainly not as a cost-effectiveness benchmark. NDEP has more thoroughly discussed these issues in our responses above.

No changes were made to Nevada's RH SIP as a result of this comment.

NPS:

It is not clear how NDEP arrived at emission limits⁸ (Footnote 8. Because BART is an emission limit, simply specifying the control technology with the expectation that it will perform to the fullest of its capabilities is not adequate.) that are more than six times higher than the 2007 annual average SO₂ emission rates (0.035 – 0.039 lb/mmBtu) for these units. According to NVE:

It is projected that the operation of the present wet soda ash FGD system may be improved as a result of the fabric filter installation. However, even with incremental improvements, minimal additional improvement to the current low SO₂ emission level can be consistently expected from upgrades to the existing wet soda ash scrubber. Only scrubber upgrades and new lime/limestone wet scrubber technology options can equal or exceed the removal efficiency of the current wet soda ash scrubber. Therefore, only these two alternatives are considered technically feasible for purposes of this analysis... When evaluating the control effectiveness of SO₂ reduction technologies, each option can be compared against benchmarks of performance. The projected emission rate for an upgraded wet soda ash FGD system for Reid Gardner 1 [as well as 2 and 3] is 95 percent SO₂ removal or less than 0.15 lb/MMBtu, while a new wet lime/limestone scrubber installation would have similar removal efficiency.

NDEP should provide more information concerning its statistical analysis and explain in detail the factors⁹ (Footnote 9. uncertainties in future coal supply for this facility and changes in boiler operation from the current pressurized operation to balanced draft operation, as well as the Clean Air Act factors of expected emission rates, emissions performance levels, expected emissions reductions, costs of compliance, energy impacts, non-air quality environmental impacts and modeled visibility impacts) it used to arrive at its proposed BART limit.

NDEP response:

Please see NDEP's response to USEPA comment 2, which responds to a similar comment and identifies where changes were made to the SIP as a result of comments on the SO₂ BART emission limit for Reid Gardner, including lowering the SO₂ BART emission limit to 0.15 lb/MMBtu from 0.25 lb/MMBtu.

NPS:

NDEP should explain why the new fabric filters at RGGS cannot achieve the same 0.010 lb/mmBtu rate it proposed in the Toquop and Ely draft permits.

NDEP response:

The fabric filters at Reid Gardner will be installed upstream of the wet soda ash scrubbers and so will not capture any particulates generated by the scrubbers. The guaranteed filterable particulate emissions from the fabric filter are 0.015 lb/MMBtu. In addition, installation of fabric filter at Reid-Gardner is a retrofit, unlike Toquop and Ely where fabric filter is a design component of the air pollution control system.

SECTION D.2.2.4

CONSORTIUM OF CONSERVATION ORGANIZATIONS

2.2.4 Consortium of Conservation Organizations (NGOs)

2.2.4.1 Comment Letter

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John M Barth

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National Parks Conservation Association * Western Resource Advocates * Nevada National Wildlife Federation * Bristlecone Alliance * Center for Biological Diversity * Nevada Conservation League and Education Fund * Wasatch Clean Air Coalition * Citizens for Dixie's Future * Public Resource Associates * Sevier Citizens for Clean Air and Water * Post Carbon Salt Lake * Sierra Club * Grand Canyon Trust * Utah Moms for Clean Air

May 20, 2009

By email (amalone@ndep.nv.gov) and fax (775-687-6396)

Adele Malone

Nevada Division of Environmental Protection

901 S. Stewart Street, Suite 4001

Carson City, NV 89701

Re: Comments on Nevada's Draft Regional Haze State Implementation Plan

Dear Ms. Malone:

The undersigned conservation organizations submit the following written comments on Nevada's draft regional haze state implementation plan ("RH SIP"). These comments may be supplemented by oral comments at the May 20, 2009 public hearing.

These written comments also incorporate by reference the expert report entitled "Technical Review of Draft Nevada State Implementation Plan for Regional Haze (April 2009)" ("Technical Review") prepared by Air Resource Specialists, Inc. and which is attached hereto.

For the reasons stated herein and in the attached Technical Review, Nevada's Draft RH SIP is legally and technically flawed and underestimates regional haze causing emissions from sources in Nevada. The RH SIP's failure to accurately account for haze forming emissions results in an inaccurate conclusion that Nevada is on the "glide path" to achieving its regional haze goals. To the contrary, Nevada failed to accurately account for at least three proposed coal fired-power plants in the state that will cause excessive haze forming emissions and prevent reasonable progress toward achieving the elimination of regional haze in Nevada and neighboring Utah. Moreover, Nevada also incorrectly takes future credit for reduction in emissions from the Mohave power plant despite the fact that the plant has not been operational since 2005. Further, NDEP incorrectly conducted its Best Available Retrofit Technology ("BART") analysis which illegally allows an increase in haze forming emissions from BART eligible plants rather than forcing a reduction of haze forming emissions from these sources.

Accordingly, given the significant deficiencies of the RH SIP, the undersigned groups request that NDEP adopt the recommendations found herein and in the attached Technical Report and re-issue the draft RH SIP again for public notice and comment.

Legal Background

The federal Clean Air Act declares the national goal of preventing future visibility impairment, and remedying existing visibility impairment, in Class I areas. 42 U.S.C. § 7491(a). The Clean Air Act mandates that states submit implementation plans designed to meet these national visibility goals. 42 U.S.C. § 7491(b). These implementation plans must contain provisions to reduce visibility impairing emissions within each state, as well as for visibility impairing emissions that may impact other states. 42 U.S.C. § 7491(b)(2); 40 C.F.R. §51.308(d). Before holding a public hearing on a RH SIP, a state must meet in person with the Federal land manager and include a summary of the conclusions and recommendations of the Federal land manager in the notice to the public of the RH SIP. 42 U.S.C. § 7491(d).

The EPA has also promulgated regulations identifying the requirements of an RH SIP. 40 C.F.R. §51.308. The RH SIPs must:

- 1) “provide for an improvement in visibility for the most impaired days...and ensure no degradation in visibility for the least impaired days...” 40 C.F.R. §51.308(d)(1);
- 2) contain a “long term strategy [that] include[s] enforceable emission limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals by States having mandatory Class I Federal areas.” 40 C.F.R. §51.308(d)(3);
- 3) contain evidence that a state with emissions that may impact visibility in a Class I area of another state has consulted with the affected state and set a strategy to achieve compliance with visibility goals. 40 C.F.R. §51.308(d)(3)(i);
- 4) demonstrate that its RH SIP adopts measures to meet its reasonable progress goals for the area. 40 C.F.R. §51.308(d)(3)(ii);
- 5) document the technical basis for the RH SIP, including monitoring data, modeling, and emission information, including the baseline emission inventory upon which its strategies are based. 40 C.F.R. §51.308(d)(3)(iii);
- 6) identify all man-made sources of visibility impairment considered by the state in developing its long term strategy. 40 C.F.R. §51.308(d)(3)(iv).

For the reasons stated below and in the attached Technical Report, Nevada’s RH SIP fails to comply with the legal and regulatory requirements identified above. Accordingly, the undersigned request that Nevada revise its RH SIP consistent with the comments herein and re-issue the revised draft RH SIP for public notice and comment.

Summary of Comments

Below is a summary of comments on the Nevada Draft RH SIP. For a full description of our comments, please refer to the Technical Review, which is attached hereto.

1. The public notice for the RH SIP fails to contain evidence that the State of Nevada has met in person with the Federal land managers for the affected Class I areas as is required by 42 U.S.C. § 7491(d). In addition, the public notice for the Nevada RH SIP fails to contain a summary of the conclusions and recommendations of the Federal land manager as is required by 42 U.S.C. § 7491(d).
2. The RH SIP does not sufficiently allow for known and planned future growth of air emission sources in Nevada and neighboring states, in particular coal-fired electrical generating units (EGUs).
 - Future growth in coal-fired EGUs appears to be underrepresented in the 2018 emission inventory projections contained in the draft Nevada regional haze SIP. If the proposed Ely Energy Center and White Pine Power Projects are included, the 2018 emissions projections appear to be low by about 5,700 tpy for SO₂ emissions and 6,200 tpy for NO_x emissions. NDEP has issued draft PSD permits for both the Ely Energy Center and White Pine power plants. As of early May 2009, the draft PSD permits have not been terminated by NDEP nor have the air permit applications been withdrawn by the applicants. Accordingly, the Ely and White Pine Projects need to be part of Nevada's SIP planning process.
 - There are inconsistencies between the emissions listed in the 2018 emissions inventory for the Nevada regional haze SIP and allowable emissions established by NDEP air quality permits for several sources. For example, the proposed emissions from the TS Power Plant and White Pine Power Project are underestimated in the RH SIP inventory.
 - The proposed Toquop Energy Project near Mesquite is not explicitly listed in the 2018 emissions inventory, but these emissions are relatively close to the emissions assigned to an "unnamed" coal-fired EGU. Although the emissions from the unnamed plant are similar to those of the Toquop Project, the resulting visibility impact projections for 2018 depend also on how the "unnamed" plant was incorporated into the 2018 visibility modeling. Based on the proposed location for Toquop, it is expected that this plant will potentially affect regional haze at Zion National Park, Bryce Canyon National Park, and Grand Canyon National Park. The projections of 2018 visibility at these areas are in error if the future Toquop emissions are not properly represented in the 2108 modeling.
 - The April 2009 Nevada SIP does not include future emissions from the Power County Advanced Energy Center, which was recently issued a

permit by the Idaho Department of Environmental Quality for a site near American Falls, ID. This project could have the potential to impact visibility at the Jarbidge Wilderness.

3. The RH SIP does not contain adequate measures under Best Available Retrofit Technology (BART) for "BART-eligible" emission units under jurisdiction of the NDEP.
 - The proposed SO₂ BART emission rate for Reid Gardner Units 1, 2, and 3 would actually allow for an increase in SO₂ emissions above the baseline. By allowing for an emissions increase, the Nevada SIP is inconsistent with the regulatory intent of BART. It is proposed that Nevada rectify this error by establishing a "two-tiered" BART limit for SO₂ emissions at Reid Gardner. The current proposed BART limit (0.25 lb/MMBtu) could be applied to a short-term (i.e., 1-hour) averaging time, while a more stringent limit (0.10 lb/MMBtu) could be established based on a 30-day rolling average. This would allow for short periods of higher emissions which appear to be present based on historical data, but would also require that the company operate the Reid Gardner SO₂ control systems in a manner consistent with their historical practice. By following the approach recommended above, the annual SO₂ emissions from Reid Gardner would not increase and the BART emissions rate would more closely align with the "presumptive BART" recommended by EPA.
 - The proposed NO_x BART limit for Reid Gardner Unit 3 is higher at 0.28 lb/MMBtu compared to the proposed NO_x limit of 0.20 lb/MMBtu for Units 1 and 2. The draft SIP does not provide an adequate explanation or justification for why Unit 3 requires a higher NO_x emission rate for BART.
 - The SIP explains that selective catalytic reduction (SCR) was evaluated for potential application as BART at Reid Gardner, but rejected based on cost considerations. However, it does not appear that NDEP conducted a critical evaluation of the SCR costs supplied by NV Energy and instead has accepted the company's costs "at face value". If cost is to be used as part of the decision to reject SCR as BART for Reid Gardner, the company's SCR cost estimates need to be properly vetted.
 - The control efficiency used by Nevada in evaluating SCR for Reid Gardner appears to be underestimated. In other situations where SCR was reviewed under BART, the post-SCR NO_x emission rate is consistently 0.07 lb/MMBtu. At Reid Gardner, the proposed post-SCR emissions rate ranged from 0.083 to 0.098 lb/MMBtu. The draft SIP does not explain why 0.07 lb/MMBtu cannot be achieved using SCR at Reid Gardner. If the draft SIP applied a more realistic post-SCR emission rate, the cost evaluation for SCR at Reid Gardner would be more favorable.

- The post-BART modeling for Reid Gardner shows no significant improvement in visibility at nearby Class I areas. The lack of improvement in the post-BART modeling reflects the failure of the draft SIP to craft a BART proposal that contains any meaningful emissions reductions at Reid Gardner, and actually allows for an SO₂ emissions increase. If more appropriate BART emission levels were established at Reid Gardner, it is believed that the post-BART modeling would show visibility improvement at Grand Canyon and other nearby Class I areas.
 - Even after application of BART technologies at Mohave and Reid Gardner, the post-BART visibility modeling continues to show that emissions from Mohave and Reid Gardner would continue to “cause or contribute” to visibility impairment at nearby Class I areas, including Grand Canyon National Park. Nevada should consider more stringent BART emission levels that further reduce or eliminate visibility impairment caused by these sources and even consider emission reductions that are “beyond BART” as have other states where BART has proven to be ineffective at providing the emission reductions needed to achieve “reasonable further progress” toward the national visibility goal.
4. The RH SIP does not adequately address and mitigate Nevada’s contribution to visibility impairment at Class I areas outside of Nevada, in particular National Parks in the southwestern United States that are presently known to be adversely impacted by Nevada emissions (i.e., Zion, Bryce Canyon, and Grand Canyon National Parks).

Regional modeling using the 2018 WRAP inventory projections show that visibility at Grand Canyon, Zion, and Bryce Canyon National Parks will not achieve the Uniform Rate of Progress (URP) goals and that the “glide path” for visibility improvement to natural conditions by 2064 will not be achieved without additional emission reductions. This finding occurs even without considering that future growth from Nevada coal-fired EGUs appears to be significantly underrepresented in the 2018 inventory. As source emissions from within Nevada are shown to “cause and contribute” to visibility impairment at Class I areas outside of the state, Nevada needs to revisit its draft regional haze SIP and craft an emissions reduction plan that helps achieve the URP goals at Class I areas outside of Nevada. Achieving the national visibility goal and meeting the 2018 URP milestones will require aggressive actions from all states in the region, including Nevada. Nevada has established BART emission limits in the draft SIP that fail to provide meaningful improvement in visibility conditions and that continue to show Nevada’s emissions sources will “cause and contribute” to visibility impairment. These findings demonstrate that Nevada’s draft regional haze SIP as written fails to meet its primary objective of providing the initial step toward meeting the national visibility goal.

5. There is an inadequate explanation in the RH SIP regarding why the mining and mine processing sites were not included in the RH SIP inventory. Please either include these sources in the RH inventory or explain why they were excluded.

Thank you for the opportunity to submit comments on Nevada's Draft RH SIP.
Please incorporate the comments herein and in the Technical Review and re-issue a new draft of the RH SIP for public review and comments.

Sincerely,

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Attachment

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U.S. Environmental Protection Agency

National Park Service

Senator Harry Reid

SECTION D.2.2.4.2

TECHNICAL REVIEW BY AIR RESOURCE SPECIALISTS, INC.



**Technical Review of Draft
Nevada State Implementation Plan
For Regional Haze (April 2009)**

Expert Report

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION AND BACKGROUND 1	
1.1 Overview 1	
1.2 Study Methods 1	
1.3 Report Organization 2	
2.0 OVERVIEW OF NEVADA REGIONAL HAZE STATE IMPLEMENTATION PLAN 4	
2.1 Regulatory Setting 4	
2.2 Existing Visibility Conditions at Jarbidge Wilderness 4	
2.3 Emissions Inventory for Visibility Precursor Pollutants in Nevada 5	
2.4 Emissions Inventory for Visibility Precursor Pollutants in Nevada 6	
3.0 PROJECTED GROWTH OF EGUs AND OTHER INDUSTRIAL SOURCES 7	
3.1 Future Coal EGU and Other Industrial Coal-Projects 8	
3.1.1 Toquop Energy Project 8	
3.1.2 Ely Energy Center 8	
3.1.3 White Pine Energy Station 9	
3.1.4 TS Power Plant 10	
3.1.5 Sevier Power (UT) 10	
3.1.6 Intermountain Power Project Unit 3 (UT) 11	
3.1.7 Power County Advanced Energy Center (ID) 11	
3.2 Comparison to Nevada Regional Haze SIP 12	
4.0 BART ANALYSES 15	
4.1 Summary of Proposed BART at Nevada Sources 15	
4.2 Review of Reid Gardner BART Analysis 17	
4.2.1 SO ₂ BART at Reid Gardner 18	
4.2.2 NO _x BART at Reid Gardner 19	
4.3 Visibility Improvements from BART Implementation 21	
4.3.1 Mohave Generation Station 22	
4.3.2 Reid Gardner 23	
4.4 Options for “Beyond-BART” Controls 24	
5.0 CUMULATIVE IMPACTS AT SOUTHWESTERN PARKS 26	
6.0 SUMMARY AND CONCLUSIONS 28	
7.0 REFERENCES 31	
ATTACHMENT 1 Information on Author: D. Howard Gebhart 33	

LIST OF TABLES

<u>Table</u>		<u>Page</u>
2-1	Baseline Visibility Conditions at Jarbidge Wilderness	5
2-2	Nevada Contribution to Sulfate and Nitrate Extinction – Worst Case Days	6
3-1	Proposed 2018 EGUs and Current Permit Activity	7
3-2	Comparison of Permitted SO ₂ & NO _x Emissions to Nevada Regional Haze SIP	13
4-1	Nevada BART-Eligible Sources	15
4-2	Proposed Nevada BART-Emission Reductions: SO ₂ Emissions	16
4-3	Proposed Nevada BART Emission Reductions: NO _x Emissions	17
4-4	Summary of BART-Improvement Modeling Results Mohave Generating Station	22
4-5	Summary of BART-Improvement Modeling Results Reid Gardner Generating Station	23
5-1	Cumulative Impacts on Regional Haze and Utah and Arizona Class I Areas	26

1.0 INTRODUCTION AND BACKGROUND

1.1 OVERVIEW

Air Resource Specialists, Inc. (ARS) has been requested by Western Resource Advocates and the National Parks Conservation Association to conduct a technical review of the Draft regional haze State Implementation Plan (SIP) released for public review and comment by the Nevada Division of Environmental Protection (NDEP), Bureau of Air Quality Planning (dated April 2009). The enclosed report constitutes the requested technical review of the draft Nevada regional haze SIP and supporting documents.

This report focuses on three areas of special concern. The areas of interest are:

- Does the SIP sufficiently allow for known and planned future growth of air emission sources in Nevada and neighboring states, in particular coal-fired electrical generating units (EGUs)?
- Does the SIP contain adequate emission control measures under Best Available Retrofit Technology (BART) for “BART-eligible” emission units under jurisdiction of the NDEP?
- Does the SIP adequately address and mitigate Nevada’s contribution to visibility impairment at Class I areas outside of Nevada, in particular National Parks in the southwestern United States that are presently known to be adversely impacted by Nevada emissions (i.e., Zion, Bryce Canyon, and Grand Canyon National Parks)?

Nevada’s regional haze SIP is somewhat unique compared to most other states. There is only one Class I area in Nevada, which is the Jarbidge Wilderness in the northeastern part of the state. However, due to the relatively isolated location of Jarbidge, large “BART-eligible” emission sources under Nevada’s jurisdiction are located over 300 kilometers (km) away and do not significantly contribute to visibility impairment at Jarbidge. According to the SIP, most of the industrial emissions that contribute to visibility impairment at Jarbidge come from outside the State of Nevada. Existing large emission sources located within Nevada only significantly impact Class I areas outside of the state. Emission sources in northern Nevada (generally in the area of Reno) impact Class I areas in the Sierra Nevada Mountains of northern California. Emission sources in southern Nevada (generally in the area of Las Vegas) impact Class I areas in Utah, Arizona, and southern California.

1.2 STUDY METHODS

This report provides a review and assessment of the Draft regional haze SIP (dated April 2009) which has been prepared by the Nevada Division of Environmental Protection (NDEP). Initially, the SIP was reviewed to obtain general information about regional haze issues in Nevada. Then, a more detailed investigation was conducted on sections of the SIP which were of interest to the topics under consideration, in particular:

- Chapter 3: Sources of Impairment in Nevada
- Chapter 4: Visibility and Source Apportionment Modeling
- Chapter 5: Best Available Retrofit Technology
- Chapter 6: Reasonable Progress for the Jarbidge Wilderness Area
- Chapter 7: Long-Term Strategy for Nevada
- Appendix C: Federal Land Management Agency Comments and Nevada’s Response

The technical review addressed several important items as they related to Nevada’s SIP planning process

- Did Nevada consider all relevant and available information in developing the regional haze SIP?
- Does the SIP summarize and/or explain all of the important and relevant information, including emissions data and modeling data?
- Are the conclusions and plans developed by the SIP supported by the data presented?
- Are there any alternative explanations or conclusions that can be reached based on the data presented in the SIP?
- Are the conclusions and justifications reached in the Nevada regional haze SIP consistent with similar conclusions and justifications applied in other states?
- Does the SIP achieve the overall planning objective of improving visibility conditions by the end of 2018 to the level needed based on the “glide path” toward achieving natural visibility conditions by 2064?

The review presented in this report addresses primarily technical issues as they relate to regional haze in general and Nevada’s regional haze SIP planning process in particular. Less emphasis was placed on the SIP and whether it met the current Environmental Protection Agency (EPA) administrative requirements for the regional haze SIPs. In other words, this report looked beyond the mere content of the technical data provided in the SIP in an attempt to judge the quality and scientific credibility of the information presented.

1.3 REPORT ORGANIZATION

The technical report is organized as follows:

- Chapter 2 provides a summary of the Nevada regional haze SIP, especially with respect to the areas of interest described above.
- Chapter 3 provides information on known proposed or planned coal-fired EGUs and other coal-fired industrial emission units in Nevada and adjacent states.
- Chapter 4 provides a review of the proposed BART for Nevada sources, with emphasis on the Reid Gardner Generating Station in southern Nevada. Reid Gardner emissions have the potential to impact Class I areas outside Nevada, especially Grand Canyon, Zion, and Bryce Canyon National Parks.

- Chapter 5 addresses the cumulative impacts to visibility at Class I areas in Arizona and Utah that are impacted by Nevada emissions and also reviews the level of improvement expected at these areas from BART and other controls recommended by Nevada’s regional haze SIP.
- Chapter 6 discusses the major conclusions and findings of the report.
- Chapter 7 lists the technical references cited by the report.

2.0 OVERVIEW OF NEVADA REGIONAL HAZE STATE IMPLEMENTATION PLAN

This chapter provides an overview of the April 2009 draft Nevada regional haze SIP. This overview is not intended to be a comprehensive summary of all SIP elements, but instead focuses on those components of the SIP which are of most interest with respect to the contents of this report.

2.1 REGULATORY SETTING

The Nevada State Implementation Plan (SIP) for regional haze addresses Clean Air Act requirements to protect visibility in designated Class I areas, mainly national parks and wilderness areas. The 1977 Clean Air Act Amendments call for “prevention of any future and the remedying of any existing impairment of visibility in mandatory Class I Federal areas which impairment results from man-made air pollution” [*Reference 1*]. Nevada has one such Class I area, the Jarbidge Wilderness in northeastern Nevada. The USDA/Forest Service acts as Federal Land Manager (FLM) responsible for the Jarbidge Wilderness.

In response to the Clean Air Act requirements, the United States Environmental Protection Agency (EPA) has adopted requirements aimed at achieving the national goal of restoring visibility to “natural conditions” by 2064. Each state is required to prepare a plan that addresses two elements: 1) improving visibility on the haziest days, and 2) protecting visibility on clear days from being degraded. Plans must also address how emission sources in the state may affect visibility at Class I areas in neighboring states. The second component of the SIP is particularly important in Nevada as many of the major Nevada emission sources impact visibility at Class I areas outside of Nevada.

The current regional haze SIP primarily addresses the initial planning period covering 2008 through 2018. The SIP is required to provide for “reasonable further progress” over the initial planning period toward achieving the national visibility goal. The Nevada SIP establishes this goal as a “uniform rate of progress” (URP), based on achieving a linear rate of visibility improvement from the current conditions to “natural conditions” in 2064.

2.2 EXISTING VISIBILITY CONDITIONS AT JARBIDGE WILDERNESS

Jarbidge Wilderness is located in northeastern Nevada and is relatively isolated from anthropogenic emission sources. As such, Jarbidge has some of the cleanest visibility conditions measured at Class I areas in the continental United States.

Baseline visibility conditions measured at Jarbidge are summarized in Table 2-1. The unit of measurement for visibility is the deciview (dV). The deciview is a sliding scale where a change of 1 dV is intended to represent a level of perceptible change in visibility. Since visual changes tend to be more perceptible in clean environments, a 1 dV change results from lower levels of pollution in a cleaner environment such as Jarbidge. These measurements are collected by the Interagency Monitoring of Protected Visual Environments (IMPROVE) program.

Table 2-1

Baseline Visibility Conditions at Jarbidge Wilderness
(Based on IMPROVE data from 2000-2004
as reported in Nevada’s Draft Regional Haze SIP)

Best 20% Days	Worst 20% Days
2.56 dV	12.07 dV

NDEP’s review of the IMPROVE monitoring data for Jarbidge suggest that organic matter carbon (OMC) and elemental carbon (EC) are the primary contributor to light extinction on the worst 20% days. These pollutants cause almost one-half of the reconstructed extinction on the worst-case days. Sulfates and nitrates, caused generally by anthropogenic emissions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x), represent only 20% of the reconstructed extinction on the worst-case days at Jarbidge. In highly polluted Class I areas, the sulfate and nitrate component of reconstructed extinction is typically very large. On this basis, NDEP concluded that windblown dust and fire emissions are the most significant contributors to existing visibility impairment at Jarbidge. Emissions from industrial sources make only a small contribution to visibility impairment at Jarbidge. According to NDEP, the industrial sources impacting Jarbidge are mostly from Idaho as the large industrial sources in Nevada are generally more than 300 km away.

2.3 EMISSIONS INVENTORY FOR VISIBILITY PRECURSOR POLLUTANTS IN NEVADA

The draft Nevada regional haze SIP has prepared an inventory of pollutants for visibility precursor emissions for the baseline period (2002) and the end of the planning period (2018). The Nevada inventory relies heavily on data prepared by the Western Regional Air Partnership (WRAP) [Reference 2]. For the baseline period, SO₂ and NO_x emissions are dominated by point and area sources (anthropogenic emissions). For the other visibility precursor emissions, natural sources such as fire are the largest contributors, along with fugitive dust for particulate matter emissions.

In the baseline period, Nevada’s industrial emissions are dominated largely by the Mohave Generating Station, a coal-fired electric generating unit (EGU). Operations at Mohave were terminated at the end 2005, so any emission reductions from Mohave have already occurred. If Mohave were to reopen, current regulations would require that the EGU be operated on natural gas.

Major industrial emissions inside and outside of Nevada were also considered when evaluating visibility conditions at Jarbidge. Within Nevada, major emission sources that could affect Jarbidge include the Valmy Station, a coal-fired EGU, along with major gold mines and other mineral operations in the state. All of these emissions appear to be included in the WRAP emissions inventories relied upon by NDEP for the regional haze SIP.

The 2018 inventory prepared by WRAP provides emissions for future growth of industrial emissions sources in Nevada, including planned EGUs. This topic is explored more fully in Chapter 3 of this report.

2.4 IMPACTS OF NEVADA EMISSION SOURCES AT NON-NEVADA CLASS I AREAS

The visibility impact of Nevada emission sources on visibility at Class I areas outside of Nevada has been reported in the draft SIP. These estimates are primarily based upon dispersion modeling. NDEP has relied upon modeling prepared by the Western Regional Air Partnership (WRAP) for this assessment [Reference 3].

For the purposes of this report, we are most interested in how Nevada sources affect visibility at nearby National Parks in the southwest United States, namely Grand Canyon National Park, Zion National Park, and Bryce Canyon National Park. All of these parks generally lie within 300 km of the major point source EGUs in southern Nevada.

The modeling results for sulfate and nitrate extinction at Grand Canyon, Zion, and Bryce Canyon are summarized in Table 2-2.

Table 2-2

Nevada Contribution to Sulfate and Nitrate Extinction – Worst Case Days
(based on WRAP Modeling Presented in Nevada’s Regional Haze SIP)

	Sulfate Extinction		Nitrate Extinction	
	2002	2018	2002	2018
Grand Canyon	6.0%	2.8%	2.2%	2.8%
Zion	9.0%	5.6%	8.1%	7.9%
Bryce Canyon	8.1%	4.8%	8.8%	8.8%

For sulfate extinction, the WRAP modeling shows Nevada sources will be contributing less of the total extinction in 2018 compared to the 2002 baseline condition. Again, the large SO₂ emission reductions associated with the Mohave closure are the likely cause of the decreased sulfate impact. On the other hand, for nitrate extinction, the overall contribution from Nevada emission sources changes only slightly, and actually increases on a percentage basis at Grand Canyon. Even though the percentage attributable to Nevada sources increase, the overall contribution would be expected to decrease due to the projected improvement in the overall nitrate extinction component by 2018.

The contribution of individual Nevada emission sources to visibility is discussed more in the BART section (Chapter 4) and the cumulative modeling section (Chapter 5) of the report.

3.0 PROJECTED GROWTH OF EGUs AND OTHER INDUSTRIAL SOURCES

The April 2009 draft Nevada regional haze SIP includes projections of future growth in industrial emissions as part of the 2018 emissions inventory. Presumably, these emissions were included in the WRAP modeling conducted as part of the SIP to determine whether or not Nevada would achieve “reasonable further progress” as it relates to the national visibility goal. Because emissions and modeling are inherently related, an accurate accounting of future emissions is a very important element of the SIP planning process. If the projected future growth in emissions is underrepresented, the draft SIP may be overestimating the level of improvement of visibility associated with any proposed regulatory actions and Nevada’s ability to achieve “reasonable further progress” could be questioned.

Table 3-1 summarizes the future EGU and other industrial sources listed by Nevada in the April 2009 draft regional haze SIP.

Table 3-1

Proposed 2018 EGUs and Current Permit Activity
(from April 2009 Nevada Draft Regional Haze SIP)

Emissions Unit	NO_x (tpy)	SO₂ (tpy)
Future Coal EGU (Newmont – Northern Nevada Energy)	499	670
Future Natural Gas EGU (Copper Mountain – Sempra Energy)	887	6
Future Natural Gas EGU (Chuck Lenzie – NV Energy)	739	5
Future Coal EGU (White Pine Energy – LS Power)	3,909	4,356
Future Coal EGA (Unnamed – Plant A)	1,340	1,452
Total Growth in Emissions from New EGUs	7,374	6,489

For this report, an independent review was conducted of proposed EGUs in Nevada and adjoining states. This review focused on coal-based EGUs and other coal-based industrial projects. The information presented in this section was obtained from public documents, including newspaper and magazine reports, public documents from companies involved with these projects, and public documents from regulatory agency files, including NDEP. Most of the public documents reviewed for this assessment were obtained via the Internet.

3.1 FUTURE COAL EGU AND OTHER INDUSTRIAL COAL-PROJECTS

3.1.1 Toquop Energy Project

The Toquop Energy Project (Toquop) is a proposed 750 MW coal-fired electric generating plant to be located in Lincoln County, Nevada, about 12 miles northwest of Mesquite. The project developer is Sithe Global Power, under the subsidiary Toquop Energy LLC.

A draft air quality permit for Toquop was released by NDEP in December 2007 and a public hearing on the proposed permit was held February 7, 2008. However, as of May 2009, no final action has been taken by NDEP on the Toquop permit. The Regional Haze SIP needs to be amended to clarify if Plant A is the Toquop plant and also specify the exact location of Plant A by NDEP/WRAP.

Based on NDEP documents [*Reference 4*], Toquop emissions will be 1,614 tons per year (tpy) for nitrogen oxides (NO_x) and 1,352 tpy for sulfur dioxide (SO₂).

Toquop is not specifically listed as an emission source in the 2018 emissions inventory contained in the draft Nevada Regional Haze SIP or the 2018 WRAP inventory. However, the SIP inventory does contain an unnamed generic coal-fired EGU (Plant A) that has emissions approximately equivalent to those listed in the draft Toquop permit.

Toquop is located in southeastern Nevada, in relatively close proximity to the existing Reid Gardner Generating Station, operated by NV Energy. Because of the proximity of the two facilities, it is reasonable to expect that these two facilities would generally impact the same Class I areas (i.e., Zion National Park, Bryce Canyon National Park, and Grand Canyon National Park). As such, the emission increases that would occur from construction and operation of Toquop would tend to offset any benefits generated from BART-related emission reductions at Reid Gardner.

3.1.2 Ely Energy Center

The Ely Energy Center (Ely) is a proposed coal-fired EGU planned for White Pine County, Nevada at a site about 30 miles north of Ely. The project developer is NV Energy, Inc.

A draft air quality permit for Ely was released by NDEP in October 2007 and a public hearing on the draft permit was held on January 9, 2008. However, no final action has been taken by NDEP on the Ely permit.

Based on NDEP documents [*Reference 5*], project emissions at Ely will be 4,853 tpy for NO_x and 4,628 tpy for SO₂.

Ely is not listed in the 2018 emissions inventory contained in the April 2009 draft Nevada Regional Haze SIP, nor is this source listed in the 2018 WRAP emissions inventory projections. In fact, if the Ely emissions were to be included, the total emissions increase assigned to future EGUs in Nevada would be increased by about 65% for NO_x and over 70% for SO₂.

However, on February 9, 2009, NV Energy announced that construction and development of the Ely Energy Center Project has been postponed [*Reference 6*]. In lieu of the Ely Energy Center, NV Energy instead announced that they had acquired a 598 MW natural gas-fired generating station (Higgins Generating Station) and would also pursue construction of a 500 MW natural gas-fired unit at their Harry Allen Generating Station. It is unclear whether or not the additional 500 MW natural gas-fired unit at Harry Allen is represented in the 2018 Nevada emission inventory. The 2018 WRAP emission projections list future natural gas fired units at NV Power's Chuck Lenzie Station, but no mention is made of additional natural gas-fired units at the Harry Allen Station.

As of May 2009, the draft PSD permit and air permit application for the Ely Energy Center have not been withdrawn by NV Energy or terminated by NDEP. As such, these emissions still need to be part of Nevada's SIP planning process.

3.1.3 White Pine Energy Station

The White Pine Energy Station (White Pine) is a proposed coal-fired EGU planned for White Pine County, Nevada at a site near McGill. The project developer is White Pine Energy Associates LLC (LS Power).

A draft air quality permit for Ely was released by NDEP in December 2006 and a public hearing was on the draft permit held on March 8, 2007. However, no final action has been taken by NDEP on the White Pine permit.

Based on NDEP documents [*Reference 7*], project emissions at White Pine will be 4,812 tpy for NO_x and 6,071 tpy for SO₂.

White Pine is part of the 2018 emissions inventory contained in the April 2009 draft Nevada Regional Haze SIP and the 2018 WRAP inventory. However, the SIP and WRAP inventory substantially underestimates White Pine's emissions in comparison to the NDEP draft permit. SO₂ emissions are underestimated in the SIP by about 1,700 tpy (4,356 tpy vs. 6,071 tpy) and NO_x emissions are underestimated by about 900 tpy (3,909 tpy vs. 4,356 tpy).

However, on March 5, 2009, LS Power announced that construction and development of the White Pine Energy Station has been postponed “indefinitely.” [Reference 8]. Furthermore, LS Power withdrew a pending application for the project before the Public Utilities Commission of Nevada and NDEP also cancelled a public hearing scheduled for March 25, 2009 related to the revised Statement of Basis covering White Pine’s carbon dioxide and greenhouse gas emissions.

However, as of May 2009, the draft PSD permit and air permit application for the White Pine Power Project have not been withdrawn by LS Power or terminated by NDEP. As such, these emissions need to continue to be part of Nevada’s SIP planning process.

3.1.4 TS Power Plant

The TS Power Plant (TS Plant) is a 200 MW coal-fired boiler at a site near Dunphy, NV. The project developer is Newmont Nevada Energy Investment LLC (owned by Newmont Mining Corporation). The TS Plant supplies part of its electrical output to operate nearby mining operations owned by Newmont with the remainder of the power output going to the electrical grid.

The TS Plant is currently operational and is covered by a Class I Air Quality Operating Permit (Permit No. AP4911-1349), issued by NDEP.

Based on the allowable emission limitation for the coal boiler [Reference 9], project emissions at TS were calculated by ARS to be 596 tpy for NO_x and 845 tpy for SO₂. The TS Plant operating permit limits annual NO_x emissions, but does not contain an annualized limit for the SO₂ emission. The SO₂ emission total was estimated by ARS using the short-term emissions limit (192.9 lb/hr) and 8,760 hours per year of operation.

The TS Power Plant is part of the 2018 emissions inventory contained in the April 2009 draft Nevada Regional Haze SIP. However, the SIP somewhat underestimates the TS Plant emissions in comparison to the allowable emissions from the Class I permit. SO₂ emissions are underestimated in the SIP by about 175 tpy (670 tpy vs. 845 tpy) and NO_x emissions are underestimated by about 100 tpy (3,909 tpy vs. 4,356 tpy). The correct permitted emissions for this facility should be reflected in the Nevada regional haze SIP.

3.1.5 Sevier Power (UT)

Sevier Power Company LLC (Sevier) has proposed a 250 MW (net) circulating fluidized bed coal-fired power plant in central Utah near Sigurd. [Reference 10]

Sevier was issued a final air quality permit by the Utah Division of Air Quality (UDAQ) in October 2004. However, this permit has been appealed by the Sierra Club Utah Chapter and Sevier Citizens for Clean Air and Water. A hearing on these two permit appeals was held before the Utah Supreme Court on October 8, 2008. As of May 2009, a decision on these appeals has not yet been published by the Court. There is also a legal dispute regarding a local Sevier County

ordinance that would require a public vote to approve any Conditional Use Permit issued for the project.

Sevier is closest to Capitol Reef National Park and other Class I areas in Utah and appears to be more than 300 km from the Jarbidge Wilderness in Nevada. As such, it probably falls outside the distance at which adverse impacts to visibility at Jarbidge could be expected and probably does not need to be considered in Nevada's Regional Haze SIP. However, this project may contribute to the cumulative visibility impacts at Class I areas in southwestern Utah, including Bryce Canyon and Zion National Parks.

3.1.6 Intermountain Power Project Unit 3 (UT)

The Intermountain Power Project (IPP) is owned and operated by the Los Angeles Department of Water and Power (LADWP) and PacifiCorp. IPP has two existing coal-fired EGUs sized at 900 MW each at a site near Delta, UT. A third 900 MW coal-fired EGU has been proposed for this site, which is about 300 km distant from Jarbidge.

A final air quality permit for Unit 3 was issued by UDAQ, but this permit was then appealed by the Sierra Club and Grand Canyon Trust. Then, in 2007, the six California cities that take the majority of IPP's power refused to support construction of a third coal-fired EGU. Also, PacifiCorp formally announced cancellation of Unit 3 in December 2007. However, in January 2008, the Utah Associated Municipal Power System (UAMPS), a group of 23 Utah communities and six electric cooperatives that pledged to purchase 50% of the power generated by Unit 3, sued to force LADWP to proceed with the plan to construct Unit 3.

As of May 2009, the final PSD permit for IPP Unit 3 has not been terminated by UDAQ nor has the air permit application been withdrawn by the proponent. In fact, in April 2008, the Utah Department of Environmental Quality (UDAQ) granted an extension of the IPP Unit 3 air quality permit to October 15, 2009 [*Reference 11*]. The IPP Unit 3 emissions are estimated at 3,183 tpy for both SO₂ and NO_x [*Reference 12*].

Because the IPP Unit 3 permit remains active, these emissions need to be part of Nevada's SIP planning process. However, as IPP Unit 3 is part of the 2018 WRAP inventory, these emissions were already included in Nevada's regional haze SIP.

3.1.7 Power County Advanced Energy Center (ID)

The Power County Advanced Energy Center (PCAEC) is a project to gasify coal and petroleum coke for use in the production of nitrogen fertilizers and elemental sulfur. The project developer is Southeast Idaho Energy LLC (Refined Energy Holdings) and the project site is near American Falls, ID.

Based on information from SourceWatch [*Reference 13*], the original plans for this project included a 520 MW Integrated Gasification Combined Cycle (IGCC) power plant. The original air quality permit filed by PCAEC in 2007 included on-site power generation, albeit at a

significantly smaller size (60-70 MW). However, these plans were later withdrawn in 2008 when PCAEC filed a revised air permit application.

PCAEAC was issued an air quality permit by the Idaho Department of Environmental Quality (IDEQ) on February 10, 2009 (Permit P-2008.0066). Following issuance of the permit, a Petition for Contested Case Proceeding was filed by Sierra Club, Idaho Conservation League, and the Shoshone-Bannock Tribe with the Board of Environmental Quality. This permit appeal is still pending.

The allowable PCAEC emissions listed in the IDEQ permit are small, 109 tpy for NO_x and only 23 tpy for SO₂ [*Reference 14*]. However, based on an initial review of this permit, it appears that these emissions may have been underestimated (a detailed review of the PCAEC permit documents is beyond the scope of the assigned work for the Nevada Regional Haze SIP review).

For example, the PCAEC permit does not appear to address emissions that might occur from start-up, shutdown, and/or malfunction flaring at the gasifier unit. Typically, coal gasification system output needs to be routed to a flare during these operating events. If untreated gas were be routed to the flare under these circumstances, overall SO₂ emissions could increase substantially.

However, more significantly, the emissions data used by IDEQ in the permit appear to be internally inconsistent with respect to the sulfur emissions. Using the IDEQ *Statement of Basis* (Page 12), the gasifier capacity is up to 5,000 tons per day (tpd) of input coal/pet coke blend at a maximum sulfur content of 6%. This would equate to sulfur inputs to the gasifier system of 300 tons per day (tpd), or 109,500 tons per year (based on 365 days per year). Since two pounds of SO₂ are created for each pound of sulfur, the potential uncontrolled SO₂ emissions associated with the gasifier would then be 219,000 tpy. Yet, the allowable SO₂ emissions in the PCAEC permit only total 23 tpy. In order to achieve the allowable SO₂ emissions, the level of sulfur control for the gasifier process needs to be about 99.99%. This level of sulfur control seems very high for the process equipment listed in the permit (sour water scrubber and Claus sulfur recovery unit). Also, because IDEQ has determined that: 1) the sulfur removal equipment is integral to the process and should not be regulated as pollution control equipment, and 2) the sulfur standards contained in the certain New Source Performance Standards (NSPS) are not applicable to the unit, there are minimal enforceable standards in the permit to require that the plant equipment actually achieves these high sulfur control levels.

Overall, the ability of PCAEC to actually achieve the low SO₂ emissions allowed by the permit is suspect. However, whether SO₂ emissions at PCAEC could potentially increase to levels which would cause visibility impairment at Jarbidge cannot be determined at present.

3.2 COMPARISON TO NEVADA REGIONAL HAZE SIP

This section summarizes the 2018 regional emissions described above in relation to the projections contained in Nevada's draft regional haze SIP. In developing these data, emissions from the following projects were included in this analysis based on the developer's current intent

to proceed with project construction and development and/or the fact that final air quality permits have been issued by the regulatory agency:

- Toquop Energy
- TS Power Plant
- Power County Advanced Energy Center

In the case of the Ely Energy Center and White Pine Power Project, the project developers have recently announced that these projects will not proceed in the immediate future. However, no action has been taken (as of early May 2009) to formally withdraw the air permit applications for these projects or terminate the draft PSD permits issued for these facilities. As long as the permit applications are still active at NDEP, these projects need to be part of Nevada’s regional haze SIP planning efforts. Due to this regulatory uncertainty, the results in this section are listed both with and without Ely and White Pine emissions.

For Sevier Power, the project appears to be proceeding forward pending resolution of the air quality permit appeal currently before the Utah Supreme Court. However, Sevier Power appears to be too far removed from Jarbidge to be realistically considered as a potential contributing emission source. Sevier Power emissions may impact Class I areas within Utah, but visibility impacts within Utah falls outside the scope of Nevada’s Regional Haze SIP.

For IPP Unit 3, the PSD permit for this project has been extended until October 15, 2009. However, as the IPP Unit 3 emissions are part of the WRAP 2018 emission projections, they appear to have been considered by NDEP in their regional haze SIP. Therefore, Nevada’s regional haze SIP should acknowledge that IPP’s emissions have been included in order to prevent any confusion over the issue.

Table 3-2 summarizes the future projects considered in Nevada’s SIP and compares the projected 2018 emissions to allowable permit levels. In Table 3-2, the natural gas fired EGUs listed in the April 2009 draft SIP have not been considered.

Table 3-2

Comparison of Permitted SO₂ & NO_x Emissions to Nevada Regional Haze SIP
(Based on Future Coal EGUs within Nevada or that may affect Jarbidge)

Project	SO ₂ Emissions (tpy)		NO _x Emissions (tpy)	
	Permit	NV SIP	Permit	NV SIP
Toquop Energy	1,352	0	1,614	0
TS Power Plant	845	670	596	499
Power County Advanced Energy Center	23	0	109	0

Ely Energy Center	4,628	0	4,853	0
White Pine Power Project	6,071	4,356	4,812	3,909
IPP Unit 3	3,183	3,183	3,183	3,183
Unnamed Coal EGU	0	1,452	0	1,340
Totals	15,402	9,661	15,167	8,931
Totals (without Ely & White Pine)	5,403	5,305	5,502	5,022

If the Ely and White Pine Projects are included, the data show that the SIP has significantly underestimated future SO₂ and NO_x emissions associated with future coal-based EGU development in Nevada. The Nevada SIP has underestimated these emissions by roughly 5,700 tons SO₂ and 6,200 tons NO_x.

If Ely and White Pine are excluded, the Nevada SIP still underestimates future EGU emissions, although the error is smaller (about 100 tpy for SO₂ and about 500 tpy for NO_x). However, any modeling projections reported in the SIP could still be significantly affected by these differences. As noted in Table 3-2, the Toquop Energy Project may more or less be represented (from an emissions basis) by the “unnamed coal EGU” project in the April 2009 draft Nevada regional haze SIP. However, the location of the “unnamed coal EGU” does not match the Toquop plant. As such, this plant does not have similar Class I visibility impacts to Toquop. Due to its location, Toquop would be expected to have its greatest impact at Class I areas in southwestern Utah, namely Zion and Bryce Canyon and also at Grand Canyon. Based on the WRAP 2018 emissions information [*Reference 15*], the unnamed Nevada coal-fired EGU was modeled at a site close to the proposed White Pine Project. However, even if the magnitude of the Toquop emissions is accurately reproduced in the 2018 inventory, errors have likely been introduced in the modeling of future 2018 emissions at Zion and Bryce Canyon (and perhaps even other Class I areas).

4.0 BART ANALYSES

The Nevada Division of Environmental Protection (NDEP) has identified five EGUs within Nevada that are “BART-eligible.” Table 4-1 summarizes these facilities.

Table 4-1

Nevada BART-Eligible Sources

Owner	Facility	Unit	Size	Location	Operational Date
NV Energy	Tracy	Unit 1	55 MW	Mustang, NV	1963
		Unit 2	83 MW		1965
		Unit 3	113 MW		1974
NV Energy	Fort Churchill	Unit 1	113 MW	Yerington, NV	1968
		Unit 2	113 MW		1971
NV Energy	Reid Gardner	Unit 1	100 MW	Moapa, NV	1965
		Unit 2	100 MW		1968
		Unit 3	100 MW		1976
NV Energy	Sunrise	Unit 1	Not Specified	Las Vegas, NV	1964
Southern Cal Edison	Mohave	Unit 1	790 MW	Laughlin, NV	1969
		Unit 2	790 MW		1969

Of the above facilities, only Reid Gardner is presently coal-fired. Tracy, Fort Churchill, and Sunrise are all natural gas-fired. The Mohave Station was formerly a coal-fired EGU, but ceased operations at the end of 2005. If Mohave reopens, it would be as a natural gas-fired facility.

The Valmy Station is not a “BART-Eligible” EGU as its date of operation falls outside of the BART time window.

All of the BART-eligible sources in Nevada are more than 300 km from the Jarbidge Wilderness, which is Nevada’s only Class I PSD area. Thus, the BART controls for Nevada sources are intended to provide visibility improvements at Class I areas outside of Nevada.

4.1 SUMMARY OF PROPOSED BART AT NEVADA SOURCES

Tables 4-2 and 4-3 summarize the emission reductions expected to be generated for SO₂ and NO_x emissions respectively by implementation of the proposed Nevada BART decisions. In these tables, the “baseline” emission estimates were developed by NDEP from acid rain monitoring data for each unit (generally over the period 2002 through 2007). The “baseline” emissions are reported by NDEP to represent the average emissions over the peak 2-year period at each unit for which monitoring data were available. The draft SIP goes on to state that these estimates are generally lower than the WRAP “baseline” emissions, which were estimated based on the peak-24 hour emissions over the 2001-2003 period.

Table 4-2

Proposed Nevada BART-Emission Reductions: SO₂ Emissions

Facility	Unit	Size	Baseline Emissions (tpy)	BART Emissions (tpy)	Emissions Reduction (tpy)
Tracy	Unit 1	55 MW	1	34	-33
	Unit 2	83 MW	2	73	-71
	Unit 3	113 MW	82	146	-64
Fort Churchill	Unit 1	113 MW	8	147	-139
	Unit 2	113 MW	11	147	-136
Reid Gardner	Unit 1	100 MW	621	1,144	-523
	Unit 2	100 MW	398	1,251	-853
	Unit 3	100 MW	422	1,233	-811
Mohave	Unit1	790 MW	21,507	45	21,462
	Unit 2	790 MW	21,083	45	21,038
Totals			44,135	4,265	39,870
Net Change w/o Mohave					-2,630

Table 4-3

Proposed Nevada BART Emission Reductions: NO_x Emissions

Facility	Unit	Size	Baseline Emissions (tpy)	BART Emissions (tpy)	Emissions Reduction (tpy)
Tracy	Unit 1	55 MW	221	130	91
	Unit 2	83 MW	321	156	165
	Unit 3	113 MW	795	498	297
Fort Churchill	Unit 1	113 MW	1,209	524	685
	Unit 2	113 MW	862	403	459
Reid Gardner	Unit 1	100 MW	2,267	959	1,308
	Unit 2	100 MW	2,445	1,002	1,443
	Unit 3	100 MW	2,268	1,399	869
Mohave	Unit1	790 MW	10,761	2,347	8,414
	Unit 2	790 MW	10,068	2,347	7,721
Totals			31,217	9,765	21,452
Net change w/o Mohave					5,317

The net change in emissions attributable to the proposed Nevada BART controls is dominated by the situation at Mohave. Since Mohave ceased operations in 2005, the Mohave emissions reductions reported in Tables 4-2 and 4-3 have already occurred. In order to assess the expected change in emissions compared to the current situation, one needs to look at the “net change without Mohave” results, also shown in Tables 4-2 and 4-3. When Mohave is excluded from the evaluation, it is seen that the emission reductions are much less substantial and in the case of SO₂ emissions, Nevada’s proposed BART emission controls actually lead to increases in emissions compared to the baseline condition.

4.2 REVIEW OF REID GARDNER BART ANALYSIS

In this study, special attention was paid to the BART analysis prepared by NDEP for the Reid Gardner Station. Reid Gardner is the only “BART-eligible” Nevada EGU that remains a coal-fired facility in the post-BART operating scenario. Reid Gardner is also generally upwind of Class I areas in Utah and Arizona, such as Zion National Park, Bryce Canyon National Park, and Grand Canyon National Park and would be expected to impact these Class I areas.

The Reid Gardner Station was originally constructed in 1965 (Unit 1). Unit 2 was added in 1968, Unit 3 in 1976, and Unit 4 in 1983. Units 1-3 are all sized at 100 MW each, while Unit 4 is sized at 265 MW. Unit 4 was not subject to BART review as its construction/operational date (1983) falls outside the BART time window. EGUs must have been in existence prior to August 7, 1977, but not prior to August 7, 1962 in order to be “BART-eligible.”

Based on information available from NDEP [*Reference 16*], the Reid Gardner BART review followed the five-step process outlined in the Environmental Protection Agency (EPA) BART guidelines [*Reference 17*]. The BART decision for Reid Gardner is summarized and reviewed below.

4.2.1 SO₂ BART at Reid Gardner

Current SO₂ control at Reid Gardner Units 1, 2, and 3 consists of a soda ash scrubber. For BART, NDEP evaluated additional emission controls to replace and/or upgrade the current SO₂ emission controls, specifically:

- Dry flue gas desulfurization (FGD)
- Dry sorbent injection
- Furnace sorbent injection
- New wet FGD system (replace current wet FGD system)
- Improve and/or upgrade existing wet FGD system

In the federal BART guidelines, EPA recommended a “presumptive BART” level of 0.10 to 0.15 lb/MMBtu or 95% control for SO₂ emissions [*Reference 17*]. However, the “presumptive BART” applies only to EGUs sized 250 MW and larger, so technically the “presumptive BART” recommendation would not apply to any of the Reid Gardner units due to their size (100 MW vs. the “presumptive BART” threshold of 250 MW). NDEP has proposed in the draft regional haze

SIP that the current wet FGD system (wet soda ash scrubber) represents BART for Units 1, 2, and 3. However, the BART SO₂ emissions limit in the draft SIP was set at 0.25 lb/MMBtu. Nevada's proposed BART SO₂ emissions limit at Reid Gardner is approximately twice the "presumptive BART" level recommended by EPA for SO₂ emissions at coal-fired EGUs.

NDEP's BART report for Reid Gardner suggests that the proposed SO₂ emissions limit of 0.25 lb/MMBtu was selected based on the 98th percentile emissions value from the valid continuous emissions monitoring data. In other words, the Reid Gardner historical emissions are at or below 0.25 lb/MMBtu about 98 percent of the time. In this manner, NDEP has proposed a BART limit such that Reid Gardner would comply nearly all of the time based on historical emissions monitoring data. At the proposed emission limits in the regional haze SIP, Nevada's proposed BART would not lead to Reid Gardner employing the "best available retrofit technology" for SO₂ as required by the Clean Air Act.

In fact, by establishing the BART SO₂ limit in this manner, the result is that the April 2009 draft Regional Haze SIP would allow for a substantial increase in SO₂ emissions from each Reid Gardner EGU. As proposed, the draft Nevada visibility SIP would allow each Reid Gardner unit to emit continuously at their peak emissions rate based on historical data. Using NDEP's data presented in the SIP, SO₂ emissions from all three units combined could increase by almost 2,200 tpy, which represents an increase of 2.5 times over the "baseline." This would exceed the projected "new" emissions associated with the Toquop Power Plant.

Also, based on WRAP's emission projections [*Reference 18*], Reid Gardner already achieves SO₂ emissions in the range of 0.03 to 0.04 lb/MMBtu. WRAP's 2018 emission inventory projections also appear to utilize SO₂ emission values in this range at Reid Gardner. Since Reid Gardner has already demonstrated the ability to achieve average SO₂ emissions in the range of 0.03 to 0.04 lb/MMBtu, this emissions range establishes a more appropriate SO₂ BART limit for Reid Gardner.

Fortunately, there is a relatively easy fix which still retains what appears to be Nevada's intent in establishing the proposed Reid Gardner SO₂ BART limit. NDEP could instead set a "two-tiered" SO₂ emissions limit under BART that would allow for peak short-term SO₂ emissions consistent with the historical data, yet also set a lower limit averaged over a longer time period that would more closely align with the historical SO₂ emission levels and require Reid Gardner to maintain the high-level of performance already demonstrated at its pollution control systems. For example, an SO₂ limit set at 0.04 lb/MMBtu (30-day rolling average), would yield an annual emissions total roughly equivalent to the WRAP emissions estimate, yet would still allow occasional short-term periods for higher SO₂ emissions. This approach would be a more prudent way under BART to set limits that provide for variability in short-term emissions, yet require that Reid Gardner maintain emissions control at or near the current levels so as not to degrade further visibility at downwind Class I areas.

In the end, allowing a substantial increase in SO₂ emissions above the baseline level goes against the regulatory intent of the BART program. BART is intended to provide for emission reductions and should not be used as a mechanism to permit substantial increases in emissions at a facility. There is no valid reason why SO₂ control at Reid Gardner under BART should not at

the very least match the performance levels historically achieved at this facility. When viewed in that context, a long-term (30-day rolling average) SO₂ BART limit should be set for Reid Gardner at or below 0.04 lb/MMBtu.

4.2.2 NO_x BART at Reid Gardner

Current nitrogen oxides (NO_x) emission controls at Reid Gardner Units 1-3 consist of low- NO_x burners with over-fire air (OFA). For potential application as BART, Nevada evaluated the following NO_x emission control options:

- Low- NO_x burners (LNB) with overfire air (current configuration)
- LNB with Selective Non-Catalytic Reduction (SNCR)
- Rotating Opposed Fire Air (ROFA) with Rotomix
- LNB with Selective Catalytic Reduction (SCR)
- ROFA with Selective Catalytic Reduction (SCR)

In the EPA guidelines, the “presumptive BART” NO_x emissions level for a coal-fired boiler depends on the boiler configuration and fuel. Reid Gardner Units 1-3 are wall-fired boilers using mostly bituminous coal. Under “presumptive BART”, the recommended NO_x limit is 0.39 lb/MMBtu [*Reference 17*]. Again, Reid Gardner Units 1-3 technically do not fall under “presumptive BART” because the unit size (100 MW) is below the 250 MW threshold used to trigger “presumptive BART.”

NDEP’s BART evaluation for Reid Gardner has derived a BART emissions limit of 0.20 lb/MMBtu for Units 1 and 2 and 0.28 lb/MMBtu for Unit 3. The need for a higher BART NO_x limit at Unit 3 is not discussed in NDEP’s summary BART report. NDEP should provide clear evidence as to why Unit 3 is unique and cannot achieve the same NO_x BART limit as Units 1 and 2. Without this information, the need for a higher NO_x BART limit at Unit 3 cannot be confirmed by ARS or any other member of the public. The proposed BART emissions limit is based on installation of ROFA with Rotomix as the preferred technology.

Lower NO_x emissions could be achieved using one of the SCR technology alternatives. If SCR were employed along with ROFA with Rotomix, the NO_x emissions could decrease to a range of 0.083 to 0.098 lb/MMBtu using NDEP data (the exact emissions level depends on the Unit). This would represent an additional 60-65% reduction in NO_x from Reid Gardner Units 1-3. Based on the NDEP evaluation, cost was the primary factor in not selecting one of the SCR options as BART. Cost is an allowable consideration under EPA’s BART guidelines.

When SCR is added to ROFA with Rotomix, the capital costs increase from about \$8 million to roughly \$38.5 million for each unit (over \$90 million for SCR at all three units). The emissions control cost-effectiveness with SCR increases by about a factor of two or three, from around \$1,000 per ton to an average of about \$2,800 per ton at Units 1 and 2 and from about \$1,600 per ton to about \$3,000 per ton at Unit 3. Although NDEP has rejected these costs as too expensive, it should be noted that NO_x BART determinations in North Dakota determined that costs in the \$3,000 to \$4,000 per ton range were acceptable [*Reference 19*]. On an incremental

basis compared to ROFA with Rotomix, the SCR costs for Reid Gardner are reported to be around \$7,000 per ton at Units 1 and 2 and \$4,500 per ton at Unit 3. The above cost numbers were developed by NV Energy and used by NDEP to evaluate the BART costs.

Because cost was the primary parameter used by NDEP to exclude the SCR technologies as BART for Reid Gardner, it is important that the cost information used to support this decision is accurate. Based on the SIP, NDEP has chosen to use the SCR cost information provided by NV Energy, but there is no evidence that NDEP critically reviewed the company's SCR cost information. Since regulated companies know that cost information is part of the BART review process, these companies have a vested interest in trying to present maximum or "worst-case" costs for a particular control technology. An independent review of NV Energy's cost information is essential if NDEP is to rely on cost data to exclude SCR as BART.

In the Oregon regional haze SIP, the Oregon Department of Environmental Quality (ODEQ) did conduct an independent evaluation of the company-provided costs for SCR at the Boardman Power Plant [*Reference 20*]. The Oregon DEQ concluded that capital costs for the SCR alternative at Boardman were overestimated by the company by 27%.

An independent evaluation of the Nevada regional haze SIP conducted by the National Park Service also found that the reported SCR costs for Reid Gardner were likely overstated [*Reference 21*]. NPS estimated costs were about 33% lower than those developed by NV Energy. NPS concluded that a lower cost would result in cost-effectiveness values that suggest that SCR is viable as BART from an economic standpoint. Coupled with the Boardman information presented above, this shows the need for a critical evaluation of the SCR cost information submitted by NV Energy.

The cost information should also be coupled with the NO_x emission levels assumed for SCR. In the April 2009 draft Nevada regional haze SIP, the resulting SCR NO_x emissions are higher than what would normally be assigned to this technology. At newer coal-fired units for which Nevada has issued draft permits (i.e., Toquop Energy Project), NO_x control using SCR achieves emissions as low as 0.06 lb/MMBtu [*Reference 4*]. While it is recognized that control technologies when applied in a retrofit situation may not be as effective, the proposed BART limits at Reid Gardner are more than 60% higher than when the same pollution technology is applied at new emission units.

In the Oregon regional haze SIP, SCR controls have been proposed for the Boardman Power Plant (a coal-fired EGU) as "beyond BART" emission controls (See Section 4.4). At Boardman, the SCR control efficiency is about 70%, reducing NO_x emissions to 0.07 lb/MMBtu from a "pre-SCR" level of 0.23 lb/MMBtu [*Reference 20*]. This "pre-SCR" NO_x emission rate is higher than the "pre-SCR" rate at Reid Gardner for Units 1 and 2, yet the draft Nevada SIP is based on higher "post-SCR" NO_x emissions. The April 2009 draft Nevada SIP only presumes that SCR control achieves a control efficiency in the range of 60-65% at Reid Gardner, compared to 70% elsewhere. If 70% control for SCR were used, the resulting NO_x emission rate at Reid Gardner Units 1 and 2 would be less than 0.06 lb/MMBtu and would be 0.083 lb/MMBtu at Unit 3. In fact, the BART analysis for Reid Gardner submitted by NV Energy also used a "post-SCR" emission rate of 0.07 lb/MMBtu [*Reference 22*].

Also, in New Mexico, SCR is being considered for implementation as BART for the San Juan Power Plant at a NO_x emissions level of 0.07 lb/MMBtu [*Reference 19*]. The reported SCR cost factor at San Juan is \$6,500 per ton NO_x removed. Presumably, the higher cost of NO_x control at San Juan is justified by the significant visibility improvement that would occur from implementation of this technology (estimated at up to 1.3 dV). The SCR costs reported for Reid Gardner and rejected by NDEP as too expensive are less than 50% of the costs being considered by New Mexico for implementation of SCR at San Juan.

In summary, Nevada's regional haze SIP needs to use a more realistic NO_x control efficiency for SCR or explain why the same NO_x emissions control achieved elsewhere cannot be achieved using SCR at Reid Gardner. If a lower NO_x emission level were achievable, the economic cost effectiveness of SCR would also improve. Also, because NDEP did not critically review the company-submitted SCR cost information and other indications are that costs submitted by regulated companies are sometimes inflated, the conclusions of the Nevada SIP regarding the cost-effectiveness of SCR at Reid Gardner are deemed to be unreliable. Finally, if a more realistic NO_x emissions level were used to represent SCR at Reid Gardner, the NO_x reductions would be higher and the cost-effectiveness of SCR would improve.

4.3 VISIBILITY IMPROVEMENTS FROM BART IMPLEMENTATION

The April 2009 draft regional haze SIP includes information on the expected improvement in visibility conditions resulting from the proposed BART technologies and emission rates. Information related to the modeled BART improvements is provided for Mohave and Reid Gardner, as these emission sources impact the Class I areas of greatest interest with respect to the issues in this report.

Details on the specifics of how the BART-improvement modeling was prepared by NDEP are not contained within the draft SIP documentation.

4.3.1 Mohave Generation Station

Table 4-4 summarizes the results from the Mohave Generating Station BART-improvement modeling. BART for Mohave was the elimination of coal-fired electric generation and operation of natural gas. Mohave's modeling results are presented for the plant as a whole rather than for individual units. Although part of the "baseline" SIP emissions, Mohave is not currently operating. As such, any visibility benefit associated with emission reductions at Mohave has already been achieved.

Table 4-4 shows that the BART controls at Mohave should have a strong positive benefit at improving visibility at nearby Class I areas. Despite a strong positive benefit, even after implementation of BART controls, the Mohave plant remains above the "cause and contribute" visibility thresholds at Grand Canyon and Joshua Tree (98th percentile extinction at or above 0.5 dV). These results suggest that additional emission reductions are likely needed at Mohave in order to reach the national visibility goal.

Table 4-4

Summary of BART-Improvement Modeling Results
Mohave Generating Station

Class I Area	Dist. (km)	Baseline Condition		Post-BART Condition	
		98 th % dV	Days > 0.5 dV	98 th % dV	Days > 0.5 dV
Grand Canyon	110	2.91	194	0.53	8
Joshua Tree	137	3.96	90	0.76	14
Zion	262	1.45	80	0.20	0
Sycamore Canyon	223	1.38	29	0.12	0
Agua Tibia	286	1.11	19	0.10	0
Cucamonga	287	1.05	20	0.11	0
San Gorgonio	225	1.50	27	0.14	1
San Jacinto	234	1.46	29	0.15	1
Mazatal	279	0.98	25	0.04	0
Pine Mountain	265	0.98	23	0.04	0
Dome Land	268	1.34	26	0.10	0

4.3.2 Reid Gardner

Table 4-5 summarizes the Reid Gardner BART-improvement modeling results. The proposed BART at Reid Gardner provides for NO_x control through installation of ROFA with Rotomix on each unit. Also, even though the proposed BART used the in-place SO₂ emissions control technology at Reid Gardner, the proposed SIP emission rate actually allows for SO₂ emission increases compared to the baseline condition. The Reid Gardner modeling results are presented in the draft SIP for individual units.

Although Nevada has proposed NO_x BART emission rates for Reid Gardner, it is unclear to what extent these controls are actually reflected in the WRAP 2108 emissions inventory used to drive the model calculations summarized above. Based on the most recent WRAP emissions update [*Reference 18*], the planned emission changes due to BART at Reid Gardner do not appear to be reflected in the WRAP 2018 modeled inventory. This makes the results of the Reid Gardner post-BART modeling suspect. The draft SIP should clearly identify the baseline and post-BART emissions used to generate the Reid Gardner modeling results.

Table 4-5

Summary of BART-Improvement Modeling Results
Reid Gardner Generating Station

Class I Area	Dist. (km)	Unit	Baseline Condition		Post-BART Condition	
			98 th % dV	Days > 0.5 dV	98 th % dV	Days > 0.5 dV
Grand Canyon	86	1	0.85	19	0.83	19
		2	0.86	21	0.73	15
		3	0.79	17	0.73	18
Joshua Tree	292	1	0.32	3	0.33	4
		2	0.32	3	0.32	3
		3	0.33	3	0.34	4
Zion	148	1	0.22	3	0.22	2
		2	0.22	3	0.19	2
		3	0.22	3	0.20	2
Bryce Canyon	227	1	0.13	0	0.12	0
		2	0.13	0	0.12	0
		3	0.13	0	0.13	0
Sycamore Canyon	289	1	0.06	0	0.06	0
		2	0.06	0	0.06	0
		3	0.07	0	0.07	0

At Reid Gardner, if the modeling results are to be believed, the implementation of BART controls is shown to have only minimal effect at reducing visibility impacts. In fact, in a few cases, the proposed BART emission controls at Reid Gardner emissions is actually shown to degrade visibility marginally (i.e., see Unit 3 at Grand Canyon and Joshua Tree). The lack of change in the Reid Gardner modeling results appears to reinforce the above suspicion that the post-BART emissions are not properly reflected in the 2018 model emissions inventory. If the modeled inventory does not accurately reflect the post-BART emissions at Reid Gardner, the modeling results reported in the SIP are in error and Nevada has failed to provide one of the administrative requirements of its regional haze SIP (documentation of the changes in visibility attributable to the proposed BART emission controls).

Also of interest is that the “post-BART” impact of Reid Gardner would still be at or above the “cause or contribute” threshold under the federal visibility rules at Grand Canyon (98th percentile extinction at or above 0.5 dV). Assuming the modeling results are accurate (which may not be the case based on the above analysis), the Reid Gardner model results would clearly demonstrate the need for a more stringent BART determination. Nevada should select

BART technologies and associated emission limits that significantly reduce the impact of Reid Gardner’s emissions on visibility degradation at the Grand Canyon and other Class I areas and properly document the actual effect of these changes on visibility. The modeling results summarized in Nevada’s draft regional haze SIP suggest that the proposed BART emission limits at Reid Gardner fail to provide any significant visibility improvement at Class I areas outside Nevada.

On a unit-by-unit basis, the 98th percentile extinction from Reid Gardner is less than 0.5 dV at Zion and Bryce Canyon. As such, the individual units do not “cause or contribute” to visibility impairment at either Zion or Bryce Canyon, even under the baseline condition. However, the modeling results as presented in the draft SIP do not allow for a determination of the cumulative impact from Reid Gardner Units 1, 2, and 3.

One final note of interest with respect to the modeling results is that the reported visibility impacts from Reid Gardner at Joshua Tree (292 km away) are significantly greater than impacts to other Class I areas that are closer to the facility (with the exception of Grand Canyon). The information provided in the draft SIP did not discuss this finding and why it might have occurred.

4.4 OPTIONS FOR “BEYOND-BART” CONTROLS

Regional haze SIPs in other states have investigated and sometimes recommended additional emission controls that are “beyond BART” which are justified as part of the goal to achieve “reasonable further progress” toward the national visibility goal. Two such examples are summarized in this section.

In Oregon, the Boardman Power Plant BART analysis concluded that low- NO_x burners with modified overfire air satisfied the current BART requirements and proposed an allowable NO_x emissions level of 0.23 lb/MMBtu. Although SCR was not recommended for immediate implementation under BART, Oregon has proposed to require installation of SCR at Boardman no later than July 1, 2017 [*Reference 20*]. Oregon has proposed additional NO_x emission controls that are “beyond BART” at Boardman in order to maintain the “reasonable further progress” goals of Oregon’s visibility program. The post-SCR NO_x emissions level at Boardman will be 0.07 lb/MMBtu.

The State of Kansas has also elected to impose “beyond BART” emission controls as part of its proposed regional haze SIP [*Reference 23*]. In Kansas, there are no existing federal Class I areas, so Kansas has adopted its program in order to assist neighboring states achieve their “reasonable further progress” goals. Kansas also implemented its program even though the light extinction from Kansas sources was no greater than 5% of the total extinction on worst-case days at any of the neighboring Class I areas. As described previously, Nevada sources are projected in 2018 to contribute up to 9% of the nitrate extinction at Class I areas in neighboring states.

In Kansas, the “beyond BART” review focused on sources that were not “BART-eligible.” The evaluation reviewed the costs of controls and also the potential visibility benefits

of implementing these controls. Of approximately 25 Kansas emission units not regulated under BART, additional emission controls were proposed for 10 emission units at six facilities where the cost was deemed to be reasonable (at or below \$15,000 dollars per ton per deciview of improvement).

The “beyond BART” approach could be applied in Nevada to secure additional emission reductions at Nevada emission sources, which would in turn aid neighboring states achieve their “reasonable further progress” goals. Candidates for “beyond BART” would include the implementation of SCR at Reid Gardner Units 1-3 and investigation of improved emission controls at Reid Gardner Unit 4. NDEP needs to ensure that emission controls at its sources are sufficient to ensure that Nevada sources contribute their fair share to improving visibility conditions at Class I areas in neighboring states. In the draft SIP, Nevada has relied upon emission reductions already achieved at Mohave without developing appropriate emission control strategies that would provide meaningful visibility improvement from any other sources.

5.0 CUMULATIVE VISIBILITY IMPACTS AT SOUTHWESTERN PARKS

One of the items requested by WRA and NPCA was a review of the potential cumulative visibility impacts attributable to multiple emission sources that occurs at National Parks in the southwestern United States, in particular Zion National Park.

The cumulative effect of emission sources at Zion and other southwestern Class I areas (Grand Canyon, Sycamore Canyon, and Bryce Canyon) is covered in only summary fashion within the April 2009 draft regional haze SIP. Since these Class I areas are located outside of Nevada, the NDEP does not have primary responsibility for developing the visibility plan for these areas. However, Nevada sources do contribute in part to the visibility impairment at each of these areas and Nevada is responsible for addressing in the SIP how their sources impact the overall visibility planning efforts at these Class I areas. Future development of coal-fired EGUs in Nevada, especially the proposed Toquop Power Project (See Section 3.1.1 of this report), may also contribute to visibility impairment at Class I areas outside of Nevada.

Data from the Nevada regional haze SIP on cumulative effects at Class I areas outside of Nevada are summarized in Table 5-1. These data show the current baseline extinction, the target 2018 extinction based on the Uniform Rate of Progress (URP) necessary to achieve the national visibility goal by 2064, and the projected extinction using modeling projections based on the 2018 emissions inventory from WRAP.

Table 5-1

Cumulative Impacts on Regional Haze and Utah and Arizona Class I Areas

Class I Area	Baseline Extinction dV	2018 URP Target dV	Projected 2108 Extinction dV
Grand Canyon (AZ)	11.66	10.58	11.10
Sycamore Canyon (AZ)	15.25	13.25	15.08
Zion (UT)	13.24	11.78	12.76
Bryce Canyon (UT)	11.65	10.52	11.22

For each of the Class I areas of interest, the projections of visibility impairment based on the 2018 WRAP emissions inventory fail to achieve the URP target goals, which means that the “glide path” for visibility improvement will not be achieved at each of these areas without additional emission reductions.

NDEP claims that the reduction in SO₂ and NO_x emissions outlined in the draft SIP from sources within Nevada (in percent) is greater than the fraction of the extinction contributed by Nevada sources at each of these areas. However, this claim is largely an artifact of the large emission reduction which has already occurred at Mohave associated with discontinuing use of coal at this facility. NDEP does not appear to have aggressively sought additional emissions reductions at other emission sources under its jurisdiction.

In addition, the above claim is based on an assumption that all emission reductions have an equal effect on visibility at the Class I areas of interest. In fact, sources affect visibility differently based on their proximity to any particular Class I area. For visibility to improve at an individual Class I area, emission reductions may be required at specific sources rather than for the state as a whole. For example, with respect to Zion and Bryce Canyon National Parks, an equivalent emission reductions at Reid Gardner would be expected to have a larger benefit compared to Mohave due to the closer proximity of Reid Gardner to the areas of interest.

While the emission reductions at Mohave are important, the data presented in Nevada’s draft regional haze SIP also show that emission reductions at Mohave are insufficient by themselves to meet the 2018 visibility target goals at Class I areas outside of Nevada. Additional emission reductions will be needed at other sources to achieve meaningful improvements to visibility at areas such as Zion and Grand Canyon. For example, if each Nevada source were expected to individually contribute to “Nevada’s emission reduction share,” the emissions reductions and improvement in visibility attributable to the proposed BART at Reid Gardner falls short of the goals provided in Nevada’s regional haze SIP.

6.0 SUMMARY AND CONCLUSIONS

This chapter summarizes the major findings from the review of the April 2009 draft Nevada regional haze SIP. The findings are listed with respect to the major questions identified for this review.

1. Does the SIP sufficiently allow for known and planned future growth of air emission sources in Nevada and neighboring states, in particular coal-fired electrical generating units (EGUs)?
 - Future growth in coal-fired EGUs appears to be underrepresented in the 2018 emission inventory projections contained in the draft Nevada regional haze SIP. If the proposed Ely Energy Center and White Pine Power Projects are included, the 2018 emissions projections appear to be low by about 5,700 tpy for SO₂ emissions and 6,200 tpy for NO_x emissions. Recently, developers for the Ely and White Pine Projects have announced that these projects will not go forward in the immediate future. However, as of early May 2009, the air permit applications being processed at NDEP for both Ely and White Pine appear to remain active. The Ely and White Pine Projects need to be part of Nevada's SIP planning process until such time that the air permit applications are formally withdrawn. At IPP Unit 3 (within 300 km of Jarbidge), these emissions appear to be part of the 2018 WRAP regional emission projections and as such are included as part of Nevada's SIP planning process. However, NDEP should acknowledge that IPP is part of the regional inventory within their SIP.
 - There are inconsistencies between the emissions listed in the 2018 emissions inventory for the Nevada regional haze SIP and allowable emissions established by NDEP air quality permits for several sources, i.e. TS Power Plant and White Pine Power Project. The 2018 emission inventory projections in the regional haze SIP need to be accurate if one is to rely on the results of any modeling to demonstrate whether "reasonable further progress" has been achieved.
 - The proposed Toquop Energy Project near Mesquite is not explicitly listed in the 2018 emissions inventory, but these emissions are relatively close to the emissions assigned to an "unnamed" coal-fired EGU. Although the emissions from the unnamed plant match with the Toquop Project, the resulting visibility impact projections for 2018 depend also on how the "unnamed" plant was incorporated into the 2018 visibility modeling. Based on the proposed location for Toquop, it is expected that this plant will potentially affect regional haze at Zion National Park, Bryce Canyon National Park, and Grand Canyon National Park. The projections of 2018 visibility at these areas appear to be in error as the future Toquop emissions were not properly represented in the 2018 modeling.
 - The April 2009 Nevada SIP does not include future emissions from the Power County Advanced Energy Center, which was recently issued a permit by the Idaho Department of Environmental Quality for a site near American Falls, ID. This project could have the potential to impact visibility at the Jarbidge Wilderness.

2. Does the SIP contain adequate measures under Best Available Retrofit Technology (BART) for “BART-eligible” emission units under jurisdiction of the NDEP?
- The proposed SO₂ BART emission rate for Reid Gardner Units 1, 2, and 3 would actually allow for an increase in SO₂ emissions above the baseline. By allowing for an emissions increase, the Nevada SIP is inconsistent with the regulatory intent of BART. It is proposed that Nevada rectify this error by establishing a “two-tiered” BART limit for SO₂ emissions at Reid Gardner. The current proposed BART limit could be applied to a short-term (i.e., 1-hour) averaging time, while a more stringent limit could be established based on a 30-day rolling average. This would allow for short periods of higher emissions which appear to be present based on historical data, but would also require that the company operate the Reid Gardner SO₂ control systems in a manner consistent with their historical practice. Based on the WRAP 2018 emission projections, Reid Gardner already achieves SO₂ emissions in the range of 0.03 to 0.04 lb/MMBtu, so the 30-day rolling average BART limit needs to be in this range to prevent any future degradation of the local and regional visibility conditions.
 - The proposed NO_x BART limit for Reid Gardner Unit 3 is higher at 0.28 lb/MMBtu compared to the proposed NO_x limit of 0.20 lb/MMBtu for Units 1 and 2. The draft SIP does not provide an adequate explanation or justification for why Unit 3 requires a higher NO_x emission rate for BART.
 - The SIP explains that selective catalytic reduction (SCR) was evaluated for potential application as BART at Reid Gardner, but rejected based on cost considerations. However, it does not appear that NDEP conducted a critical evaluation of the SCR costs supplied by NV Energy and instead has accepted the company’s costs “at face value.” If cost is to be used as part of the decision to reject SCR as BART for Reid Gardner, the company’s SCR cost estimates need to be properly vetted.
 - The control efficiency used by Nevada in evaluating SCR for Reid Gardner appears to be underestimated. In other situations where SCR was reviewed under BART, the post-SCR NO_x emission rate is consistently 0.07 lb/MMBtu. At Reid Gardner, the proposed post-SCR emissions rate ranged from 0.083 to 0.098 lb/MMBtu. The draft SIP does not explain why 0.07 lb/MMBtu cannot be achieved using SCR at Reid Gardner. If the draft SIP applied a more realistic post-SCR emission rate, the cost evaluation for SCR at Reid Gardner would also be more favorable.
 - The post-BART modeling for Reid Gardner shows no significant improvement in visibility at nearby Class I areas. The lack of improvement in the post-BART modeling may reflect an inaccurate emissions inventory that failed to account for changes in the post-BART emissions proposed at Reid Gardner. If so, the inventory needs to be corrected and accurate modeling performed at Reid Gardner in order to meet the procedural requirements of the SIP. On the other hand, if the Reid Gardner inventory is accurate, then the modeling indicates a failure of the draft SIP to craft a BART proposal

that contains any meaningful emissions reductions and associated visibility improvement. If a more appropriate BART emission limit were established at Reid Gardner, it is believed that the post-BART modeling would show visibility improvement at Grand Canyon and other nearby Class I areas.

- Even after application of BART technologies at Mohave and Reid Gardner, the post-BART visibility modeling continues to show that emissions from Mohave and Reid Gardner would continue to “cause or contribute” to visibility impairment at nearby Class I areas, including Grand Canyon National Park. If these modeling results are accurate, Nevada should consider more stringent BART emission levels that further reduce or eliminate visibility impairment caused by these sources and even consider emission reductions that are “beyond BART” as have other states where BART has proven to be ineffective at providing the emission reductions needed to achieve “reasonable further progress” toward the national visibility goal.
3. Does the SIP adequately address and mitigate Nevada’s contribution to visibility impairment at Class I areas outside of Nevada, in particular National Parks in the southwestern United States that are presently known to be adversely impacted by Nevada emissions (i.e., Zion, Bryce Canyon, and Grand Canyon National Parks)?
- Regional modeling using the 2018 WRAP inventory projections show that visibility at Grand Canyon, Zion, and Bryce Canyon National Parks will not achieve the Uniform Rate of Progress (URP) goals and that the “glide path” for visibility improvement to natural conditions by 2064 will not be achieved without additional emission reductions. This finding occurs even without considering that future growth from Nevada coal-fired EGUs appears to be significantly underrepresented in the 2018 inventory. Given that source emissions from within Nevada are shown to “cause and contribute” to visibility impairment at Class I areas outside of the state after 2018, Nevada needs to revisit its draft regional haze SIP and craft an emissions reduction plan that helps achieve the URP goals at Class I areas outside of Nevada. Achieving the national visibility goal and meeting the 2018 URP milestones will require aggressive actions from all states in the region, including Nevada. Nevada has established BART emission limits in the draft SIP that fail to provide meaningful improvement in visibility conditions and that continue to show Nevada’s emissions sources will “cause and contribute” to visibility impairment. These findings demonstrate that Nevada’s draft regional haze SIP as written fails to meet its primary objective of providing the initial step toward meeting the national visibility goal.

7.0 REFERENCES

1. Clean Air Act, Section 169A.
2. Stationary Sources Joint Forum, Western Regional Air Partnership, information available at www.wrapair.org
3. Air Quality Modeling Forum, Western Regional Air Partnership, information available at www.wrapair.org
4. Director's Review and Preliminary Determination of Permit Issuance for Toquop Energy LLC, Toquop Energy Project; Nevada Division of Environmental Protection, December 17, 2007.
5. Director's Review and Preliminary Determination of Permit Issuance for Sierra Pacific Resources Company, Ely Energy Center; Nevada Division of Environmental Protection, October 29, 2007.
6. Business Wire; February 9, 2009, available at <http://investors.nvenergy.com>
7. Class I Application Review for White Pine Energy Associates LLC, White Pine Energy Station; Nevada Division of Environmental Protection, December 28, 2006.
8. Las Vegas Sun, March 5, 2009, available at www.lasvegassun.com
9. Class I Air Quality Operating Permit No. AP4911-1349; Nevada Division of Environmental Protection.
10. Sevier Power Company, LLC; <http://sevierpower.com>
11. Conditional Extension of Approval Order #DAQE-AN0327010-04; Utah Department of Environmental Quality; April 25, 2008.
12. WRAP 2018 Base Case (Version I) Emissions Inventory, available at www.wrapair.org
13. Sourcewatch; www.sourcewatch.org
14. Statement of Basis, Southeast Idaho Energy LLC/Power County Advanced Energy Center, Idaho Department of Environmental Quality.
15. WRAP 2018 Point Source Emissions-Pivot Tables; available at www.wrapair.org
16. Revised Nevada Division of Environmental Protection BART Determination Review of NV Energy's Reid Gardner Generating Station Units 1, 2, and 3; April 15, 2009.

17. Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations; Final Rule; Federal Register July 6, 2005.
18. WRAP 2018 Preliminary Reasonable Progress Emissions Inventory – Final, Revised; Prepared for WRAP by Eastern Research Group, June 18, 2007.
19. WRAP Regional BART Status; March 27, 2009, available at www.wrapair.org
20. DEQ BART Report for the Boardman Power Plant; Oregon Department of Environmental Quality, Updated December 19, 2008.
21. National Park Service comment letter on Nevada’s draft regional haze State Implementation Plan, March 6, 2009.
22. BART Analysis for Reid Gardner Station Unit 1; Prepared by CM2MHill for NV Energy, Inc.; Revised October 2008.
23. State of Kansas Air Quality State Implementation Plan, Regional Haze, July 15, 2008 (Draft).

Additional Data Sources Considered

Nevada Division of Environmental Protection, Bureau of Air Quality Planning, General information on April 2009 draft regional haze State Implementation Plan; available at <http://ndep.nv.gov/baqp/planning.html>

ATTACHMENT 1

Information on Author: D. Howard Gebhart

D. HOWARD GEBHART
Environmental Compliance Section Manager

Résumé

Summary of Qualifications

Mr. Gebhart has over 25 years' experience in air quality permitting and compliance specializing in issues affecting regulated industries. His expertise lies with permitting and support of the ethanol industry. He manages the environmental compliance section at Air Resource Specialists, Inc., and provides technical studies and evaluations; and prepares models, client permit applications, and air emission calculations. He is well experienced in working with the federal Clean Water Act, Clean Air Act, Resource Conservation and Recovery Act (RCRA), and many similar programs enacted in many states throughout the U.S.

Professional Experience

- Provides technical studies and evaluations, prepares models, and prepares permit applications for a wide variety of clients.
- Provides emissions inventories, dispersion modeling, regulatory analysis and interpretation, and air compliance auditing.
- Prepares applications for new source permits under federal Prevention of Significant Deterioration (PSD) and state construction and operating permit programs.
- Provides technical studies supporting Environmental Impact Statements (EISs) and Environmental Assessments (EAs) under the National Environmental Policy Act (NEPA).
- Manages the Environmental Compliance Section team.
- Performs permitting and air quality studies for bio-fuel (ethanol), oil & gas /petroleum, mining and minerals, semiconductor, and National Park Service projects, with experience representing both government and private clients.
- Performs air pathway evaluations for releases of hazardous air pollutants from Superfund sites, hazardous waste sites, and incinerators.
- Models the potential consequences of accidental releases of hazardous materials.

Work History

1997-Present Environmental Compliance Section Manager,
Air Resource Specialists, Inc., Fort Collins, CO
1993-1996 District Manager, Trinity Consultants, Inc., Fort Collins, CO
1981-1993 Senior Air Quality Scientist, ENSR Consulting & Engineering, Inc., Fort Collins, CO
1979-1981 Utah Department of Health, Bureau of Air Quality, Salt Lake City, UT

Educational Background

M.S., Meteorology, University of Utah, 1979
B.S., Professional Meteorology, Saint Louis University, 1976

Memberships

Air & Waste Management Association
National Weather Association
Colorado Mining Association
Nevada Mining Association
Nebraska Industrial Council on Environment



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Fort Collins, CO 80525

Environmental Consultants

Telephone: 970-484-7941
Web site: www.air-resource.com

Previous Service as Expert Witness

Mr. Gebhart has not served as an expert witness at trial in the most recent four years.

Mr. Gebhart did serve as an expert witness in a recent arbitration case:

- Adkins Energy, LLC v. Lurgi PSI, Inc. v. Ronning Engineering Company, Inc. American Arbitration Association, Case No. 51 198 Y 00300 05.

Mr. Gebhart has served as an expert witness in two recent administrative hearings:

- Appeal of Air Quality Permit # 1756 Issued to Vulcan Materials Company. Hearing before the Albuquerque – Bernalillo County Air Quality Control Board.
- Hearing on Air Quality Permit for Western Water & Power Production, LLC, Proposed Estancia Biomass Power Generation Plant. Hearing before State of New Mexico Secretary of Environment, Case AQCA 06-42(P).

Mr. Gebhart was retained as an expert witness in two other cases involving an appeal of an air quality permit. Both cases were settled prior to any hearing or trial.

- Stanley R. Atherton, David B. Gooch, and Mark A. Hertel et al v. Abengoa Bioenergy of Indiana. Appeal of Air Quality Permit 129-23484-00050 issued by the Indiana Department of Environmental Management.
- Coshocton County Citizens for a Safe Community et al v. Koncelik et al. Appeal of air quality permit for Coshocton Ethanol LLC, Coshocton, OH. ERAC Case Nos. 165768-72 and 99773.

Publications

Mr. Gebhart has not authored any peer-reviewed publications in the last four years.

SECTION D.2.2.4.3

NEVADA'S RESPONSE

(to Conservation Organizations' Comment Letter)

2.2.4.3 Nevada's Response

NDEP received written comments via email and FAX from a group of NGOs regarding Nevada's draft regional haze SIP on May 20, 2009. Attached to the NGO letter and included in the comments by reference is a report by D. Howard Gebhart of Air Resources Specialists, Inc. prepared for the Western Resource Advocates and National Parks Conservation Association titled *Technical Review of Draft Nevada State Implementation Plan for Regional Haze (April 2009) Expert Report* (Tech Review). The Tech Review is a support document for issues summarized in the NGO comments.

The NGO comments focus on 5 main areas: the FLM consultation process, the projected 2018 emission inventory, the BART determination for Reid Gardner Generating Station, reasonable progress for Class I areas in adjacent states, and inclusion of specific sources in the projected 2018 emission inventory. The NGO comments are reproduced below in italics, while NDEP's responses are in plain text. The NGOs listed five specific comments with bullets under some comments. NDEP has not identified any specific comments in the Tech Review and, as such, has not responded specifically to items contained therein.

NGO General Comment:

Below is a summary of comments on the Nevada Draft RH SIP. For a full description of our comments, please refer to the Technical Review, which is attached hereto.

NDEP Response:

As indicated above, Nevada has reviewed the Tech Review and determined that all of the significant comments in the Tech Review are well summarized in the NGO comment letter. Therefore, NDEP has used the Tech Review to assist in understanding the NGO comments, but has only responded to the items presented in the NGO letter.

NGO Comment 1:

1. The public notice for the RH SIP fails to contain evidence that the State of Nevada has met in person with the Federal land managers for the affected Class I areas as is required by 42 U.S.C. § 7491(d). In addition, the public notice for the Nevada RH SIP fails to contain a summary of the conclusions and recommendations of the Federal land manager as is required by 42 U.S.C. § 7491(d).

NDEP Response:

NDEP has fully engaged the Federal Land Manager (FLM) community through participation in the regional planning process, requesting review and comment on draft BART determinations beginning October 2008, providing a draft SIP for FLM review in early January 2009, and responding to initial FLM comments on April 17, 2009. This process is in full agreement with an August 1, 2006 letter from the FLMs (signed by Sandra V. Silva, USFWS and Christine L. Shaver, NPS) to the individual states outlining the regional haze consultation process with the FLM agencies. Mr. Bruce Polkowsky, primary Department of Interior contact for regional haze, supports Nevada's position (June 4, 2009 phone call between Bruce Polkowsky and Frank Forsgren, NDEP) that we have met our FLM consultation requirements and stated FLMs

typically do not require any “in person” consultation (August 22, 2008 phone call between Bruce Polkowsky and Adele Malone, NDEP).

In addition, NDEP included our response to FLM comments as Appendix C in our public review draft RH SIP dated April 2009. The *Notice of Public Comment Period Beginning April 17, 2009 and a Public Hearing on May 20, 2009* provides a link to the draft SIP, including Appendix C, which summarizes and responds to FLM comments on Nevada’s draft RH SIP. Therefore, the public notice does provide a summary of FLM comments by reference.

This comment relates only to the consultation and public notice process and does not affect the conclusions and recommendations NDEP presents in Nevada’s RH SIP. No changes were made to the SIP as a result of this comment.

NGO Comment 2:

2. The RH SIP does not sufficiently allow for known and planned future growth of air emission sources in Nevada and neighboring states, in particular coal-fired electrical generating units (EGUs).

NDEP Response:

Each of the following four bulleted comments will be responded to individually. However, some background on the development of regional emission inventories is necessary to address these comments.

Nevada has fully participated in the regional planning process through our involvement with WRAP forums and workgroups, including the Emissions Forum and Stationary Sources Joint Forum. The emissions inventories relied upon by the WRAP and member states were developed by consultants under the direction of these forums through a consensus-based process. The inventory development methodologies were utilized for all WRAP states’ inventories. The inventories utilized by WRAP and the member states are deemed by most observers to be the most robust and accurate available.

Two emissions scenarios were developed by WRAP, a baseline scenario and a projected scenario. The regional haze baseline period includes years 2000 through 2004, and is represented by 2002, while the projected inventories denote 2018 emissions. The year 2018 was selected as it represents the first milestone date for demonstrating reasonable progress.

The base case 2018 projected emission inventory was initially developed during 2005 by Eastern Research Group, Inc. (ERG). *WRAP Point and Area Source Emissions Projections for the 2018 Base Case Inventory, Version 1*¹⁴, prepared by ERG, documents the development of the 2018 base case emission inventory. ERG refined the 2018 preliminary reasonable progress emission inventory in early 2007 as documented in Technical Memorandum *WRAP 2018 Preliminary Reasonable Progress Emissions Inventory – Final, Revised*¹⁵.

¹⁴ Available at http://wrapair.org/forums/ssjf/documents/eictts/docs/WRAP_2018_EI-Version_1-Report_Jan2006.pdf

¹⁵ Available at http://wrapair.org/forums/ssjf/documents/eictts/Projections/PRP18_EI_tech%20memo_061607.pdf

The growth analysis utilized for development of the projected inventory identified future EGUs needed in order to meet projected electricity demand in 2018. The basis of the projected electricity demand is the Energy Information Administration's (EIA) annual 2018 energy projections for four electricity market module regions representing the WRAP region. The base case 2018 inventory (base18b) used the EIA projections released in 2005, while the preliminary reasonable progress inventory (PRP18a) utilized projections released in 2007.

WRAP assumed a typical future coal-fired EGU has a capacity of 500 MW and operates at BACT levels with a capacity threshold of 0.85. WRAP then estimated that 18 typical coal-fired EGUs will need to be built prior to 2018 to meet projected demand. The future coal-fired EGUs were allocated based upon current state-level capacity (i.e., sum of existing, under construction, and permitted). The EGUs were then allocated to specific counties based on announced plans to build coal-fired EGUs.

Based on a long history of permitting EGUs in Nevada, the Nevada Bureau of Air Pollution Control (BAPC) expected that not all permit applications would result in operating EGUs. Therefore, BAPC deemed that two coal-fired EGUs were either being permitted or under construction for the purposes of the projected inventory, the 200 MW Northern Nevada Energy (Newmont) facility (referred in the NGO comments as the TS Power Plant) and the 1500 MW White Pine Energy Association (LS Power) facility. In addition to the permitted or under construction EGUs, the 2018 inventory projected one 500 MW coal-fired EGU in Nevada to meet anticipated electricity demand growth.

The three proposed coal-fired EGUs included in the 2018 projected emission inventory are shown in Table 3-5 of Nevada's RH SIP as: Future Coal EGU (Newmont – Northern Nevada Energy), Future Coal EGU (White Pine Energy Association/LS Power), and Future Coal EGU (A).

Although Nevada has several valid applications for operating permits to construct EGUs, only one EGU in Nevada, Northern Nevada Energy, has been granted an operating permit to construct in the last few years. In addition, the White Pine Power Project does not yet have an approved operating permit to construct. NDEP cancelled the public comment period and hearing for this permit action as a result of an announcement by White Pine Energy Associates, LLC¹⁶ that the plans to build the White Pine Energy Station have been indefinitely postponed. Ely Energy Center's permit application has also been indefinitely postponed by NV Energy¹⁷. For this very reason, proposed permit activities are not, as a matter of course, explicitly included in projected emission inventories.

This comment acknowledges the fact that projected emissions inventories become outdated as soon as they are completed. However, Nevada deems the emissions inventories as accurate and representative of 2018 emissions as possible. No changes to Nevada's RH SIP were made as a result of this comment.

¹⁶ <http://lspower.com/News/newsArticle030509.htm>

¹⁷ <http://investors.nvenergy.com/phoenix.zhtml?c=117698&p=irol-newsArticle&ID=1254617&highlight=>

NGO Comment 2, 1st bullet:

- *Future growth in coal-fired EGUs appears to be underrepresented in the 2018 emission inventory projections contained in the draft Nevada regional haze SIP. If the proposed Ely Energy Center and White Pine Power Projects are included, the 2018 emissions projections appear to be low by about 5,700 tpy for SO₂ emissions and 6,200 tpy for NO_x emissions. NDEP has issued draft PSD permits for both the Ely Energy Center and White Pine power plants. As of early May 2009, the draft PSD permits have not been terminated by NDEP nor have the air permit applications been withdrawn by the applicants. Accordingly, the Ely and White Pine Projects need to be part of Nevada's SIP planning process.*

NDEP Response:

As discussed above, the 2018 EGU inventory is based on projected electricity demand. The demand side suggested that not all permit applications would result in operating EGUs, as did BAPC's permitting experience with EGUs. Therefore, only one of the two proposed coal-fired EGUs in White Pine County was included in the 2018 emission inventory. Note that the permit applications for both the Ely Energy Center and White Pine Energy Association have been indefinitely postponed by the applicants, although the permit applications have not been withdrawn. In addition, Southern California Edison¹⁸ has announced a decision to decommission the Mohave Generating Station and remove the generating facility from the site.

Therefore, since emissions from the Mohave Generating Station and proposed White Pine project are included in the 2018 emission inventory (PRP18a), the inventory actually over-represents 2018 emissions from coal-fired EGUs in Nevada.

NDEP also notes that although the EIA energy projections suggest additional generating capacity will be required in the future, the electrical infrastructure has absorbed the reduction in generating capacity in Nevada (in part due to the suspension of activities at the Mohave Generating Station at the end of 2005) and elsewhere without significant problem. NDEP anticipates renewable energy projects will provide substantial generating capacity to meet future electrical demand in Nevada.

No changes were made to the SIP in response to this comment.

NGO Comment 2, 2nd bullet:

- *There are inconsistencies between the emissions listed in the 2018 emissions inventory for the Nevada regional haze SIP and allowable emissions established by NDEP air quality permits for several sources. For example, the proposed emissions from the TS Power Plant and White Pine Power Project are underestimated in the RH SIP inventory.*

NDEP Response:

The TS Power Plant Operating Permit to Construct application was revised August 2007, and the first source tests were conducted April 2008. A complete Class I application was recently submitted to the Nevada BAPC by the facility. The White Pine Power Project operating permit to construct application was revised in December 2006. Note that the White Pine Power Project has been indefinitely postponed, as noted above.

¹⁸ <http://www.edison.com/pressroom/pr.asp?bu=&year=0&id=7234>

The base case 2018 emission inventory was prepared in 2005 and the preliminary reasonable progress inventory was revised in early 2007. The emissions listed in these inventories represent NDEP's best estimate at the time the inventories were prepared. No changes were made to the SIP in response to this comment.

NGO Comment 2, 3rd bullet:

- *The proposed Toquop Energy Project near Mesquite is not explicitly listed in the 2018 emissions inventory, but these emissions are relatively close to the emissions assigned to an “unnamed” coal-fired EGU. Although the emissions from the unnamed plant are similar to those of the Toquop Project, the resulting visibility impact projections for 2018 depend also on how the “unnamed” plant was incorporated into the 2018 visibility modeling. Based on the proposed location for Toquop, it is expected that this plant will potentially affect regional haze at Zion National Park, Bryce Canyon National Park, and Grand Canyon National Park. The projections of 2018 visibility at these areas are in error if the future Toquop emissions are not properly represented in the 2108 modeling.*

NDEP Response:

Future Coal EGU (A) identified and discussed under the NGO comment above, may be considered as an emissions surrogate for the proposed Toquop Energy Project. The Toquop Energy Project has applied for and NDEP has issued a draft operating permit to construct for public comment. As of September 4, 2009 NDEP is in the process of responding to public comment and has not yet issued an operating permit to construct.

The rationale for projecting future EGUs has been described above in Nevada's responses to NGO comments. NDEP acknowledges that Future Coal EGU (A) was not located in immediate proximity to the proposed Toquop Energy Project, which may slightly effect the 2018 visibility projection if the Toquop Energy Project is, in fact, built as proposed. However, recall that Future Coal EGU (A) is only a placeholder to account for emissions resulting from increased electrical demand in 2018.

In addition, Nevada BAPC's *Class I Application Review for Toquop Energy, LLC* dated December 21, 2007 summarizes the results of the visibility analysis conducted as part of the permit application process, as follows:

“7.9.4 Visibility Analysis

Regional haze modeling was conducted with CALPUFF using the FLAG guidance for Bryce Canyon National Park, Grand Canyon National Park, Zion National Park, Capitol Reef National Park and Sycamore Canyon Wilderness. In addition, regional haze modeling results have been provided for Lake Mead National Recreation Area using the FLAG guidance. The regional haze modeling results are presented in Table 7.5 below. As indicated, the regional haze modeling results using the FLAG guidance have no days above a 5% change in extinction at any Class I area during any year modeled. Therefore, according to the FLAG guidance, the proposed Toquop project does not have a significant regional haze impact and no further modeling is required.

TABLE 7.5 – Regional Haze Modeling Results - FLAG (2003 – 2005)

Class I Area	2003			2004			2005		
	Days > N%		MAX% ΔB_{ext}^1	Days > N%		MAX% ΔB_{ext}^1	Days > N%		MAX% ΔB_{ext}^1
	ΔB_{ext}			ΔB_{ext}			ΔB_{ext}		
5%	10%	5%	10%	5%	10%				
MVISBK=2, FLAG Background, 2-km Grid									
Capitol Reef	0	0	3.04	0	0	1.42	0	0	2.17
Sycamore Canyon	0	0	1.69	0	0	1.01	0	0	1.22
MVISBK=2, FLAG Background, 500-m Grid									
Bryce Canyon	0	0	4.03	0	0	0.91	0	0	1.85
Grand Canyon	0	0	2.75	0	0	4.33	0	0	3.32
Zion	0	0	4.70	0	0	1.95	0	0	4.61

NOTES: 1 ΔB_{ext} = change in atmospheric light condition.”

Therefore, the proposed Toquop Energy Project has been fully reviewed for its potential visibility impacts at nearby Class I areas and it has been determined that the project does not have significant visibility impacts at the Class I areas within 300 km of the proposed project. No changes were made to the SIP in response to this comment.

NGO Comment 2, 4th bullet:

- *The April 2009 Nevada SIP does not include future emissions from the Power County Advanced Energy Center, which was recently issued a permit by the Idaho Department of Environmental Quality for a site near American Falls, ID. This project could have the potential to impact visibility at the Jarbidge Wilderness.*

NDEP Response:

As stated earlier in our response to NGO comments, the base case 2018 projected emission inventory (base18b) was initially developed during 2005 and the refined 2018 preliminary reasonable progress emission inventory (PRP18a) in early 2007. Idaho Department of Environmental Quality issued a Permit to Construct for the Southeast Idaho Energy Power County Advance Energy Center project February 10, 2009, well after the 2018 projected emission inventories used in Nevada’s RH SIP were completed. In spite of this timing, it is each state’s decision and responsibility to ensure that the WRAP’s projected 2018 emission inventory for its sources is accurate and complete. Nevada has no role in how Idaho reports the emissions from this proposed project.

Finally, the project was evaluated by the Idaho Department of Environmental Quality and the FLM community for potential impacts to sensitive Class I areas as a major source under Prevention of Significant Deterioration (PSD) regulations and the project was found to have negligible impact on the nearest Class I area, Craters of the Moon, located 70 km from the project site. The FLMs determined that a more detailed Class I visibility analysis was not

necessary¹⁹. The Jarbidge Wilderness Area is more than 200 km from the proposed project. No changes were made to the SIP in response to this comment.

NGO Comment 3:

3. The RH SIP does not contain adequate measures under Best Available Retrofit Technology (BART) for “BART-eligible” emission units under jurisdiction of the NDEP.

NDEP Response:

BART is one component of Nevada’s long-term strategy to meet the national visibility goal. Nevada deems our 2018 progress toward the national visibility goal reasonable, both for the Jarbidge Wilderness Area and for Class I areas in adjacent states, in part because our 2018 reasonable progress is better than the 2018 uniform rate of progress. Therefore, Nevada deems that the control measures required by Nevada’s BART regulations are adequate. No changes were made to the SIP in response to this comment.

NGO Comment 3, 1st bullet:

- The proposed SO₂ BART emission rate for Reid Gardner Units 1, 2, and 3 would actually allow for an increase in SO₂ emissions above the baseline. By allowing for an emissions increase, the Nevada SIP is inconsistent with the regulatory intent of BART. It is proposed that Nevada rectify this error by establishing a “two-tiered” BART limit for SO₂ emissions at Reid Gardner. The current proposed BART limit (0.25 lb/MMBtu) could be applied to a short-term (i.e., 1-hour) averaging time, while a more stringent limit (0.10 lb/MMBtu) could be established based on a 30-day rolling average. This would allow for short periods of higher emissions which appear to be present based on historical data, but would also require that the company operate the Reid Gardner SO₂ control systems in a manner consistent with their historical practice. By following the approach recommended above, the annual SO₂ emissions from Reid Gardner would not increase and the BART emissions rate would more closely align with the “presumptive BART” recommended by EPA.*

NDEP Response:

Nevada responded to a similar comment from USEPA; see Nevada’s response to USEPA Comment 2 in section D.2.2.2.2 of this appendix. The BART SO₂ emission limit for all units at Reid Gardner was lowered to 0.15 lb/MMBtu, 24-hour average, following the public comment period. NDEP expects NV Energy will operate the post-BART Reid Gardner Generating Station consistent with the highly efficient recent operational history of the facility which has achieved the low SO₂ emission rates noted by the FLMs.

No changes were made to Nevada’s RH SIP as a result of this comment.

NGO Comment 3, 2nd bullet:

- The proposed NO_x BART limit for Reid Gardner Unit 3 is higher at 0.28 lb/MMBtu compared to the proposed NO_x limit of 0.20 lb/MMBtu for Units 1 and 2. The draft SIP does not provide an adequate explanation or justification for why Unit 3 requires a higher NO_x emission rate for BART.*

¹⁹ http://www.deq.idaho.gov/air/permits_forms/permitting/pcaec/app_f_0408.pdf

NDEP Response:

NDEP responded to similar comments from the FLMs as documented in Nevada's responses in Appendix C of this SIP, Comment 13, and in section D.2.2.3.2 of this appendix, Comment 13.

No changes were made to the RH SIP due to this comment.

NGO Comment 3, 3rd bullet:

- *The SIP explains that selective catalytic reduction (SCR) was evaluated for potential application as BART at Reid Gardner, but rejected based on cost considerations. However, it does not appear that NDEP conducted a critical evaluation of the SCR costs supplied by NV Energy and instead has accepted the company's costs "at face value". If cost is to be used as part of the decision to reject SCR as BART for Reid Gardner, the company's SCR cost estimates need to be properly vetted.*

NDEP Response:

NDEP responded to NPS follow-up comments regarding SCR costs, specifically Comments 7 and 17 in section 2.2.3.2 of this appendix. NDEP evaluated the significance of these comments by conducting additional economic analyses for the three units at the Reid Gardner Generating Station under alternative cost and emissions scenarios, as described in NDEP's response to Comment 7. Analyses of the alternative cost scenario data lead NDEP to the same BART conclusions NDEP reached during our initial determination, although the alternative cost analyses utilized lower costs and greater emissions reductions.

No changes were made to Nevada's RH SIP as a result of this comment.

NGO Comment 3, 4th bullet:

- *The control efficiency used by Nevada in evaluating SCR for Reid Gardner appears to be underestimated. In other situations where SCR was reviewed under BART, the post-SCR NO_x emission rate is consistently 0.07 lb/MMBtu. At Reid Gardner, the proposed post-SCR emissions rate ranged from 0.083 to 0.098 lb/MMBtu. The draft SIP does not explain why 0.07 lb/MMBtu cannot be achieved using SCR at Reid Gardner. If the draft SIP applied a more realistic post-SCR emission rate, the cost evaluation for SCR at Reid Gardner would be more favorable.*

NDEP Response:

See NDEP's response to the NGO comment above. NDEP's alternative cost analyses for SCR at Reid Gardner, discussed above and in NDEP's response to NPS' follow-up to Comment 7 in section D.2.2.3.2 of this appendix, utilized an emission rate of 0.07 lb/MMBtu. The alternative cost analyses indicate that ROFA with Rotamix is NO_x BART for Reid Gardner. No changes were made to the SIP as a result of this comment.

NGO Comment 3, 5th bullet:

- *The post-BART modeling for Reid Gardner shows no significant improvement in visibility at nearby Class I areas. The lack of improvement in the post-BART modeling reflects the failure of the draft SIP to craft a BART proposal that contains any meaningful emissions reductions at Reid Gardner, and actually allows for an SO₂ emissions increase. If more*

appropriate BART emission levels were established at Reid Gardner, it is believed that the post-BART modeling would show visibility improvement at Grand Canyon and other nearby Class I areas.

NDEP Response:

Table 5-11 in the SIP presents the pre- and post-BART visibility results modeled by NV Energy for Reid Gardner, which show only minor improvements in visibility at the five Class I areas within 300 km of the facility. However, the NV Energy modeled emission rates differ from those identified as BART by NDEP, as shown in Table 5-8 of the RH SIP.

As a result of this comment errors were discovered in Tables 5-4, 5-5, 5-6, 5-7, 5-8 and 7-1, as well as Figures 5-2 and 5-3 in the RH SIP which misrepresent the post-BART annual emissions. Note that the NDEP post-BART emission limits did not agree between Tables 5-6 and 5-8. The corrected values are based on the NDEP baseline emissions, NDEP baseline heat input and NDEP BART emission limits. Text in section 5.5 “Summary of BART Control Analyses,” section 5.6 “Visibility Improvement Due to BART Implementation,” section 7.2 “BART Controls” and section 7.9.1.1 “Major and Minor Stationary Sources” was modified to correct the errors and reflect the changes in the tables and figures.

Corrected Table 5-8 shows the NDEP Reid Gardner BART annual emissions of NO_x are approximately 57 percent of those modeled, SO₂ is 43 percent of those modeled, and PM₁₀ is 57 percent of those modeled. The total annual post-BART emissions are 50 percent of those modeled for Reid Gardner. It is generally recognized that there is a linear relationship between modeled emission rates and modeled concentrations when using the CALPUFF modeling system. Therefore, it is reasonable to expect that the modeled visibility improvement is proportionally greater with the lower NDEP BART emission limits than the results using the higher NV Energy modeled limits. NDEP expects significantly greater visibility improvement than those presented in Table 5-11 of this SIP. In addition, it is not expected that Reid Gardner will operate at BART emission limits 24 hours per day 365 days per year. All hours of Reid Gardner operation at SO₂ emissions rates less than 0.15 lb/MMBtu will result in additional improvements to the modeled visibility.

In summary, the installation of BART controls at Reid Gardner will result in significant visibility improvement at the Grand Canyon and the four other Class I areas within 300 km of the facility. In addition, the total annual post-BART emissions from Tracy and Fort Churchill are 50 to 53 percent of those modeled by NV Energy. NDEP expects significantly greater visibility improvement due to the installation of BART than that presented in Tables 5-9 and 5-10 of the SIP. No other changes were made to the SIP as a result of this comment.

NGO Comment 3, 6th bullet:

- *Even after application of BART technologies at Mohave and Reid Gardner, the post-BART visibility modeling continues to show that emissions from Mohave and Reid Gardner would continue to “cause or contribute” to visibility impairment at nearby Class I areas, including Grand Canyon National Park. Nevada should consider more stringent BART emission levels that further reduce or eliminate visibility impairment caused by these sources and even consider emission reductions that are “beyond BART” as have other states where BART has*

proven to be ineffective at providing the emission reductions needed to achieve “reasonable further progress” toward the national visibility goal.

NDEP Response:

Nevada deems our progress toward the national visibility goal reasonable, both for the Jarbidge Wilderness Area and for Class I areas in adjacent states. BART is one of the components of Nevada’s long-term strategy to meet the national visibility goals. Section 7.9.3.2, “Contributions to Impairment at Class I Areas Outside of Nevada,” of Nevada’s RH SIP describes Nevada’s evaluation of whether the SIP includes measures necessary to obtain Nevada’s share of emissions reductions needed to meet the progress goals in adjacent states. None of the adjacent states have contacted Nevada through the consultation process with requests for further emissions reductions from Nevada sources as part of measures necessary to meet their reasonable progress goals. Since the 2018 reasonable progress goal for Jarbidge Wilderness Area exceeds the 2018 uniform rate of progress and other states have not requested Nevada’s assistance in meeting their reasonable progress goals, it is not reasonable to require Nevada sources to consider emissions reductions beyond BART.

As noted earlier in our response to NGO Comment 2, 1st bullet, Southern California Edison has announced that the Mohave Generating Station will be decommissioned and the generating facility will be removed from the site. Therefore, Mohave will no longer impact visibility at any Class I area.

Finally, it is clear from this comment and the supporting text in section 4.3 of the Tech Review, that Mr. Gebhart has confused the regional visibility modeling conducted by the WRAP’s Regional Modeling Center with the post-BART dispersion modeling for estimating the degree of visibility improvement from BART control installation conducted by the facilities. EPA guidance and regulation do not require subject-to-BART facilities to install emission-reducing control technologies that meet specific visibility criteria.

The CAA requires states to consider the following five items in identifying BART controls: 1) costs of compliance, 2) energy and non-air quality environmental impacts of compliance, 3) existing pollution control technology in use at the source, 4) the remaining useful life of the source, and 5) the degree of visibility improvement which may reasonably be anticipated from the use of BART. There is no “cause or contribute” threshold for the post-BART modeling. In addition, see NDEP’s response to the NGO comment above regarding the degree of visibility improvement resulting from the installation of BART at Reid Gardner.

No changes were made to the SIP in response to this comment.

NGO Comment 4:

4. The RH SIP does not adequately address and mitigate Nevada’s contribution to visibility impairment at Class I areas outside of Nevada, in particular National Parks in the southwestern United States that are presently known to be adversely impacted by Nevada emissions (i.e., Zion, Bryce Canyon, and Grand Canyon National Parks).

NDEP Response:

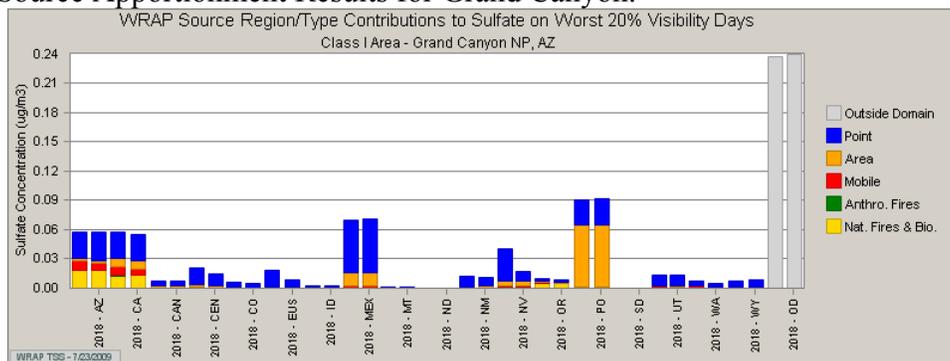
Please see the response to the preceding NGO comment, which identifies the text in Nevada’s RH SIP that describes NDEP’s assessment of the contribution of Nevada emissions to visibility impairment at Class I areas in adjacent states.

Table 4-3 of the SIP presents Nevada’s sulfate extinction contributions to Class I areas outside the state, while Table 4-4 presents Nevada’s nitrate extinction contributions to Class I areas outside the state. For the worst visibility days, Nevada’s contribution to sulfate extinction is 2.8 percent at the Grand Canyon, 4.8 percent at Bryce Canyon and 5.6 percent at Zion. For nitrate extinction, Nevada’s contribution is 2.8 percent at the Grand Canyon, 8.8 percent at Bryce Canyon and 7.9 percent at Zion.

These contribution results are based on the projected base18b emission inventory, as described in section 1.3.2.2 of Nevada’s RH SIP. The base18b inventory does not include any emissions reductions resulting from the installation of BART at facilities in Nevada or the rest of the WRAP region. However, the base18b inventory does include emissions from a projected 2018 Future Coal EGU (A), which represents the White Pine Energy Project in this inventory, and Mohave Generating Station, as discussed above under Comment 2, 1st bullet. Emissions reductions due to the installation of BART at Reid Gardner (reduction of nearly 5,500 tpy NO_x to 2018 emissions inventory), the dismantling of the Mohave Generating Station (elimination of nearly 19,500 tpy NO_x and 8,700 tpy SO₂ from 2018 inventory), and indefinite postponement of permitting/construction of the White Pine Energy Project (elimination of 1,675 tpy NO_x and 1,675 tpy SO₂ from 2018 inventory), all located along the eastern boundary of Nevada, suggest that visibility impacts due to emissions from Nevada will be reduced at Class I areas in Utah and Arizona from those reported above and shown on Figures 1, 2 and 3, below.

Figures 1, 2 and 3 present the worst days sulfate (top image) and nitrate (bottom image) 2002 baseline (plan02c emissions inventory) and 2018 projected (base18b emissions inventory) source apportionment modeling results for Grand Canyon, Zion, and Bryce Canyon, respectively.

Figure 1. Source Apportionment Results for Grand Canyon.



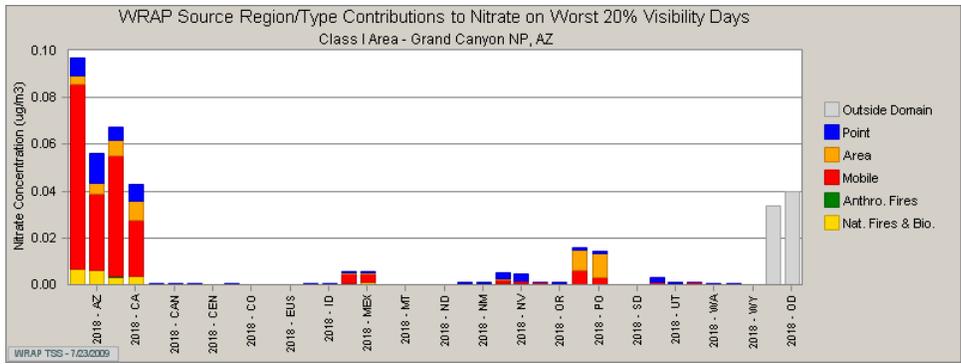


Figure 2. Source Apportionment Results for Zion.

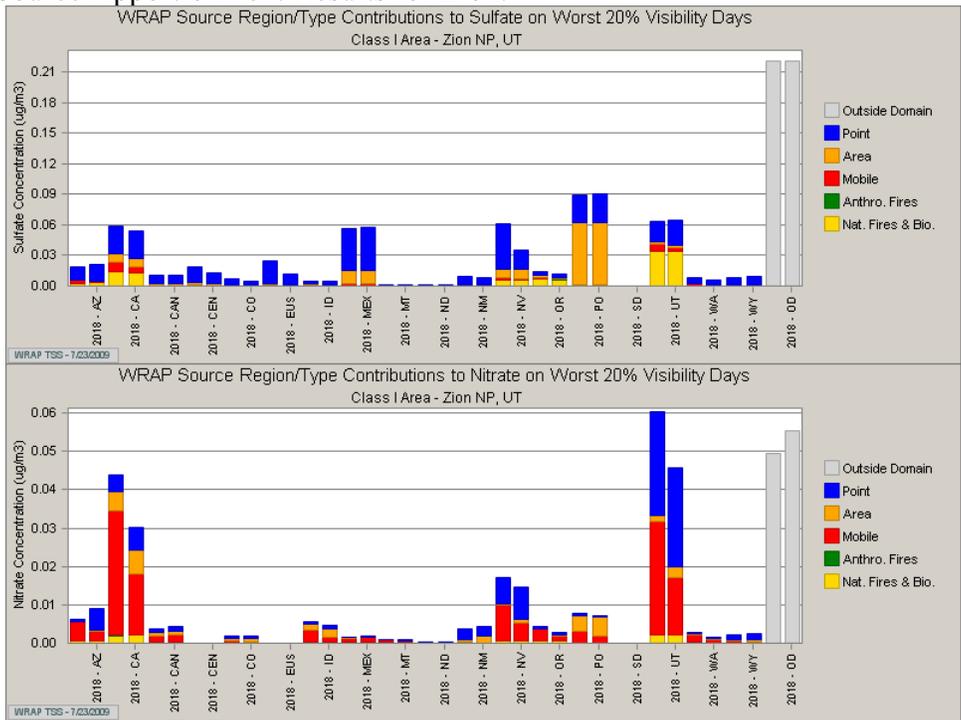
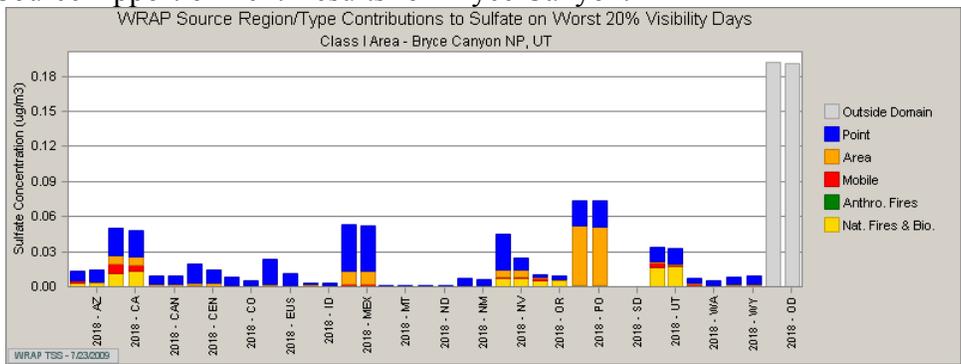
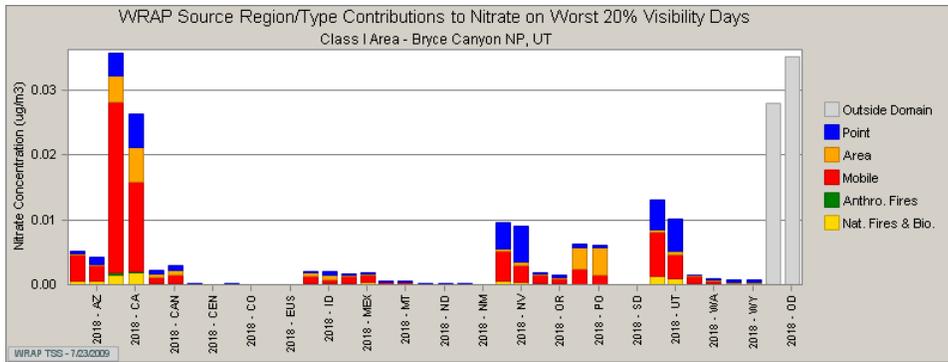


Figure 3. Source Apportionment Results for Bryce Canyon.





Figures 1, 2 and 3 show the relative contributions to visibility impairment as paired bars for each state or source area, the first for the baseline and the second for 2018. These figures also show the relative reduction in contribution by each source area from the baseline to 2018.

Although the Grand Canyon, Zion and Bryce Canyon are not meeting the uniform rate of progress for 2018, it is informative to examine each species contribution to visibility impairment. Figures 4, 5 and 6 show the contributions to visibility impairment by the individual modeled species to these Class I areas. Of particular interest are ammonia nitrate and ammonia sulfate extinction, since these species are predominantly due to emissions from anthropogenic sources.

These figures show that modeling results for these three Class I areas fail to meet the uniform rate of progress glide slope for nitrate and sulfate, except nitrate at Grand Canyon. 2018 sulfate consistently falls approximately 0.5 Mm^{-1} (0.44 to 0.48 Mm^{-1}) short of the URP glide slope for all three areas. Nitrate falls short 0.20 and 0.79 Mm^{-1} at Bryce Canyon and Zion, respectively. However, 2018 nitrate progress at Grand Canyon exceeds the URP glide slope.

Figure 4. Speciated Contributions to Visibility Impairment at Grand Canyon.

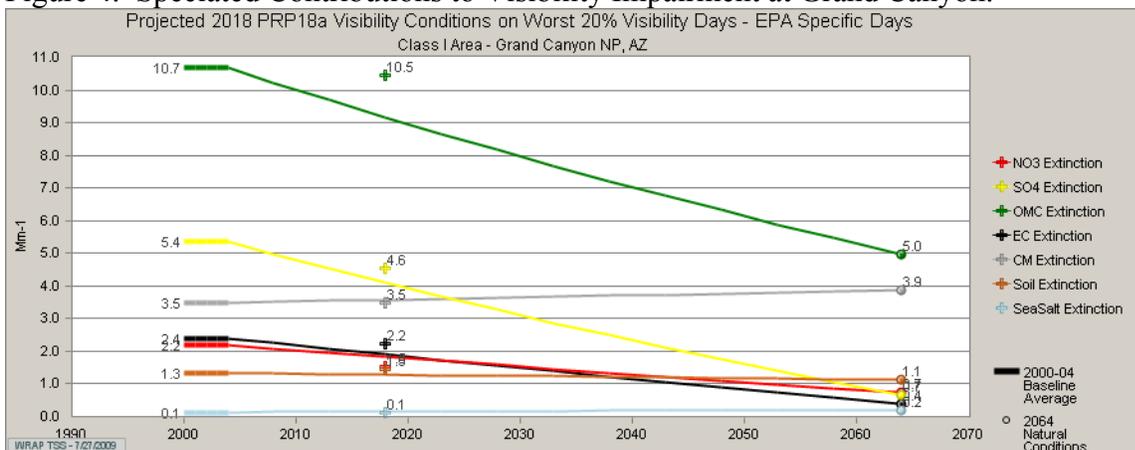


Figure 5. Speciated Contributions to Visibility Impairment at Zion.

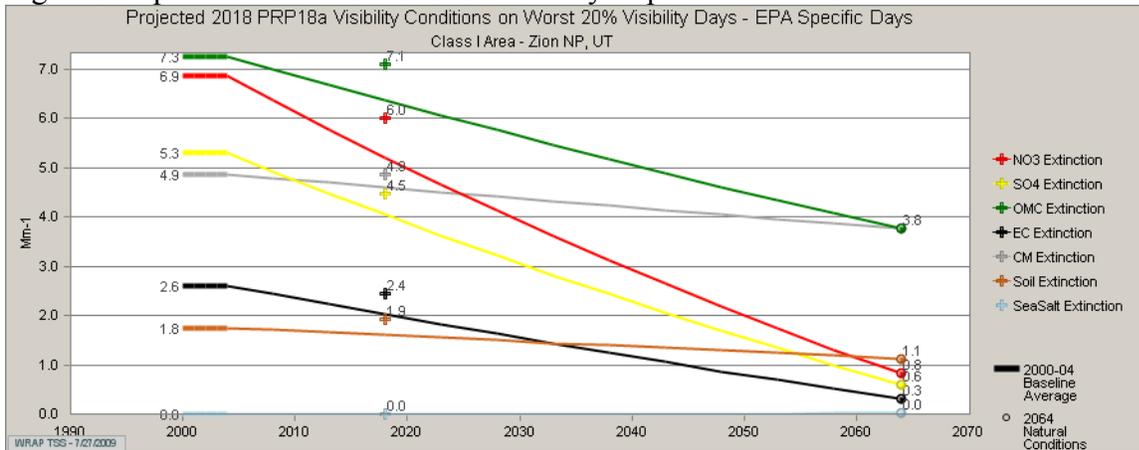
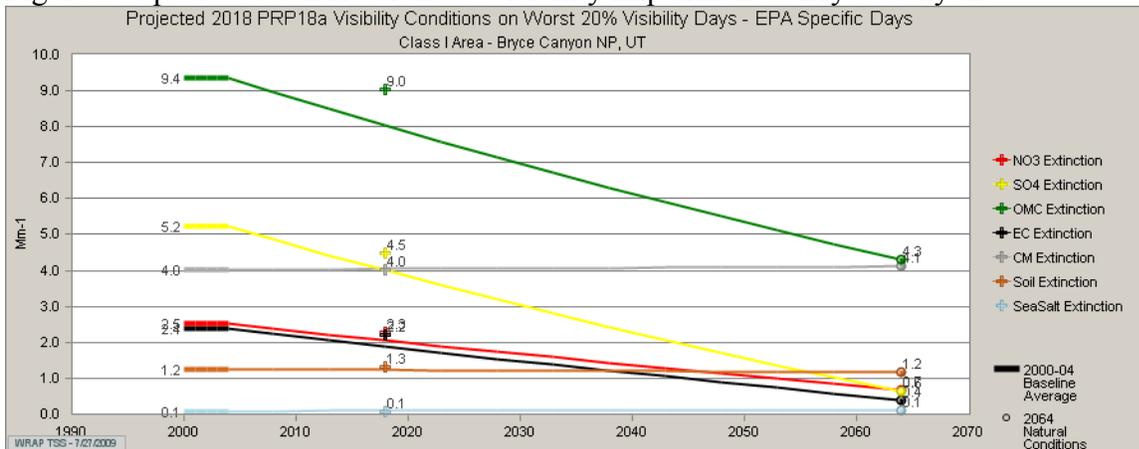


Figure 6. Speciated Contributions to Visibility Impairment at Bryce Canyon.



As per 40 CFR 51.308(d)(1), each state is responsible for establishing goals that provide for reasonable progress toward achieving natural visibility conditions for the mandatory Class I areas within the state. None of the adjacent states have contacted Nevada with requests for further emissions reductions from Nevada sources as part of measures necessary to meet their reasonable progress goals. NDEP deems Nevada’s progress toward the national visibility goal reasonable, both for the Jarbidge Wilderness Area and for Class I areas in adjacent states.

No changes were made to the RH SIP as a result of this comment.

NGO Comment 4, continued:

Regional modeling using the 2018 WRAP inventory projections show that visibility at Grand Canyon, Zion, and Bryce Canyon National Parks will not achieve the Uniform Rate of Progress (URP) goals and that the “glide path” for visibility improvement to natural conditions by 2064 will not be achieved without additional emission reductions. This finding occurs even without considering that future growth from Nevada coal-fired EGUs appears to be significantly underrepresented in the 2018 inventory. As source emissions from within Nevada are shown to “cause and contribute” to visibility impairment at Class I areas outside of the state, Nevada needs to revisit its draft regional haze SIP and craft an emissions reduction plan that helps

achieve the URP goals at Class I areas outside of Nevada. Achieving the national visibility goal and meeting the 2018 URP milestones will require aggressive actions from all states in the region, including Nevada. Nevada has established BART emission limits in the draft SIP that fail to provide meaningful improvement in visibility conditions and that continue to show Nevada's emissions sources will "cause and contribute" to visibility impairment. These findings demonstrate that Nevada's draft regional haze SIP as written fails to meet its primary objective of providing the initial step toward meeting the national visibility goal.

NDEP Response:

This comment incorporates several of the previous NGO comments. NDEP has addressed comments regarding the under-representation of Nevada's emission inventory, Nevada's visibility impacts at Class I areas in adjacent states, and Nevada's BART determinations in our responses above. Again it appears that the NGOs are not well versed on the differences between the BART guidance and the RHR. Cause and contribute is only a criteria to determine whether a BART-eligible source will be subject to a full BART determination. Finally, Nevada deems our progress reasonable for all Class I areas, both those in adjacent states, as well as the Jarbidge Wilderness Area, as stated previously. Nevada projected 2018 reductions of anthropogenic emissions are proportional to our contributions to visibility impairment.

No changes were made to the RH SIP as a result of this comment.

NGO Comment 5:

5. There is an inadequate explanation in the RH SIP regarding why the mining and mine processing sites were not included in the RH SIP inventory. Please either include these sources in the RH inventory or explain why they were excluded.

NDEP Response:

As the Tech Review states in the last paragraph of page 5:

"Major industrial emissions inside and outside of Nevada were also considered when evaluating visibility conditions at Jarbidge. Within Nevada, major emission sources that could affect Jarbidge include the Valmy Station, a coal-fired EGU, along with major gold mines and other mineral operations in the state. **All of these emissions appear to be included in the WRAP emissions inventory relied upon by NDEP for the regional haze SIP.**" Emphasis added by NDEP.

Since the referenced emission sources are included in the RH SIP inventory as stated in Mr. Gebhart's Tech Review, this comment is spurious and no changes were made to the SIP based on this comment.