

**WYOMING'S  
LONG TERM STRATEGY  
FOR VISIBILITY PROTECTION  
2003 REVIEW REPORT**

**FINAL  
MAY 29, 2003**

**PREPARED BY  
WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION**

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# TABLE OF CONTENTS

1.	Introduction	1
1.1.	Background	1
1.2.	Long Term Strategy Review and Update	3
1.3.	Regional Haze Regulation	4
2.	Progress Toward National Goal	6
2.1.	Requirement I	6
2.2.	Requirement II	7
2.2.1.	New Source Review Program	7
2.2.1.1.	Oil and Gas Production	8
2.2.1.2.	Coal Bed Methane	9
2.2.1.3.	Best Available Control Technology	11
2.2.1.4.	New Source Review Permit Management	12
2.2.1.5.	Prevention of Significant Deterioration Permit Coordination	13
2.2.2.	Operating Permit Program	14
2.2.3.	Monitoring Program	15
2.2.3.1.	Wyoming Visibility Monitoring Network	15
2.2.3.2.	Ambient Air Monitoring	17
2.3.	Requirement III	18
2.4.	Requirement IV	22
2.5.	Requirement V	23
2.5.1.	Southwest Wyoming Technical Air Forum	23
2.5.1.1.	Conclusions	24
2.5.1.2.	Additional Analysis of Oil and Gas Development	25
2.5.1.3.	Additional Analysis	27
2.6.	Requirement VI	28
2.6.1.	Review of Impact from New or Modified Sources	28
2.6.2.	Emission Reductions Due to Ongoing Control Programs	30
2.6.3.	Smoke Management Techniques	30
2.6.3.1.	Smoke Management Guidance	30
2.6.3.2.	Smoke Management Program Development	32
2.6.4.	Other Factors Which Must Be Considered	33
2.6.5.	Adequacy of Long Term Strategy	33
3.	Provisions Not Addressed	33
4.	Emission Trends	34
4.1.	AIRS Actual Emissions Inventory	34
4.2.	AQDS Potential Emissions	35
4.3.	Northeast Wyoming NO <sub>x</sub> Inventory	36
4.4.	WRAP 1996 Emission Inventory	37

5.	Progress Toward 2000 Recommendations	38
5.1.	Regional Haze	38
5.2.	SWWYTAF Air Quality Modeling Project	39
5.3.	Additional Visibility Monitoring	40
5.4.	Smoke Management Program	41
6.	Public Notification and Meetings	41
7.	Review and Response to Comments	42
7.1.	Federal Land Manager Comments	43
7.2.	United States Environmental Protection Agency Comments	47
7.3.	Environmental Organization Comments	50
8.	Recommendations	54

#### Appendices

Appendix A	Wyoming Air Quality Standards and Regulations, Chapter 9 <u>Visibility Impairment/PM Fine Control</u>
Appendix B	Wyoming State Implementation Plan for Class I Visibility Protection
Appendix C	Process Documentation
Appendix D	Air Quality Advisory Board Meeting Minutes, April 22, 2003 - Afternoon Session: 1:30 PM
Appendix E	Visibility Monitoring Data Assessment
Appendix F	Southwest Wyoming Technical Air Forum
Appendix G	Emissions Data Assessment
Appendix H	Written Comments

## ABBREVIATIONS AND ACRONYMS

AAQTF	Agricultural Air Quality Task Force
AIRS	Aerometric Information Retrieval System
AQAB	Air Quality Advisory Board
AQDS	Air Quality Data System
AQRV	Air Quality Related Value
BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
b <sub>ext</sub>	Atmospheric Extinction
BLM	Bureau of Land Management
b <sub>ray</sub>	Rayleigh Scattering
b <sub>sp</sub>	Atmospheric Scattering
CAM	Compliance Assurance Monitoring
CASTNet	Clean Air Status and Trends Network
CBM	Coal Bed Methane
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DEQ	Wyoming Department of Environmental Quality
Division	Wyoming Department of Environmental Quality, Air Quality Division
dv	Deciview
EIS	Environmental Impact Statement
EPA	U. S. Environmental Protection Agency
FCC	Fluid Catalytic Cracker
FEJF	Fire Emissions Joint Forum
FIP	Federal Implementation Plan
FLM	Federal Land Manager
FR	Federal Register
f(RH)	Relative Humidity Correction Factor
GCVTC	Grand Canyon Visibility Transport Commission
GRBVS	Green River Basin Visibility Study
gm/hp-hr	grams per horsepower-hour
Guidance	Oil and Gas Industry Guidance Document
HAP	Hazardous Air Pollutant
HNO <sub>3</sub>	Nitric Acid
IMPROVE	Interagency Monitoring of Protected Visual Environments
Mm <sup>-1</sup>	Inverse Megameters
NAAQS	National Ambient Air Quality Standards
NADP	National Atmospheric Deposition Program
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NH <sub>3</sub>	Ammonia
NO	Nitric Oxide
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>3</sub>	Nitrate

NO <sub>x</sub>	Oxides of Nitrogen
NPS	National Park Service
NSR	New Source Review
O <sub>3</sub>	Ozone
PM <sub>2.5</sub>	Particulate Matter less than 2.5 microns
PM <sub>10</sub>	Particulate Matter less than 10 microns
PRB	Powder River Basin
PSD	Prevention of Significant Deterioration
QA	Quality Assurance
QC	Quality Control
RFP	Request for Proposal
Rule	Regional Haze Rule
Rx	Prescribed Fire
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO <sub>2</sub>	Sulfur Dioxide
SO <sub>4</sub>	Sulfate
SO <sub>x</sub>	Sulfur Oxides
SOA	Secondary Organic Aerosols
SVR	Standard Visual Range
SWWYTAF	Southwest Wyoming Technical Air Forum
TSP	Total Suspended Particulate
VOC	Volatile Organic Compound
WAQSR	Wyoming Air Quality Standards and Regulations
WOC	Wyoming Outdoor Council
WRAP	Western Regional Air Partnership

# 1. INTRODUCTION

## 1.1. BACKGROUND

The *Wyoming State Implementation Plan for Class I Visibility Protection* was effective as a State requirement on May 10, 1988, and was approved by the U.S. Environmental Protection Agency (EPA) by notice in the Federal Register on February 15, 1989, under 40 CFR Part 52, effective April 17, 1989.

Wyoming's Visibility State Implementation Plan (SIP) consists of two parts:

1. Chapter 9, Section 2 Visibility of the Wyoming Air Quality Standards and Regulations (WAQSR), is the regulation that provides for procedures to certify visibility impairment in Class I areas and requirements for emissions reductions from operating major stationary sources where such impairment can be reasonably attributed to a source or a small group of sources. Appendix A contains a copy of WAQSR Chapter 9.

Chapter 9, Section 2 also requires a review of applications for new major stationary sources and major modifications under WAQSR Chapter 6, Section 2 Permit requirements for construction, modification and operation and Chapter 6, Section 4 Prevention of significant deterioration to determine visibility impacts in Class I areas and provisions to review and revise, if appropriate, the Long Term Strategy for Visibility Protection.

2. The second part is the *Wyoming State Implementation Plan for Class I Visibility Protection*, which is included in Appendix B. The plan includes provisions for existing and new source review, and long term periodic review requirements in WAQSR Chapter 9, Section 2; Federal Land Manager (FLM) coordination, a monitoring strategy and a Long Term Strategy.

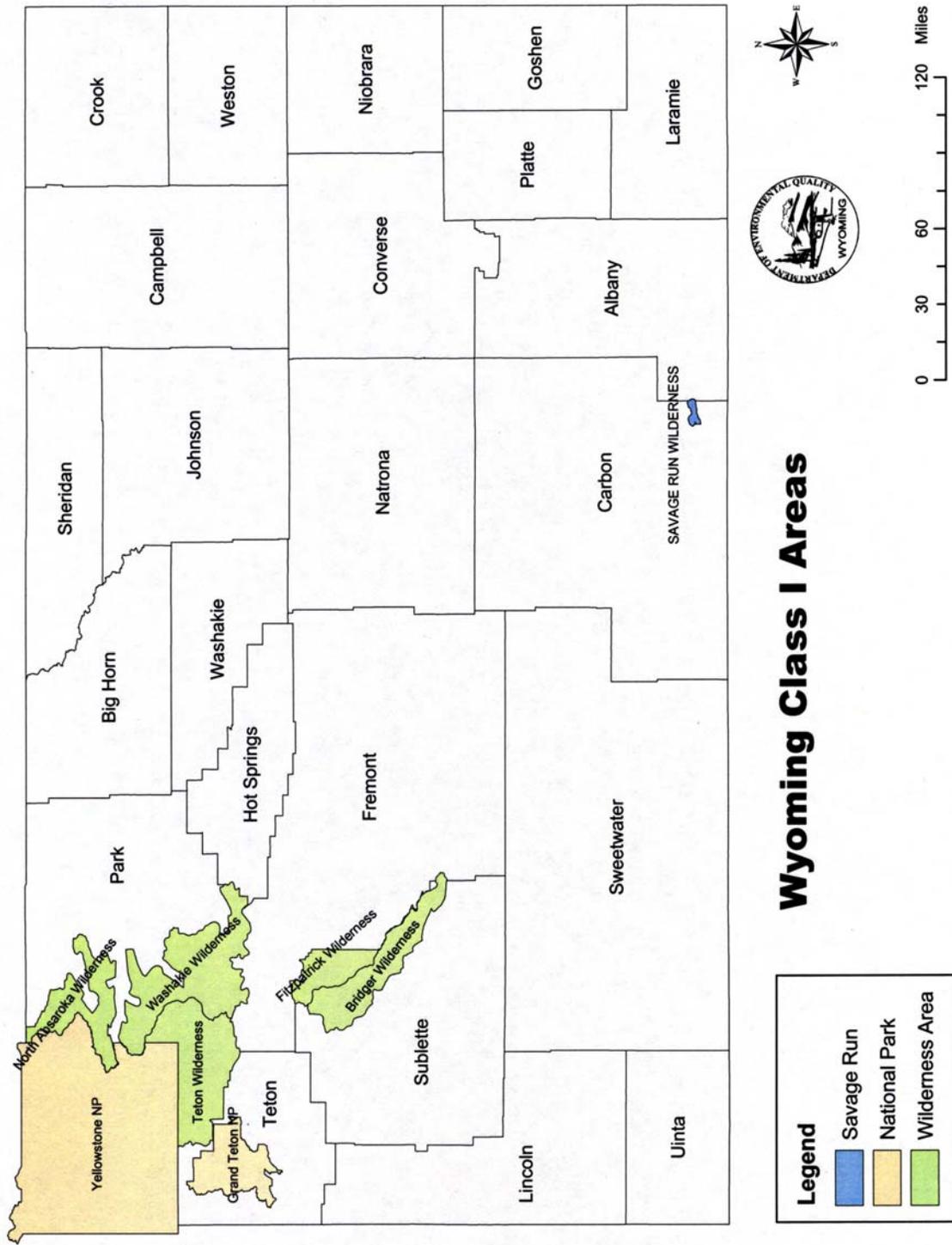
Class I area means, for the purposes of Wyoming's Visibility SIP and regulation, all mandatory Class I Federal Areas<sup>1</sup> established in the Clean Air Act Amendments of 1977 and the Savage Run Wilderness Area. Figure 1 is a map of Wyoming's Class I areas. Wyoming's seven mandatory Federal Class I areas include Yellowstone National Park, Grand Teton National Park, North Absaroka Wilderness Area, Washakie Wilderness Area, Teton Wilderness Area, Bridger Wilderness Area, and Fitzpatrick Wilderness Area.

Wyoming's eighth Class I area, Savage Run Wilderness Area, is a State Class I area in the Snowy Range of southeastern Wyoming. The Savage Run Wilderness Area was established as a wilderness area in February 1978 prior to the date of January 25, 1979 in WAQSR Chapter 6, Section 4(c) that designated areas as Class I. The first sentence of Chapter 6, Section 4(c) states "All national parks, national wilderness areas, and national memorial parks in Wyoming as of January 25, 1979, shall be designated as Class I and may not be redesignated."

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<sup>1</sup> 44 FR 69124, November 30, 1979.

Figure 1. Class I Areas in Wyoming



WAQSR Chapter 6, Section 4(d) describes the process for redesignating Class II areas to Class I areas. The redesignation process must be accomplished through the process of establishment of regulations and standards set forth in the Wyoming Environmental Quality Act. The person, or persons, petitioning the Wyoming Department of Environmental Quality or Wyoming Environmental Quality Council for a redesignation is responsible for preparing and submitting a description and analysis of the health, environmental, economic, social, and energy effects of the proposed redesignation, which would be made available to the public and local and county government for review and comment. Although there are provisions in Chapter 6, Section 4(d) for redesignation, no Class II areas in Wyoming have been redesignated to Class I status.

## **1.2. LONG TERM STRATEGY REVIEW AND UPDATE**

The *Wyoming State Implementation Plan for Class I Visibility Protection* states:

“Wyoming’s long term strategy will focus on the prevention of any future visibility impairment in Class I areas that can be attributed to a source or small group of sources as the Federal Land Managers have not identified any current impairment in the State’s Class I areas due to such sources.”

Therefore, the focus of the 2003 Long Term Strategy review and update is visibility impairment that is reasonably attributable to a single stationary source or small group of stationary sources. Reasonably attributable visibility impairment can be “[s]moke, colored gas plumes, or layered haze emitted from stacks which obscure the sky or horizon and are relatable to a single source or a small group of sources.”<sup>2</sup>

However, the State believes that this Long Term Strategy should recognize the general certification of visibility impairment due to uniform haze provided by the National Park Service, for all of its areas in the lower 48 states, to EPA in November of 1985. EPA regulations in 1985 focused on visibility impairment caused or contributed to by a stationary source or small group of stationary sources and did not require states to address uniform or regional haze in their SIPs. Regional haze is a widespread haze that is often caused by the long-range transport of pollutants over hundreds of miles from numerous stationary, mobile and area sources located over a broad geographic region. As discussed later in this report, in 1999 EPA promulgated Regional Haze Regulations that will require the states to address uniform or regional haze in Regional Haze SIPs, therefore addressing the National Park Service’s 1985 certification of visibility impairment due to uniform haze.

WAQSR Chapter 9, Section 2 regulations require the Wyoming Department of Environmental Quality, Air Quality Division (Division) to review and revise, if appropriate, the Long Term Strategy every three years and provide a report of its review on June 1<sup>st</sup> of the year of the review. Prior to the preparation of the review report, the regulation requires the Division to prepare a draft report and provide for public comment and the opportunity for a public hearing on the contents of this report through the issuance of a public notice. All public comments are to be considered in preparation of the final report. The regulations also provide that the Division consult with Federal Land Managers during the Long Term Strategy review. As has been

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<sup>2</sup> 45 FR 80085, December 2, 1980.

Division practice for past Long Term Strategy reviews, the Division held a public meeting before the Wyoming Air Quality Advisory Board on April 22, 2003 to provide the public with an opportunity to comment on the 2003 Draft Review Report and visibility protection from reasonably attributable visibility impairment in Class I areas. A Review and Report Schedule identifying the timeline of main tasks and meetings for the 2003 Long Term Strategy review is provided in Appendix C.

The regulations require the Long Term Strategy Review Report to include an assessment of:

- I. The progress achieved in remedying existing impairment of visibility in any Class I area;
- II. The ability of the Long Term Strategy to prevent future impairment of visibility in any Class I area;
- III. Any change in visibility since the last such report, including an assessment of existing conditions;
- IV. Additional measures, including the need for SIP revisions, that may be necessary to assure reasonable progress toward the national visibility goal;
- V. The progress achieved in implementing BART and meeting other schedules set forth in the Long Term Strategy; and
- VI. The progress achieved in developing the components of the strategy.

The Division acknowledges that the Wyoming Visibility SIP narrative reflects the situation in 1987, which is not reflective of today and thus differs from the discussions in this report. This report is a review and update of the Long Term Strategy and is intended to address any changes that have occurred since the preparation of the last review report<sup>3</sup>. This 2003 Review Report is not a rulemaking action and does not change the substantive elements under the SIP. At such time as a revision to the substantive elements of the SIP is necessary, the narrative portion of the SIP will be updated and a rulemaking action will be initiated.

### **1.3. REGIONAL HAZE REGULATION**

In 1980 when EPA promulgated regulations to address “reasonably attributable” visibility impairment<sup>4</sup>, they deferred action on regional haze regulations until monitoring, modeling, and scientific knowledge about the relationship between pollutants and visibility effects improved. A 1993 report by the National Academy of Sciences, *Protecting Visibility in National Parks and Wilderness Areas*<sup>5</sup>, concluded that “current scientific knowledge is adequate and control technologies are available for taking regulatory action to improve and protect visibility.” In

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<sup>3</sup> Wyoming Department of Environmental Quality, Air Quality Division, Wyoming’s Long Term Strategy for Visibility Protection 2000 Review Report, Final, May 30, 2000.

<sup>4</sup> 45 FR 80084, December 2, 1980.

<sup>5</sup> National Research Council Committee on Haze in National Parks and Wilderness Areas, *Protecting Visibility in National Parks and Wilderness Areas*, National Academy Press, 1993.

1991 the Grand Canyon Visibility Transport Commission (GCVTC) began to study regional haze visibility impairment, in 16 Class I areas on the Colorado Plateau, caused by all types of sources in nine western Transport Region States, including Wyoming. The GCVTC's final report<sup>6</sup> was submitted to EPA in 1996 and included significant technical analyses and broad-based consensus strategies to improve visibility.

On July 31, 1997, EPA published proposed amendments<sup>7</sup> to the 1980 regulations to set forth a program to address regional haze visibility impairment in mandatory Federal Class I areas. The EPA also published a notice of availability<sup>8</sup> of additional information on the proposed regional haze regulation on September 3, 1998. After considering public comment on the proposed regional haze regulation, EPA promulgated the Regional Haze Rule<sup>9</sup> (Rule) on July 1, 1999. Specific provisions are included in the Rule as Section 309, to allow nine western Transport Region States, one of which is Wyoming, to implement the recommendations of the GCVTC within the framework of the regional haze program. The remaining states must utilize the nationally applicable Section 308 provisions of the Rule.

A May 24, 2002 ruling by the U.S. Court of Appeals in Washington D.C.<sup>10</sup> upheld the overall structure of the Regional Haze Rule, including the long term goal to restore visibility to natural conditions while preventing degradation on the cleanest days, but found certain provisions of the Best Available Retrofit Technology (BART) requirements were an impermissible constraint on state authority. Specifically, the court said EPA could not require states to consider BART-eligible sources as a group when determining which sources to control and what technology to use. The court also expressed doubts as to the legality of the approach for coordinating the submittal of Regional Haze SIPs but refrained from deciding on this issue in light of the remand to EPA on the BART provisions.

The Regional Haze Rule requires states to develop long term strategies including enforceable measures designed to meet reasonable progress goals. States must establish goals and emission reduction strategies for each mandatory Federal Class I area to: improve visibility on the haziest days, and ensure no degradation occurs on the clearest days over the period of each implementation plan. Because regional haze in the contiguous United States is inherently a multi-state, regional problem, coordinated regional efforts are likely to represent the best approach to resolving visibility impacts due to regional haze. Therefore, EPA encourages states to work together in regional partnerships to develop and implement multi-state strategies to reduce emissions of visibility-impairing pollution.

The Regional Haze Rule only applies to mandatory Federal Class I areas. Therefore any redesignated Class I areas, tribal Class I areas, or state Class I areas are not specifically addressed by the Rule. However, due to the "regional" nature of regional haze visibility impairment, it is anticipated that visibility improvements at mandatory Federal Class I areas achieved due to the Rule will also be observed to some degree at other Class I areas as well as

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<sup>6</sup> Grand Canyon Visibility Transport Commission, Recommendations for Improving Western Vistas, Report to the U.S. EPA, June 10, 1996.

<sup>7</sup> 62 FR 41141, July 31, 1997.

<sup>8</sup> 63 FR 46952, September 3, 1998.

<sup>9</sup> 64 FR 35714, July 1, 1999.

<sup>10</sup> No. 99-1348, American Corn Growers Association, Petitioner v. Environmental Protection Agency, Respondent.

Class II areas. Now that the Regional Haze Rule has been promulgated, Wyoming will have to develop a plan and regulations to meet the requirements in the Rule and submit a Regional Haze SIP to EPA potentially as early as December 31, 2003 but no later than December 31, 2008, depending on the option chosen as required by the Rule. This process will be initiated in the near future and the Division suggests that proponents of visibility standards should become involved in the public process of adopting rules and developing the plan to address regional haze visibility impairment.

## **2. PROGRESS TOWARD NATIONAL GOAL**

Wyoming's Visibility regulation identifies six areas to be addressed in the report on progress toward the national visibility goal of remedying existing and preventing future impairment that can be attributed to a source or small group of sources. The following sections provide an assessment of each of those required areas.

### **2.1. REQUIREMENT I**

*The progress achieved in remedying existing impairment of visibility in any Class I area.*

Since adoption of Wyoming's Visibility SIP and Visibility regulation, neither the Federal Land Managers of any Class I area nor the Division has certified that visibility impairment, attributable to a source or small group of sources, exists in any Wyoming Class I area pursuant to provisions in Chapter 9, Section 2 of the WAQSR. Provisions for the protection from reasonably attributable visibility impairment in South Dakota's mandatory Federal Class I areas, Wind Cave National Park and Badlands Wilderness Area<sup>11</sup>, are part of a Federal Implementation Plan for the State of South Dakota as identified in 40 CFR 52.2179. EPA has not advised the State of Wyoming, as a result of any Long Term Strategy reviews EPA may have conducted for visibility protection for the Wind Cave National Park and Badlands Wilderness Area, that there is any potential attribution to Wyoming sources. As there has been no certification of reasonably attributable impairment by any agency at any Wyoming or South Dakota Class I area, there are no required emission reduction plans, which would require the installation of the Best Available Retrofit Technology (BART) to major operating stationary sources.

Chapter 9, Section 2 of the WAQSR requires that any certification of impairment be accompanied by an analysis and visibility data supported by visibility monitoring which may include visual observations or any other technique the Division deems appropriate. On the basis of what is required in the regulation, the Division does not believe it can certify impairment on the basis of human visual observations alone, which are anecdotal or empirical in nature.

Wyoming still points to a significant reduction in Sulfur Dioxide (SO<sub>2</sub>) emissions (approximately 45,000 tons) in southwest Wyoming during the period of 1985 to 1991 due to the installation of scrubbers on power plant stacks required by emission standards adopted in the 1974-1975 timeframe. These emission reductions can be seen on Aerometric Information Retrieval System

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<sup>11</sup> The U.S. Congress designated the Wilderness Area portion of Badlands National Park as a mandatory Federal Class I area.

(AIRS) trends graphs included in Appendix G that represent actual source emissions. These emission reductions had to have had a positive impact on visibility in nearby Class I areas but visibility monitoring does not reflect this improvement since monitoring did not begin until the control program was nearly complete.

## **2.2. REQUIREMENT II**

*The ability of the Long Term Strategy to prevent future impairment of visibility in any Class I area.*

The purpose of the Division's program is to protect the public health and welfare from the harmful effects of air pollution by implementing an aggressive program that includes:

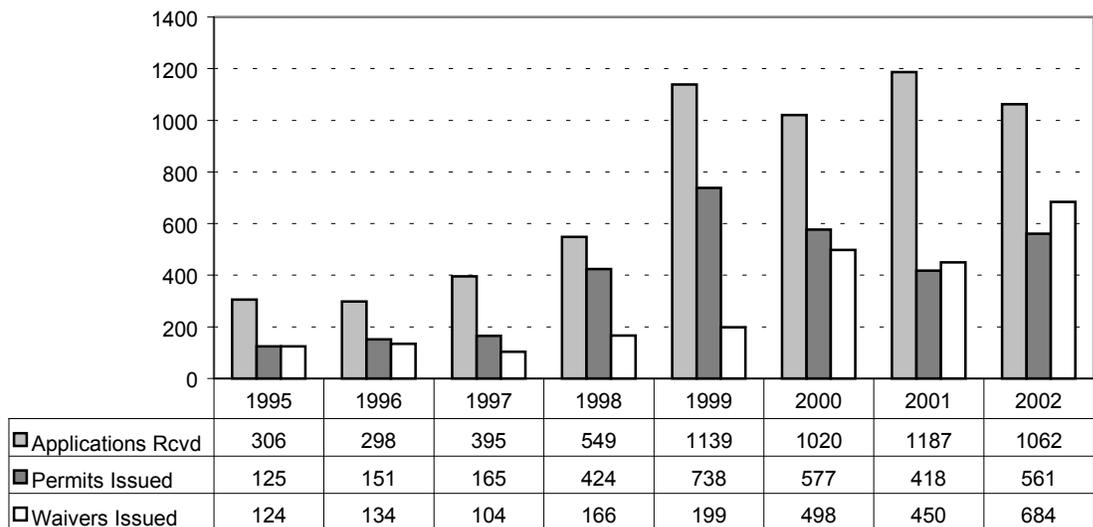
- The detailed review and issuance of initial construction permits for new emitting facilities or modification of existing facilities that incorporate current control technologies and mitigation measures.
- A source compliance activity that combines a detailed review of regulatory requirements, issuance of an operating permit, and on-site inspections to insure continuous compliance with permit terms.
- An air and emissions monitoring activity together with a detailed analysis of the measured results to continuously evaluate the success of the permitting and compliance efforts.
- A visibility monitoring program to quantify existing visibility conditions in the State.

In sum, these activities are taken to prevent, reduce and eliminate air pollution in order to preserve and enhance the air resource of the State for public, agricultural, industrial, recreational and other beneficial uses. The following sections focus on the major program areas that aid the Division's ability to prevent future impairment of visibility: New Source Review Program, Operating Permit Program, and Monitoring Program.

### **2.2.1. New Source Review Program**

The New Source Review (NSR) Program is a permit program for the construction of new sources and modification of existing sources as established by WAQSR Chapter 6, Section 2 Permit requirements for construction, modification and operation and Chapter 6, Section 4 Prevention of significant deterioration. The primary purpose of the NSR Program is to assure compliance with ambient standards set to protect public health, assure that Best Available Control Technology (BACT) is utilized to reduce and eliminate air pollution emissions, and to prevent deterioration of clean air areas. Any amount of air contaminant emissions from a facility subjects it to Wyoming's NSR Program.

Figure 2. New Source Review Permitting Program Activity



The bulk of the NSR Program activity depicted in Figure 2 is due to oil and gas production and coal bed methane development, which are discussed below. The remainder of the activity is attributed to facility types such as the trona industry, coal mines, power plants, gas plants, petroleum refineries, bentonite plants, asphalt plants and crushing and screening operations. With the current energy demands, the Division expects the minor source permitting load to continue to increase. The staffing level within the NSR Program has a direct effect on the number of permits and waivers issued within a given year.

The following discussions focus on areas of emission control and permit programs that are already underway and reflect the principal facility types; oil, gas, coal bed methane, and power production; being dealt with by the Division at this time within the NSR Program. While the emission control and permit programs discussed in the following section aid the Division's ability to prevent future impairment of visibility, the Division is not stating that oil, gas, coal bed methane, and power production sources cause or contribute to reasonably attributable visibility impairment.

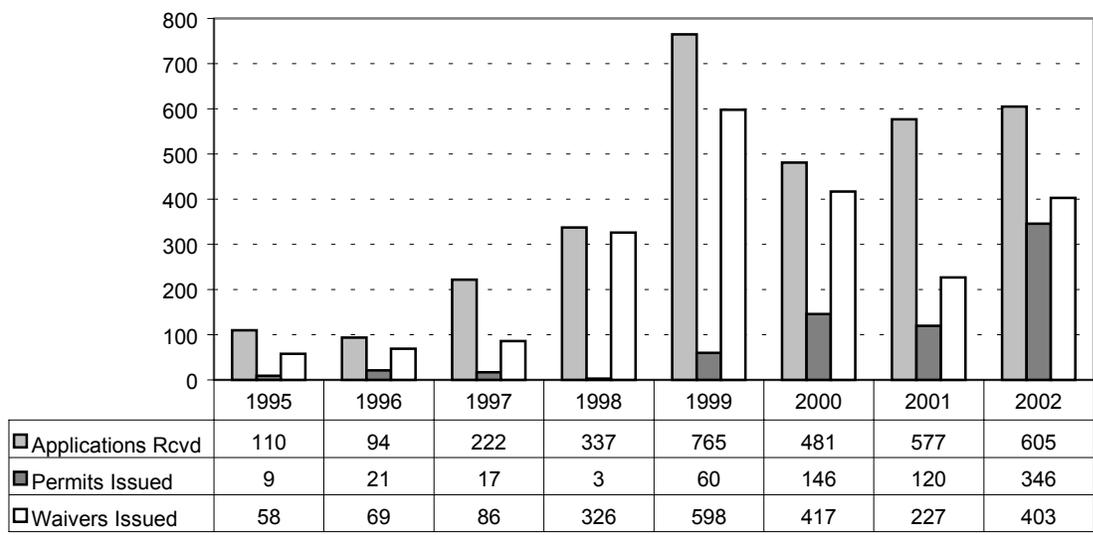
### 2.2.1.1. Oil and Gas Production

In October 1995, the Division initiated a program to ensure that all oil and gas production units in southwest Wyoming, as well as the entire State, that were constructed since May of 1974 (the effective date of Wyoming's NSR Permit Program) were permitted and that BACT is utilized to control or eliminate emissions from both major and minor sources. To guide oil and gas producers through the NSR permitting process, the Division developed an *Oil & Gas Industry Section 21 Guidance Document* (Guidance) that was released in June of 1997 and included simplified application forms and a detailed Notice of Installation process for new facilities.

The Guidance has been revised three times since it was originally released in June of 1997. The most recent revision took effect in August of 2001<sup>12</sup> and includes a “Presumptive BACT” process for the control of Volatile Organic Carbon (VOC) emissions associated with dehydration units at new facilities. The other major component of the Guidance provides a “Presumptive BACT” process for the control of VOC emissions associated with flashing losses from pressure vessels and storage tanks at new facilities. The “Presumptive BACT” processes result in more emissions being controlled earlier in the life of the well than the previously employed case-by-case BACT processes.

The NSR Program’s permitting activity associated with oil and gas production facilities is presented in Figure 3. The number of oil and gas permit applications received in 1995 and 1996 is related to the industry requesting issuance of a NSR permit to allow them to opt out of the Operating Permit Program. Since the issuance of the Guidance in 1997, the minor source permitting workload has continued to increase. The significant increase in 1999 is due to a January 1999 letter from the Division to all oil and gas producers announcing the November 1998 revised Guidance. Additional staff members have been added to the Division’s NSR Program since 1995 to assist in the review of oil and gas permit applications. This initiative has resulted in minimized emissions in southwest Wyoming, and the State as a whole, and will continue to do so due to the large number of applications the Division continues to receive for oil and gas production units.

Figure 3. Oil and Gas Production Permitting Activity



### 2.2.1.2. Coal Bed Methane

Coal bed methane (CBM) development in the Powder River Basin (PRB) of northeast Wyoming has increased dramatically since 1998. CBM wells are shallow wells that extract methane from the coal seam at a very low pressure. CBM development is compression intensive because the

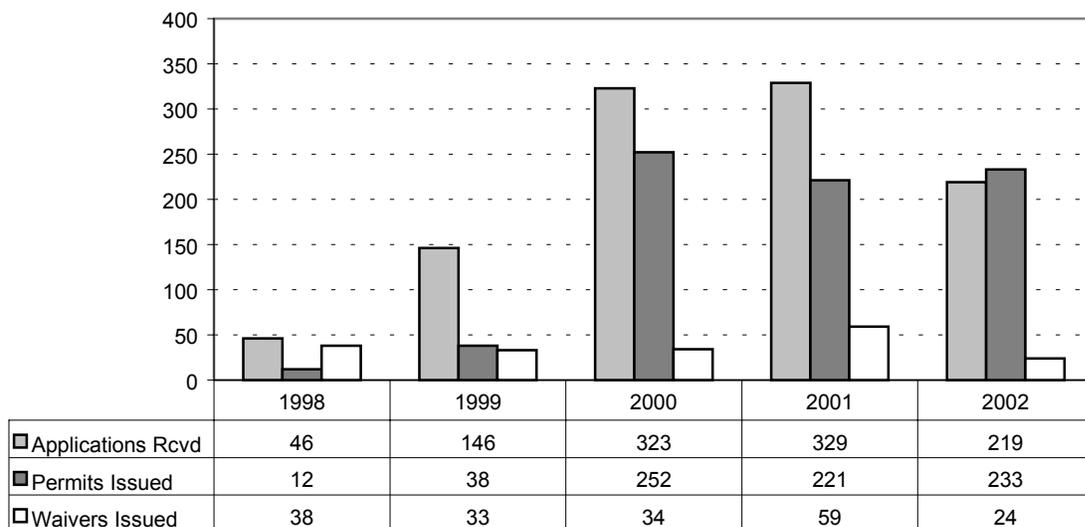
<sup>12</sup> Wyoming Department of Environmental Quality Air Quality Division, Oil and Gas Production Facilities Chapter 6, Section 2 Permitting Guidance, revised August 2001.

methane must be compressed from low wellhead pressure to high pipeline pressure to facilitate the transport and introduction of the methane into the transmission pipeline. A typical production pod consists of about ten wells, pod gas gathering lines, and a pod compressor station consisting of one to six 380 horsepower compressor engines. Methane from several pod compressor stations is brought into a field compressor station, typically one to three 1,000 horsepower compressor engines, to increase the pressure and introduce the methane into the transmission pipeline. Once the methane has entered the transmission pipeline additional pipeline compressor stations, typically two to six 2,000 horsepower compressor engines, are required to maintain the pipeline pressure and move the methane to market.

Prior to construction, a company must submit an application for each CBM compressor station to Wyoming’s NSR Program for review and permit issuance. By application of minor source BACT, the Division has required controls of Oxides of Nitrogen (NO<sub>x</sub>) and Formaldehyde on compressor engines associated with CBM development. In addition to CBM development in northeast Wyoming, CBM development opportunities are also being explored in the southern portion of the State. This initiative has resulted in minimized emissions in northeast Wyoming, and the State as a whole, and will continue to do so due to the large number of applications the Division continues to receive for CBM compressor engines.

Figure 4 depicts the direct increase in minor source permitting activity within the NSR Program as a result of the CBM development activity. Additional staff members have been added to the Division’s NSR Program since 1999 to assist in the review of CBM permit applications.

Figure 4. Coal Bed Methane Permitting Activity



### 2.2.1.3. Best Available Control Technology

Due to a desire to maintain and improve Wyoming's air quality, the Best Available Control Technology (BACT) process is applied statewide to new sources, both major sources and minor sources, under the Wyoming NSR Program's permitting process<sup>13</sup>. The BACT process is most appropriately defined as the elimination of pollutants from being emitted into the air whenever technically and economically feasible to do so. By application of minor source BACT, the Division has required controls of NO<sub>x</sub> and Formaldehyde in the CBM development and controls of NO<sub>x</sub>, VOC and Hazardous Air Pollutant (HAP) emissions in the oil and gas production development. While the Division takes the State and Federal-required BACT review in the Prevention of Significant Deterioration (PSD) permitting actions seriously, the Division takes the State-required BACT review in minor source permitting actions equally as seriously, as the bulk of the Division's workload is made up of minor sources.

As an example of the Division's application of BACT in the minor source permitting program, over the years, the Division had accepted 2 grams per horsepower-hour (gm/hp-hr) NO<sub>x</sub> as representing BACT for compressor engines. In early 1998, it became apparent to the Division that control technologies had vastly improved over the years based on permitting actions where the NO<sub>x</sub> emission levels submitted by the applicant were less than 2 gm/hp-hr and were accepted as representing BACT. Permitting actions since early 1998 have shown that it is technically feasible to operate at reduced emission levels; therefore the Division has been requiring controls for NO<sub>x</sub> emissions levels through the application of BACT to between 1.5 and 0.7 gm/hp-hr, depending on engine type. The Division has determined that the cost effectiveness values (i.e., dollars per ton of pollutant emission reduced) for the 1.5 to 0.7 gm/hp-hr control options, depending on engine type, are not disproportionately high when compared to the costs incurred in BACT determinations for NO<sub>x</sub> at other source types.

Black Hills Corporation was issued a PSD construction permit (CT-3030) in September 2002 to construct a 500 megawatt pulverized coal fired electric generating facility known as WYGEN 2. During the Division's permit application review and analysis, BACT analyses were performed for all regulated pollutants emitted in significant amounts. The following BACT determinations for NO<sub>x</sub>, SO<sub>2</sub>, Particulate Matter (PM/PM<sub>10</sub>), Carbon Monoxide (CO), and VOC are listed below as an example of the Division's application of BACT in the PSD permitting program. As a result of the BACT determinations, the emissions limits established for WYGEN 2 in Permit CT-3030 are lower than any permitted limits the Division has found for a pulverized coal fired electrical generating facility in the United States, as of September 2002.

NO<sub>x</sub> – Low NO<sub>x</sub> burners and selective catalytic reduction with an emission limit of 0.07 lb/MMBtu (30 day rolling average) represent BACT.

SO<sub>2</sub> – Semi-dry lime spray absorber with an emission limits of 0.10 lb/MMBtu (30 day rolling average) and 0.15 lb/MMBtu (3 hour block) represents BACT.

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<sup>13</sup> Some sources within Wyoming predate air quality permitting programs and as a result are not required to apply BACT in controlling process emissions. However, upon modification or expansion of a "grand-fathered" facility the portion of the facility that is to be modified or expanded would be required to utilize BACT in controlling process emissions.

PM/PM<sub>10</sub> – Fabric filters with an emission limit of 0.012 lb/MMBtu represents BACT.

CO and VOC – Good combustion controls with an emission limit of 0.15 lb/MMBtu for CO and an emission limit of 0.01 lb/MMBtu for VOC represents BACT.

The Division will continue to review BACT considerations on each source type and size on a case-by-case basis with consideration to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the proposed facility. The application of BACT in the minor source and PSD permitting programs has resulted in minimized emissions in the State as a whole and will continue to do so as the Division continues to receive NSR permit applications for new and modified sources.

#### **2.2.1.4. New Source Review Permit Management**

Every NSR permit issued by the Division contains the following permit condition:

“The permit shall become invalid if construction or modification is not commenced within 24 months of the date of permit issuance or if construction is discontinued for a period of 24 months or more in accordance with Chapter 6, Section 2(h) of the WAQSR. The Administrator may extend such time period(s) upon a satisfactory showing that an extension is justified.”

In addition, NSR permit conditions also require the permittee to notify the Division of commencement of construction, anticipated date of initial startup, and actual date of initial startup. In managing the State’s clean air resources and evaluating the ambient impact of any new facility, the Division must consider the cumulative impact of all permitted sources in an area whether constructed or not. Therefore, in an effort to more effectively manage NSR permits, the Division has initiated a permit management effort to monitor NSR permit status after permit issuance. This permit management effort should insure that permitted control strategies remain current and that those permits for which no action has been taken are removed from the permitted source inventory.

As part of the permit management effort, every three to four months NSR Program staff review the status of NSR permits where the permittee has not submitted a notification of startup. During the NSR permit status review, the NSR Program staff determine if construction has commenced and to what degree. For facilities that have not yet begun construction or modification within 24 months of permit issuance, the permittee may request a permit extension. Requests for permit extensions are evaluated on a case-by-case at the Division Administrator’s discretion and may include consideration of such factors as events beyond the control of the permittee; competition for, and management of, the air resource in the area; technological and economic advances in terms of control strategies for the specific source type; and the like. In instances where construction or modification has not commenced within 24 months of permit issuance and a permit extension has not been requested or approved, the Division will send a letter to the permittee notifying them of the expiration of the permit.

When the Division receives a request for a permit modification, the NSR staff review the construction and compliance status of the emission sources permitted at the facility during the permit application review. At the present time, the primary focus of these reviews is for coal bed methane development permitting. These reviews support the work of the Division's Compliance Program to assure the review of the facility's compliance status.

#### **2.2.1.5. Prevention of Significant Deterioration Permit Coordination**

The WAQSR requirements for permit review are found at Chapter 6, Section 2(g) and are applicable regardless of source size. The Division must notify the applicant within 30 days as to whether the application is complete. For complex major sources, this "completeness" process may be quite lengthy and include communication with the applicant by telephone, e-mail, and formal correspondence. Following a determination of completeness, the Division is required to reach a decision and publish that decision in a notice to the public within 60 days of the completeness determination. The public notice is for a period of 30 days and includes the opportunity to request a public hearing.

On average, the Division receives between four and six PSD permit applications per year. In these cases, the Division is cognizant of the "affirmative responsibility" of the FLMs to review the proposed project for potential impacts to areas under their management responsibilities and to provide comments for consideration in the final permitting decision. Per the requirements of 40 CFR 50.307 and the WAQSR Chapter 6, Section 2(n)(ii), the Division begins the process of notifying the appropriate FLM of the potential for a new or modified major source<sup>14</sup> in advance of receipt of a formal application. The process of notifying the appropriate FLM usually consists of a pre-application meeting between representatives for the applicant, Division, and FLM as well as the opportunity to review and provide comments on the applicant's proposed modeling protocol. Upon receipt of a formal permit application, the Division notifies the appropriate FLM that an application has been received and includes a complete copy of the application submitted to the Division per WAQSR Chapter 6, Section 2(n)(i). See Section 2.6.1 of this report for a complete description of the Review of Impact from New or Modified PSD Sources.

Recognizing that the "completeness" process has a somewhat open-ended timeline for complex major sources, the Division acknowledges that, although not required by regulation, formal notification to the appropriate FLM when a completeness determination is made by the Division would be helpful to the process as an indication to the FLM of when the 60 day review cycle prior to public notice begins. In all future PSD evaluations, the Division will notify the appropriate FLM that an application has been deemed complete and a complete copy of any additional information received from the applicant during the "completeness" process will be provided to the FLM.

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<sup>14</sup> Facilities subject to PSD permitting within 100 kilometers of a Class I area and some larger sources at distances greater than 100 kilometers (e.g., Black Hills Corporation's WYGEN 2 powerplant approximately 180 and 200 kilometers from Wind Cave National Park and Badlands National Park, respectively), as determined at the discretion of the Division Administrator.

Upon completion of the 60-day review cycle, the Division notifies the applicant, FLM, and EPA of the Division's intent to publish the Division's decision in a notice to the public. The notification also includes the Division's analysis and proposed permit conditions. At the close of the 30-day public comment period and after a public hearing, if one is requested, the Division analyses the comments received to arrive at a final decision on the permit application. Upon reaching a final decision, the Division issues a permit and provides copies of the permit to the applicant, FLM, and EPA.

### **2.2.2. Operating Permit Program**

The Operating Permit Program is a Title V requirement of the Clean Air Act Amendments of 1990, which was implemented by the State in early 1995. This is a permitting program for all major sources of air pollution<sup>15</sup> including major sources of hazardous air pollution<sup>16</sup>, as established by WAQSR Chapter 6, Section 3 Operating permits. The Operating Permit Program requires major sources (Title V sources) to submit an application and receive a permit for continued operation through development of a State and Federally enforceable permit that incorporates all State and Federal regulatory requirements. These permits are issued for a term of five years and must be renewed and updated to incorporate current regulatory requirements.

Since the Operating Permit Program was implemented in 1995, 197 applications have been submitted to the Division. Some of the submitted applications have never resulted in the issuance of an operating permit due to a variety of factors, including but not limited to, an incorrect determination of applicability, facility modification to become a synthetic minor, and shutdown of the facility. The number of Title V sources within the State is highly variable but has typically ranged from 150 to 160 sources at any given time.

As of March 10, 2003, there were 145 Title V sources within the State of Wyoming and only six of those sources have not been issued an operating permit. Of the six permits that have not been issued, three are new facilities that are just beginning the permitting process, two are in the final stages of the permitting process, and one will no longer be a Title V source upon issuance of a NSR permit. In June of 2001, the Operating Permit Program staff began work on renewal permits and has since issued 56 permit renewals. At the present time, the Operating Permit Program staff are working on 48 active applications that are broken down as follows: 32 renewal permits, ten significant modifications, and six permits that have not been issued, as described previously.

On December 8, 2000 WAQSR Chapter 6, Section 3 Operating permits was revised to incorporate compliance assurance monitoring (CAM). CAM is intended to provide a reasonable assurance of compliance with applicable requirements under the Clean Air Act for large emission units that rely on pollution control device equipment to achieve compliance. Monitoring is conducted to determine that control devices, once installed or otherwise employed, are properly operated and maintained so that they continue to achieve a level of control that complies with applicable requirements. The Division is addressing the complex implementation

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<sup>15</sup> Potential to emit 100 tons per year or more of a regulated pollutant.

<sup>16</sup> Potential to emit 10 tons per year or more of a hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.

of CAM in renewals, significant modifications and new permits, as applicable. The implementation of CAM will result in documenting continued operation of control devices, within ranges of specified indicators of performance, that are designed to provide reasonable assurance of compliance with applicable requirements.

### **2.2.3. Monitoring Program**

The Monitoring Program is mainly an ambient air monitoring program operated on a Statewide basis to continually evaluate the quality of Wyoming's ambient air (i.e., that to which the general public is exposed) based on measured results from the State operated monitoring network as well as several industry-operated networks. In addition to the ambient monitoring aspect of the program, the Monitoring Program also addresses visibility monitoring to quantify existing visibility conditions at selected sites in the State by monitoring the extent, frequency of occurrence, and magnitude of pollutants that result in impacts to general air quality, visibility, and other Air Quality Related Values.

#### **2.2.3.1. Wyoming Visibility Monitoring Network**

The State of Wyoming has implemented a number of initiatives to address visibility issues within the State directed at developing a database of qualified monitoring data upon which to base future decisions necessary to preserve and protect the air resource. This effort began in the mid 1990s in response to citizen concerns that visibility in the Green River/Ham's Fork Basin, a Class II area in southwest Wyoming, was being degraded as a result of industrial activity in the area. Most, if not all, of the citizen concerns were based on anecdotal perceptions of the "way it used to be", but there was little data available upon which to base sound conclusions and future planning. As a result, the Green River Basin Visibility Steering Committee was formed to fund and oversee a scientifically defensible study to characterize the current status of visual air quality in the Green River Basin.

The Green River Basin Visibility Study (GRBVS) was successful at documenting existing visibility conditions within the Green River/Ham's Fork Basin in southwest Wyoming. As a result of that effort, there now exists four years of monitored data including visual characteristics (automatic camera), optical properties of the atmosphere (transmissometer and nephelometer), aerosol characteristics (composition, concentration and size) and meteorology. Additionally, two years into the GRBVS, gaseous monitors to measure the ambient concentrations of Ozone and Oxides of Nitrogen were added to the suite of instrumentation at the site. Active visibility monitoring at the GRBVS site was discontinued on September 30, 2000 as it was determined that the data acquired over four years represents the necessary baseline data to characterize visual air quality in the Green River/Ham's Fork Basin. The gaseous monitors and the meteorological monitoring equipment remained operational until December 31, 2001.

The success of the GRBVS in southwest Wyoming and interest in visibility issues in other areas of the State prompted the Division to establish a Wyoming Visibility Monitoring Network to more fully understand regional haze visibility impairment. The primary focus for data obtained from the Wyoming Visibility Monitoring Network is to provide for "reality checks" to compare against as we, collectively, exercise complex air quality modeling tools of indeterminate

accuracy to evaluate PSD actions, conduct Federal National Environmental Policy Act (NEPA) actions, and evaluate the potential effectiveness of control strategies in reducing visibility impacts.

As part of the Wyoming Visibility Monitoring Network, a monitoring study has been initiated in northeast Wyoming that collects aerosol, optical, scene, meteorological, and gaseous data. Study results will be a valuable asset in making future decisions about air quality in the region, and will be useful in developing Wyoming's Regional Haze SIP. The Division established two visibility monitoring stations at two Class II areas in Wyoming near the Cloud Peak Wilderness Area (established February 2001) and at the Thunder Basin National Grasslands (established May 2001). Data collected at the stations will be utilized to characterize the extent, frequency of occurrence, and magnitude of visual air quality. Both stations collect aerosol, optical, scene, and meteorological data; Thunder Basin also collects gaseous data. Existing conditions are being documented by measuring the following five parameters:

- Aerosol characteristics (concentration, composition, and size) to determine the relationship between atmospheric optical properties and responsible pollutants.
- Optical properties of the atmosphere (continuously monitoring the atmospheric extinction and scattering coefficients), using a transmissometer and ambient nephelometer, respectively.
- Scene characteristics (documenting visual or scene-specific visibility) using an automatic digital camera system.
- Meteorology (temperature, relative humidity, wind speed, and wind direction) to understand local atmospheric conditions.
- Gaseous (ambient concentrations of Ozone (O<sub>3</sub>) and NO<sub>x</sub>) to document the magnitude and dynamics of these regulated pollutants.

To ensure data comparability to the Interagency Monitoring of Protected Visual Environments (IMPROVE) monitoring network and the long term operation of the station's aerosol monitors, the Division requested that they be designated as IMPROVE Protocol sites. Recognizing the value of the Cloud Peak and Thunder Basin stations to the national visibility monitoring effort, the IMPROVE Steering Committee approved the incorporation of the stations into the IMPROVE network. With the installation of the version II IMPROVE aerosol samplers in June 2002, the sites became two of the latest additions to the network of aerosol monitors that operate in the IMPROVE Program. The data collected at these two sites should greatly add to the expanding IMPROVE monitoring network to fill the existing data gap between the IMPROVE sites in northwestern Wyoming and southwestern South Dakota.

Although the nephelometers, transmissometers, and automatic cameras at the Cloud Peak and Thunder Basin stations are not a part of the IMPROVE network, the primary guidance for the optical and scene instrumentation is the protocols established by the IMPROVE Program. Aside from IMPROVE, there are no other widely accepted visibility protocols in common use. The

primary guidance for meteorological instrumentation, O<sub>3</sub>, and NO<sub>x</sub>, will be the EPA protocols that are well established and used for all regulatory applications.

Although the Cloud Peak and Thunder Basin stations are not located in areas classified as Class I, the collected data will be comparable to monitoring data currently collected in the State's Class I areas. This includes extensive IMPROVE data collected since 1988, and GRBVS data collected between 1996 and 2000. Additionally, collected data will help scientists determine the types and concentrations of air pollutants and their direction of travel. Scientists can then determine the extent and reach of pollutants, develop air quality models, and project visibility impacts at Class I areas.

In the near future, the Wyoming Visibility Monitoring Network will be supplemented by the development of a website to allow public access to monitored visibility and concurrent corresponding air quality conditions. With the transition to Starband satellite communication systems at the Cloud Peak and Thunder Basin stations, the Division has the capability to create a website that will be updated every 15 minutes with camera images from the high-resolution digital camera systems and accompanying visibility and air quality data.

### **2.2.3.2. Ambient Air Monitoring**

The major goal of the Division's Ambient Air Monitoring Network has been to determine what amount of a particular pollutant the general public is being exposed to. Although there are two types or designations that can be assigned an ambient air monitoring station, State and Local Air Monitoring Stations (SLAMS) and Special Purpose Monitors, the Division is never entirely certain when a new site is established or a new monitor is installed how the data might be used. As a result, all monitoring conducted by the Division follows the same requirements that have been established for a similar type SLAMS designated site.

The bulk of the Division's Ambient Air Monitoring Network is based on the monitoring of particulate matter in the form of Total Suspended Particulate (TSP), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), and particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>). Implementation of the new National Ambient Air Quality Standard (NAAQS) for particulate matter has required the Division to deploy a new monitoring network for fine particulate matter and begin operations. The Division began deployment and operation of PM<sub>2.5</sub> samplers in January 1999. PM<sub>2.5</sub> samplers were placed in Cheyenne, Jackson, Lander, and Sheridan and augment the PM<sub>10</sub> and TSP network of samplers in Casper, Cheyenne, Cody, Gillette, Jackson (no TSP), Lander (no TSP), Laramie, Rock Springs, and Sheridan. IMPROVE and/or IMPROVE Protocol sites can be used by the Division, as approved by EPA, for use as background indicators of PM<sub>2.5</sub> and can be used by the State for this portion of the PM<sub>2.5</sub> network. They cannot, however, be used for NAAQS determinations.

The Division has established a cooperative venture with the coal mining companies in the Powder River Basin (PRB) to operate two PRB-wide monitoring efforts. The mining industry committed to the funding and the majority of the equipment, while the Division insures the data meets all requirements as qualified data.

One effort has been to establish a fine particulate ambient monitoring network to determine, among other things, the spatial and temporal distribution of PM<sub>2.5</sub> in the ambient air in the PRB coal mining region. The PRB PM<sub>2.5</sub> network has been operating since 1999 as part of an Abandoned Coal Mine Lands Research Project that came to a close in April of 2002. The PRB PM<sub>2.5</sub> network consists of five monitors at the following locations: Antelope, Belle Ayr, Black Thunder, and Buckskin coal mines. To most efficiently maintain and continue the operation of the existing PRB PM<sub>2.5</sub> network, the coal mines transferred the ownership of the monitors to the State and the Division is operating the monitors as part of the statewide PM<sub>2.5</sub> network for the long term.

The second effort is a regional NO<sub>x</sub> ambient monitoring network that spans the length of the PRB from north to south, complimented by the gaseous NO<sub>x</sub> monitor at the Thunder Basin station. The regional NO<sub>x</sub> network consists of three monitors at three of the four PRB PM<sub>2.5</sub> network monitor locations: Antelope, Belle Ayr, and Black Thunder coal mines. This network was completely operational in early 2001 for the purposes of characterizing regional Nitrogen Dioxide (NO<sub>2</sub>) concentrations and demonstrating compliance with the NAAQS. The Division is currently in negotiation with the mining industry for continuation of this monitoring effort over the long term because of concerns over potential NO<sub>x</sub> impacts in the PRB.

As a result of concerns expressed during the development of the Powder River Basin Oil and Gas Environmental Impact Statement<sup>17</sup> (EIS), the Division established two additional PM<sub>10</sub> monitoring sites in the PRB in the communities of Arvada and Wright. These two PM<sub>10</sub> monitoring sites were operational in November of 2002 and will characterize the general air quality in CBM development areas in the PRB.

The gaseous monitors and the meteorological stations from the GRBVS site were originally envisioned to be relocated to the Cloud Peak station. However, the Division has determined it to be more appropriate to locate this equipment to an area in which the general air quality impacts due to CBM development in northeastern Wyoming can be monitored. A contract has been issued to establish and operate a monitoring station to characterize the general air quality and meteorological conditions in a CBM development area in Campbell County. The monitoring station will consist of ambient air (O<sub>3</sub>, NO<sub>x</sub>, and PM<sub>10</sub>) and meteorological data collection equipment. The contractor has identified a site location in Campbell County approximately 15 miles south of Gillette and is currently in the process of installing the air quality monitoring station.

### **2.3. REQUIREMENT III**

*Any change in visibility since the last such report, including an assessment of existing conditions.*

Only recently has the IMPROVE network matured to a point where long term trends of the cleanest, average, and haziest ambient aerosol concentrations and reconstructed extinction can be assessed. Trends characterized by IMPROVE based on 11 years of data (i.e., 1988 – 1998) are

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<sup>17</sup> Bureau of Land Management, U.S. Department of Interior, Final Environmental Impact Statement for Proposed Plan Amendment for the Powder River Basin Oil and Gas Project, Buffalo Field Office, January 2003.

presented in Appendix E. Several conclusions can be drawn from the Division's review of these long term trends for the Yellowstone National Park and Bridger Wilderness Area sites.

- At Yellowstone, visibility is improving on the cleanest days but no significant change is recorded on the haziest days. At Bridger, no significant change in visibility is recorded for the cleanest and haziest days.
- Sulfate aerosol concentrations are decreasing at a statistically significant rate at both Yellowstone and Bridger on both the cleanest and haziest days.
- Organic aerosol concentrations are increasing at varying statistically significant rates at both Yellowstone and Bridger due primarily to two high fire activity years in 1994 and 1996. On the cleanest days, organic aerosol concentrations are decreasing at a statistically significant rate at Yellowstone, while at Bridger no change was recorded.
- On the cleanest days, fine soil aerosol concentrations are decreasing at a statistically significant rate at Bridger and no change was recorded at Yellowstone. While on the haziest days, fine soil aerosol concentrations are decreasing at a statistically significant rate at Bridger and at Yellowstone no change was recorded.
- At Bridger, coarse mass aerosol concentrations are decreasing at a statistically significant rate on the haziest days, while no change was recorded on the cleanest days. At Yellowstone, there is no recorded change for the coarse mass aerosol concentrations on the haziest days but there is a statistically significant increase in the concentrations on the cleanest days.
- At Badlands National Park in South Dakota, visibility is improving on the cleanest days but no significant change is recorded on the haziest days.

A detailed review of visibility monitoring data collected with aerosol samplers, 1989 through 2001, at the Wyoming IMPROVE sites (i.e., Bridger Wilderness Area, Brooklyn Lake, North Absaroka Wilderness Area, Yellowstone National Park) is provided in Appendix E. Several conclusions can be drawn from the Division's data review.

- Monitoring has consistently shown better visibility at Bridger than at Yellowstone. With limited data available, visibility conditions at the North Absaroka and Brooklyn Lake sites is consistent with the magnitude of visibility conditions at the Bridger and Yellowstone sites.
- The inter-annual variation at Bridger and Yellowstone ranges from no change to as much as a three deciview increase or four deciview decrease. This inter-annual variability can be affected by factors such as meteorological conditions and high wildfire activity, which makes the assessment of a definitive visibility trend over a short term period (e.g., three years) very difficult.

- The three years of visibility monitoring data that have become available since the 2000 Review Report indicate that the 1999, 2000, and 2001 visibility conditions are lower than or equal to those monitored in 1998 at Bridger and Yellowstone for the cleanest, average, and haziest conditions, with the exception of the haziest condition at Yellowstone. For the haziest condition at Yellowstone, visibility decreased from 1998 to 1999 and then increased in 2000 and 2001 to levels greater than those monitored in 1998.
- The visibility monitoring data that has become available since the 2000 Review Report at Yellowstone demonstrates that visibility for the cleanest condition hits the lowest level monitored to date in 1999 and three of the four lowest levels monitored to date occur in 1999, 2000 and 2001 for the cleanest and average conditions.
- On the cleanest days in 2001, the ammonium sulfate aerosol has the greatest impact on visibility at all Wyoming IMPROVE sites. The ammonium sulfate and organic carbon aerosols have the greatest impact to visibility on the haziest days in 2001, but the dominant aerosol varies by site. In 2001, the fine soil aerosol has the least impact on visibility on the cleanest and haziest days at all four sites.
- Ammonium sulfate aerosol concentrations are well above ammonium nitrate aerosol concentrations measured at all Wyoming IMPROVE sites in 2001.
- Emission inventories indicate that NO<sub>x</sub> and SO<sub>2</sub> actual emissions from major stationary sources in Wyoming are approximately equal. The Division concludes from the emission inventories, aerosol concentrations, and reconstructed extinction budgets that NO<sub>x</sub> emissions have a significantly smaller impact on visibility than SO<sub>2</sub> emissions.
- Organic carbon aerosols are the least understood of the aerosol contributions to visibility impairment in terms of source attribution. Sources of the organic carbon emissions include natural and prescribed fires, residential fuel combustion, mobile sources, petroleum production and processing, and biogenic emissions (produced by vegetation).
- All Wyoming IMPROVE sites are subject to impacts from long range transport of visibility impairing aerosols.

The Visibility Monitoring Data Assessment in Appendix E compares the Wyoming IMPROVE aerosol data to corresponding IMPROVE aerosol data collected in Nevada, Utah, Colorado and South Dakota from 1989 through 2001. The conclusions drawn from the Division's review of this data are summarized below.

- Bridger Wilderness Area and Jarbidge Wilderness Area have had and continue to have the best visibility in the region.

- The three years of visibility monitoring data that have become available since the 2000 Review Report reveal that the lowest levels monitored to date for the cleanest condition occurred in 1999 at Yellowstone National Park, 2000 at Canyonlands National Park and Jarbidge Wilderness Area, and 2001 at Rocky Mountain National Park. For the average condition, the lowest levels monitored to date occurred in 1999 at Badlands and Rocky Mountain National Parks and 2000 at Canyonlands National Park and Jarbidge Wilderness Area. The highest levels monitored to date for the haziest condition occurred in 2000 at Rocky Mountain National Park and Mount Zirkel Wilderness Area.
- The visibility monitoring data that has become available since the 2000 Review Report indicate that the 1999, 2000, and 2001 visibility conditions are lower than or equal to those monitored in 1998 among all sites for the cleanest and average conditions, except the sites that commenced monitoring after 1998. For the haziest condition, 1999, 2000, and 2001 visibility conditions are lower than or equal to those monitored in 1998 at Badlands and Canyonlands National Parks and Bridger Wilderness Area.
- The total reconstructed extinction budgets on the cleanest days in 2001 show similar aerosol extinction characteristics among the sites, with an average of 35% of the total extinction attributed to visibility impairing aerosols. The aerosol extinction characteristics become more distinct between the sites on the average and haziest days in 2001, particularly with regard to the Badlands and Wind Cave National Park sites in South Dakota.
- On the cleanest, average, and haziest days in 2001, the visibility conditions among all sites vary by 4.3, 6.0 and 6.5 deciviews, respectively. The variation is reduced to only 2.1, 2.4, and 3.0 deciviews for the cleanest, average, and haziest days visibility conditions, respectively, when Badlands and Wind Cave National Parks are not included in the grouping of sites.

A detailed review of visibility monitoring data collected by the Green River Basin Visibility Study, using IMPROVE protocols, from 1997 through 2000 is provided in Appendix E. A few conclusions can be drawn from the Division's review of this data.

- The reconstructed total extinction on the cleanest, average, and haziest days was fairly constant over the study period, varying by only 1 deciview.
- Reconstructed total extinction budgets illustrate that the Bridger and Yellowstone sites have cleaner atmospheres than the GRBVS site, with Rayleigh contributions 17%, 12%, and 8% greater on the cleanest, average, and haziest days, respectively.
- Aerosol extinction at the GRBVS is essentially the same, in terms of impact to visibility, on the cleanest and haziest days. This is unusual in that sites, such as Bridger and Yellowstone, typically exhibit distinctly different aerosol extinction patterns on the cleanest and haziest days.

- At the GRBVS site, visibility, in order of greatest impact to visibility, on the cleanest days is attributed to ammonium sulfate, organic carbon, coarse mass, ammonium nitrate, elemental carbon, and fine soil and on the haziest days is attributed to ammonium sulfate, organic carbon, ammonium nitrate, coarse mass, elemental carbon and fine soil.

Appendix E also contains a summary of optical monitoring data collected at the Cloud Peak and Thunder Basin sites. As the optical data has not yet been reconciled with the aerosol data, no conclusions are being put forth on the limited available data.

## **2.4. REQUIREMENT IV**

*Additional measures, including the need for SIP revisions, that may be necessary to assure reasonable progress toward the national visibility goal.*

Measures to prevent future impairment were discussed in Requirement II above. Measures to remedy existing impairment have not been determined to be necessary with respect to impacts from stationary sources until reasonably attributable visibility impairment in a Class I area is certified under WAQSR Chapter 9, Section 2.

With regard to regional haze visibility impairment in Class I areas, the Regional Haze Rule will require the consideration of impairment from all groups of sources, not just stationary sources, not only within Wyoming but in other states as well. The Rule will require the Division to determine levels of natural visibility for each mandatory Federal Class I area, determine the existing visibility levels, and develop a plan to reduce visibility levels from existing to natural in 60 years. Visibility monitoring using aerosol monitors will be basis to evaluate the progress achieved toward natural visibility. To aid the Division in evaluating progress for all seven mandatory Federal Class I areas in Wyoming, an additional Class I area IMPROVE aerosol sampler was installed near the North Absaroka Wilderness Area in January of 2000. This sampler in combination with the other two long term IMPROVE aerosol samplers in Wyoming in Yellowstone National Park and near the Bridger Wilderness Area, should be representative of regional haze conditions in all seven of Wyoming's mandatory Federal Class I areas.

Regional haze is inherently a multi-state, regional problem. Therefore, members of the Wyoming Department of Environmental Quality (DEQ) are participating in the Western Regional Air Partnership (WRAP) Board and WRAP committees and forums. The WRAP is functioning as the regional planning organization for the western states. As such, the WRAP will produce coordinated multi-state, regional solutions for such things as emission inventory development, modeling and emissions reduction strategies that will assist Wyoming in the development of its Regional Haze SIP. The development and implementation of a Regional Haze SIP will play a key role in future measures to remedy regional haze visibility impairment in Wyoming's mandatory Federal Class I areas.

## **2.5. REQUIREMENT V**

*The progress in implementing BART and meeting other schedules set forth in the Long Term Strategy.*

Reasonably attributable visibility impairment has not been certified under WAQSR Chapter 9, Section 2 for any Class I area in Wyoming. Therefore, there currently are no schedules of implementing BART by addition of controls on operating major sources required. With the exception of the 1997 schedule for the Southwest Wyoming Technical Air Forum, there are no other identified schedules in the current Long Term Strategy.

### **2.5.1. Southwest Wyoming Technical Air Forum**

The 1997 Review Report for Wyoming's Long Term Strategy for Visibility Protection included a schedule for the Southwest Wyoming Technical Air Forum (SWWYTAF) modeling project and a determination of the need for Visibility SIP revisions as a result of that project. (See Appendix F, Timeline for SWWYTAF CALPUFF/CALMET Modeling Work, April 2, 1997) Due to several delays, not anticipated during the preparation of the 1997 Review Report, the work products from the SWWYTAF study were significantly delayed and were finally completed in June 2001. The actual completion dates as compared to the projected dates in the April 2, 1997 Timeline are presented in Table 1.

The April 2, 1997 Timeline indicated that EPA would administer the Emissions Data Contract (i.e., Task 2). No contractor was found by Region VIII of the EPA to perform the Task 2 work, necessitating the combination of Task 2 and Task 3 (i.e., application of CALMET/CALPUFF modeling system in southwest Wyoming) into one statement of work for a competitive contractor selection process administered by the DEQ.

The emissions inventory work began in September of 1997 and was expected to take only two months to complete. SWWYTAF realized as Task 2 progressed that the development of an actual emissions inventory, to the level of detail required for the purposes of air quality modeling, and reconciliation with the "top-down" databases was significantly more complex than originally anticipated. Due to the complexity of the work required to complete Task 2, the project schedule suffered from significant delays as emissions inventory development work continued intermittently for over two years into October of 1999. The final report documenting the preparation of the emission inventory was completed in December of 1999.

Unexpected delays with the application of the modeling system (i.e., Task 3) also contributed to a significant extension of the project schedule from eight months to three years, nine months. The SWWYTAF Project Files (i.e., modeling files) were delivered to the DEQ in a seven CD set in February of 2001 and the Modeling Study Final Report based on the final model application results was delivered in June of 2001. In September 2001, the Modeling Study Final Report, Air Emissions Final Report, and SWWYTAF Project Files were made available, upon written request to the Division, for industry, FLMS, and Tribes for their use in air quality related work.

Table 1. SWWYTAF Timeline

<b>Task No. &amp; Description</b>	<b>Date on April 2, 1997 Timeline</b>	<b>Actual Date</b>
<b>Task 1</b> Meteorological Data Contract	Start Work wk of April 1, 1997	Contract Awarded June 1997
	Task Complete June 10, 1997	Task Complete October 7, 1997
<b>Task 2</b> Emissions Data Contract	Award Contract about May 1, 1997	Award Contract with Task 3, September 9, 1997
	Task Complete August 1, 1997	Task Complete December 1999
<b>Task 3</b> Application of CALPUFF/CALMET Modeling System in Southwest Wyoming	Receive Statement of Interest and Qualifications April 18, 1997	Receive Statement of Interest and Qualifications April 18, 1997
	Request for Proposals May 1, 1997	Request for Proposals May 5, 1997
	Receive Proposals June 1, 1997	Receive Proposals June 2, 1997
	Select Contractor by July 1, 1997	Select Contractor June 9, 1997
	Award Contract by August 1, 1997	Award Contract September 8, 1997
	Deliver Final Report and Executable Model by April 1, 1998	Receive Project Files February 2001 Receive Final Report June 2001

### 2.5.1.1. Conclusions

Although the complexity of the SWWYTAF modeling study effort went far beyond that initially envisioned and required significantly more time and resources to complete, the primary SWWYTAF task, to determine the most appropriate tools and assumptions to use to determine air quality impacts in the Bridger and Fitzpatrick Class I areas due to the long-range transport of pollutants from proposed natural gas development, was fulfilled. The resulting Modeling Study Final Report evaluated the degree of degradation of air quality, visibility, and other AQRVs in the Bridger and Fitzpatrick Class I areas that is caused by upwind anthropogenic sources. Further, the performance of the non steady-state CALPUFF dispersion model and its associated wind field model CALMET were evaluated for the ability to predict the measured air quality and AQRVs in the Bridger and Fitzpatrick Class I areas during the 1995 study year.

As identified in the 2000 Review Report, the SWWYTAF model project results have been incorporated into this 2003 Review Report (i.e., the “next report”). The narrative in Appendix F discusses the formation of SWWYTAF as well as the details of the modeling study. To the Division, the most significant finding of the modeling study was that CALPUFF estimated the measured primary pollutants with accuracy without consideration of boundary conditions<sup>18</sup>, but only when the boundary conditions were considered did the CALPUFF model accurately replicate both measured primary gaseous and secondary particulate species. This is significant because it is the fine secondary particulate species that cause most of the visibility impairment.

<sup>18</sup> Pollutants (i.e., SO<sub>2</sub>, SO<sub>4</sub>, NO, NO<sub>2</sub>, NO<sub>3</sub>, and HNO<sub>3</sub>) being transported into the modeling domain from sources outside the domain.

The study also included the development of a VOC emissions inventory and secondary organic aerosol (SOA) formation module as VOCs may photochemically convert into visibility impairing SOA. The study concluded that the emissions inventory and SOA visibility impacts are dominated by biogenic, not anthropogenic, VOC emissions. This result is significant because it negates the hypothesis that the VOC emissions from oil and gas production in southwest Wyoming cause significant visibility degradation at the Bridger and Fitzpatrick Class I areas. It is important to note that while the initial SOA module evaluation is promising, the Modeling Study Final Report recommends further testing and evaluation.

A summary of the source contribution conclusions presented in *The Southwest Wyoming Regional CALPUFF Air Quality Modeling Study – Final Report - Volume I* follows.

- Inflow Boundary Conditions dominate (~90%) for long-lived secondary pollutants (Sulfate (SO<sub>4</sub>) and Nitrate (NO<sub>3</sub>)).
- In-Domain Sources dominate (~70%) for primary pollutants (SO<sub>2</sub>).
- Boundary Conditions dominate for wet deposition flux (Sulfur ~ 83-92% and Nitrogen ~ 79-88%) at Pinedale, Sinks Canyon, South Pass, and Gypsum Creek.
- In-Domain Biogenic Sources dominate (>90%) for secondary organic aerosols.

To resolve the concerns expressed by SWWYTAF participants regarding the SWWYTAF Final Report the SWWYTAF Technical Committee prepared a *SWWYTAF Technical Committee Summary* to accompany the SWWYTAF Final Reports and Project Files. The SWWYTAF Technical Committee Summary identifies, among other things, the uses for which the model is valid or not valid as well as concerns and drawbacks for the application of the model. The *SWWYTAF Technical Committee Summary* is included in Appendix F.

The *SWWYTAF Technical Committee Summary* expresses the concern that the CALPUFF model may have more uncertainty than is portrayed in the analysis due to questions surrounding the representativeness of the boundary condition sources. This is a valid concern, however, while the percentages presented above may not be exact, there is no doubt that the SWWYTAF modeling study revealed that the visibility impacts in the Bridger and Fitzpatrick Wilderness Areas are due to regional sources outside of the extensive SWWYTAF modeling domain. Therefore, the Division believes that the SWWYTAF modeling study has demonstrated that the appropriate mechanism to address visibility impairment at the Bridger and Fitzpatrick Wilderness Areas is not through the *Wyoming State Implementation Plan for Class I Visibility Protection*, for reasonably attributable visibility impairment, but through a Regional Haze SIP.

#### **2.5.1.2. Additional Analysis of Oil and Gas Development**

The Division had committed to perform additional analysis with the SWWYTAF model in the April 2, 1997 Timeline by June 1, 1998. The additional analysis was to consist of an assessment of impacts to air quality and visibility in the Bridger and Fitzpatrick Wilderness Areas from

future projected and current emissions from oil and gas development in southwest Wyoming. The results from that analysis were to be used by the Division to determine if Wyoming's Visibility SIP should be revised. It is important to recognize that this commitment was made at the time that Bureau of Land Management (BLM) EIS air quality analyses were being conducted with the ISCST3 model, a straight line plume transport model, and SWWYTAF had the only plans to utilize the more sophisticated CALMET/CALPUFF<sup>19</sup> modeling system in southwest Wyoming.

Since that time and during the extended SWWYTAF modeling project schedule, two modeling analyses in southwest Wyoming have been completed, Continental Divide/Wamsutter II<sup>20</sup> and Pinedale Anticline<sup>21</sup> EISs, which utilized the more sophisticated and realistic CALMET/CALPUFF modeling system to predict visibility and acid deposition impacts at Class I and sensitive Class II areas. The Pinedale Anticline Draft EIS cumulative impact analysis was conducted with the CALMET/CALPUFF modeling system and assumed the implementation of over 8,450 wells and associated compression from the proposed project and other reasonably foreseeable development (i.e., other NEPA projects) over the next 10-15 years. The cumulative impact analysis also included gas well additions/removals as well as sources permitted by the Division between 1995 and 1998. The cumulative analysis showed that visibility impacts would not exceed a 1.0 deciview change and that a change of 0.5 deciview would be exceeded by four to nine days at the Bridger Wilderness Area and two days at the Fitzpatrick Wilderness Area, depending on which alternative assumptions were applied. The cumulative impact analysis also disclosed that all potential changes in lake acidity are well below the acceptable limits established by the U.S. Forest Service.

The U.S. Forest Service reviewed the days of modeled cumulative visibility impacts that were greater than 0.5 deciview change and determined that cumulatively, the impacts from the Pinedale Anticline Project, combined with other recently proposed projects in southwest Wyoming, would be significant in increasing visibility impairment in the Bridger Wilderness Area. However, based on the application of emissions reduction mitigation efforts by Ultra Petroleum and PacifiCorp at the Naughton power plant, and considering the timing, magnitude and duration of the projected cumulative visibility impacts, the U.S. Forest Service considers these impacts to be within an acceptable range. The Wyoming Department of Environmental Quality, Air Quality Division also reviewed the days of modeled cumulative visibility impacts greater than 0.5 deciview change and the fact that there are no modeled impacts over 1.0 deciview change. The preamble for the Regional Haze Rule states, "A one deciview change in haziness is a small but noticeable change in haziness under most circumstances when viewing scenes in Class I Areas." Based upon that definition and consideration that all of the days of modeled cumulative visibility impacts at Class I areas had a magnitude of change less than 1.0

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<sup>19</sup> Earth Tech Inc.; CALMET Meteorological Model, Version 5.0 and CALPUFF Dispersion Model, Version 5.0; Concord, MA, 1998

<sup>20</sup> Bureau of Land Management, U.S. Department of Interior, REVISED Air Quality Impact Assessment Technical Support Document, Continental Divide/Wamsutter II and South Baggs Natural Gas Development Projects – Environmental Impact Statements; Rawlins and Rock Springs Field Offices, September 1999.

<sup>21</sup> Bureau of Land Management, U.S. Department of Interior, Pinedale Anticline Oil and Gas Exploration and Development Project Draft Environmental Impact Statement, Technical Report; Pinedale Field Office, November 1999.

deciview, the Division has determined that the cumulative impacts are not significant in increasing visibility impairment.<sup>22</sup>

The Pinedale Anticline EIS air quality modeling analysis was conducted while the SWWYTAF modeling study suffered from unforeseen delays and the timeline committed to in the 1997 Review Report had long since passed. Although the Pinedale Anticline EIS air quality modeling analysis was not performed by the Division, Division personnel were involved in the Pinedale Anticline EIS air quality modeling analysis as a result of the State of Wyoming's cooperating agency status for that EIS. Therefore, the Division reiterates the conclusion presented in the 2000 Review Report that the steps committed to in the 1997 Review Report are no longer necessary, as the Pinedale Anticline EIS air quality analysis performed an updated air quality and visibility impact assessment of future projected and current emissions from oil and gas development in southwest Wyoming with the CALMET/CALPUFF modeling system.

### **2.5.1.3. Additional Analysis**

The 1997 Review Report also stated with regard to the SWWYTAF modeling project that the Division will be able to track the impact of minor source growth as well as have a state-of-the-art modeling system for use in analyzing impacts from major PSD source applications. The Division has and will use components of the SWWYTAF modeling system in analyzing impacts from major PSD source applications.

In November of 1997, the Wyoming Department of Environmental Quality received a letter from EPA Region VIII that stated:

“... once the SWYTAF cumulative modeling analysis for visibility/acid deposition has been completed, we request the state conduct an analysis to determine the status of NO<sub>2</sub> PSD increment consumption in the Bridger-Teton Class 1 Wilderness area.”

Any Long Term Strategy focused on identifying, reducing or preventing visibility impacts to Class I areas, whether from reasonably attributable effects or regional haze, and on evaluating potential increment consumption issues anywhere in the State must be grounded in an accurate and comprehensive baseline and current emissions inventory. Such an inventory does not yet exist for the State of Wyoming. However, the Division recently solicited proposals for development over the next year of a statewide emissions inventory database system in which all emissions data will reside and which will be populated with calendar year 2002 actual and potential emissions data. Concurrently, Division staff are in the process of developing a baseline emissions inventory as of the minor source baseline dates in Wyoming for pollutants for which allowable increments have been established. Once the baseline and current inventories are completed, the Division intends to perform a PSD Class I NO<sub>2</sub> increment consumption analysis for the Bridger and Fitzpatrick Wilderness Areas, as requested by EPA Region VIII, using components of the SWWYTAF modeling system, as well as a Class II analysis for the Powder

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<sup>22</sup> Bureau of Land Management, U.S. Department of Interior, DRAFT Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project, Sublette County, Wyoming; Pinedale Field Office, November 1999, pages 5-19 & 5-20.

River Basin area of northeast Wyoming. The SWWYTAF modeling system, with an updated emissions inventory, will also be a major tool in developing strategies that may be implemented in Wyoming's Regional Haze SIP.

The Division has considered the results from the Pinedale Anticline air quality analysis, the commitments to use the SWWYTAF modeling system, as well as all other information contained in this 2003 Review Report in evaluating whether revisions to Wyoming's Visibility SIP are warranted. The Division has concluded that Wyoming's Visibility SIP is adequate for making reasonable progress toward the national visibility goal of remedying existing and preventing future impairment that can be attributed to a source or small group of sources. The Division is now looking toward the future development and implementation of a Regional Haze SIP to remedy existing and preventing future regional haze visibility impairment in Wyoming's mandatory Federal Class I areas. Wyoming's experience in SWWYTAF clearly indicates that resolution of regional haze impacts to mandatory Federal Class I areas demands a regional approach, including a consistent emissions inventory, a common modeling tool, and an extensive monitoring network to provide the necessary "reality checks" for modeled outputs.

## **2.6. REQUIREMENT VI**

*The progress in developing the components of the strategy.*

The *Wyoming State Implementation Plan for Class I Visibility Protection* identifies five components of the Long Term Strategy. The following is a progress assessment of each of those components.

### **2.6.1. Review of Impact from New or Modified Sources**

The Division has been consistent in requiring a Class I area visibility impact analyses for new PSD major stationary sources and PSD major modifications in accordance with WAQSR Chapter 9, Section 2(e).

“Applicants for new major stationary sources and major modifications shall demonstrate that the proposed source will not cause an adverse impact on visibility in a Class I area as required by Chapter 6, Section 4 of this Regulation. New source review requirements for visibility are in Chapter 6, Section 2(n)(i) and Chapter 6, Section 2(n)(ii); and Chapter 6, Section 4(b)(i)(B)(I), Chapter 6, Section 4(b)(i)(F), Chapter 6, Section 4(b)(vi)(A) and (B), and Chapter 6, Section 4(b)(vii).”

Chapter 9, Section 2(e) refers such review and authority to WAQSR Chapter 6, Section 4 Prevention of significant deterioration, which is a SIP approved regulation. The analysis provisions are required by Chapter 6, Section 4(b)(i)(B)(I), which is consistent with the EPA rule in 40 CFR 51.166(o)(1), states

“The owner or operator shall provide an analysis of the impairment to visibility, soils and vegetation that would occur as a result of the **facility or modification** and general commercial, residential, industrial, and other **growth associated with the facility or modification**. The owner or operator need not provide an analysis of the impact on vegetation having no significant commercial or recreational value.” (Emphasis added)

To satisfy the requirements of WAQSR Chapter 6, Section 4(b)(i)(B)(I), a PSD permit applicant provides to the Division a visibility impact analysis that relies on dispersion models to estimate the visibility impact of the proposed facility or modification per the approved modeling protocol.<sup>23</sup> See Section 2.2.1.5 of this report for a complete description of the procedural aspects of Prevention of Significant Deterioration Permit Coordination. A cumulative visibility impact analysis is not required by WAQSR Chapter 6, Section 4(b)(i)(B)(I). The visibility impact analysis is to include a discussion of all assumptions for the analysis, the model input as well as the model results. The model results should identify the changes in visibility in terms of the number of days above a 5 or 10 percent change in extinction and/or a 0.5 or 1.0 deciview change, as specified in the modeling protocol.

The Division’s review of the visibility impact analysis submitted by the permit applicant includes, but is not limited to, validating and duplicating the model results. Additional visibility impact analysis runs may be conducted by the Division should the BACT emissions levels be modified during the Divisions permit application analysis process. The Division utilizes the results of the visibility impact analysis to evaluate whether or not visibility is adversely impacted by the proposed facility or modification. An adverse impact on visibility is defined by WAQSR Chapter 9, Section 2(c)(i) as

“...visibility impairment which interferes with the management, protection, preservation, or enjoyment of the visitor’s visual experience of the Class I area. Any determination shall be made on a case-by-case basis taking into account the geographic extent, intensity, duration, frequency and time of visibility impairments, and how these factors correlate with times of visitor use of the Class I area, and the frequency and timing of natural conditions that reduce visibility.”

After the application has been deemed complete and upon receipt of the visibility impact analysis information submitted to the Division by the permit applicant, the FLM should be able to exercise their “affirmative responsibility” and use the results from the permit applicants visibility impact analysis and other information to conduct an independent AQRV impact analysis and make an informed decision about whether or not AQRVs, including visibility, will be adversely affected. The FLM may utilize the AQRV impact analysis to demonstrate to the Division that AQRVs are, or will be, adversely affected. The Division considers the FLM demonstration, when one is submitted to the Division, in making its proposed decision on the PSD permit application.

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<sup>23</sup> The modeling protocol specifies the visibility impact analysis methodology, receptor locations and model input such as emissions when utilizing BACT, stack data, and meteorological data.

This practice of implementing the New Source Review and Prevention of Significant Determination regulations, in conjunction with the stringent application of BACT, goes a long way toward preventing future visibility impairment in Class I areas.

## **2.6.2. Emission Reductions Due to Ongoing Control Programs**

The SO<sub>2</sub> emissions reduction program in southwest Wyoming was detailed in the original Long Term Strategy. A significant reduction in SO<sub>2</sub> emissions (approximately 45,000 tons) was achieved in southwest Wyoming during the period of 1985 to 1991 due to the installation of scrubbers on power plant stacks required by emission standards adopted in the 1974-1975 timeframe. The scrubber on the Jim Bridger Power Plant Unit #1 came on-line and was compliance tested before the September 1, 1990 deadline from the original compliance order. This completed the SO<sub>2</sub> emissions reduction program discussed in the original Long Term Strategy.

There are no other identified emissions reduction programs in the current Long Term Strategy.

## **2.6.3. Smoke Management Techniques**

This is the one component of the original Long Term Strategy that needs to be more fully developed. The Division currently operates an open burning permit program under WAQSR Chapter 10, Section 2 Open burning restrictions which includes the permitting of prescribed fires occurring on Federal and State lands. This program requires Federal and State land managers to perform modeling to determine meteorological conditions under which burning can occur and maintain compliance with ambient air quality standards.

### **2.6.3.1. Smoke Management Guidance**

The existing guidance on smoke management for states/tribes to address public health (i.e., NAAQS) and welfare impacts of smoke is EPA's *Interim Air Quality Policy on Wildland and Prescribed Fires*<sup>24</sup> (EPA Interim Policy) and the Agricultural Air Quality Task Force's Recommendation on *Air Quality Policy on Agricultural Burning*<sup>25</sup> (AAQTF Air Quality Policy). The EPA Interim Policy promotes collaboration among Federal, state, tribal, and private wildland owners and air quality managers to address the air quality impacts of wildland and prescribed fires. The EPA Interim policy broadly describes the elements of a basic smoke management program and recommends that states/tribes implement smoke management programs to mitigate the nuisance and public safety hazards posed by smoke intrusions into populated areas; to prevent deterioration of air quality and NAAQS violations; and to address visibility impacts in mandatory Federal Class I areas. The AAQTF Air Quality Policy sets up a two-tiered voluntary program. The first tier of the voluntary program is based on a predetermined set of burn conditions while the second tier is designed for areas where agricultural burning would be expected to contribute to NAAQS violations or to visibility

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<sup>24</sup> U.S. EPA, Office of Air Quality Planning and Standards, *Interim Air Quality Policy on Wildland and Prescribed Fires*, April 23, 1998.

<sup>25</sup> Agricultural Air Quality Task Force, *Air Quality Policy on Agricultural Burning, Recommendation to the U.S. Department of Agriculture*, November 19, 1999.

impairment in mandatory Federal Class I areas. The EPA Interim Policy and the AAQTF Air Quality Policy do not specifically provide guidance for smoke management programs that address visibility effects.

Division staff actively participate in the WRAP Fire Emissions Joint Forum (FEJF) which was formed to address both policy and technical issues concerning smoke effects that are caused by wildland and agricultural fires on public, tribal, and private lands. The FEJF is guided by the recommendations contained in the GCVTC Final Report and the requirements of the Regional Haze Rule regarding fire emissions and visibility. The FEJF has developed several policies for the WRAP through a stakeholder-based consensus process to assist the WRAP states and tribes in addressing emissions from fire sources. In these policies, the WRAP seeks to provide a consistent framework that states and tribes can use to efficiently develop their individual regional haze implementation plans, long term strategies, and periodic progress reports. Seminal documents such as the GCVTC Recommendations, the Regional Haze Rule, EPA Interim Policy, and AAQTF Air Quality Policy form the basis for the development of the FEJF work products.

Although Section 309 of the Rule contains specific requirements for fire in comparison to Section 308, the WRAP has advanced the following policies developed by the FEJF as viable tools for both Section 308 and Section 309 states to meet the requirements of the Rule.

- The WRAP *Policy for Categorizing Fire Emissions*<sup>26</sup> was developed to clarify the complex relationship between what is considered a natural source of fire and what is considered a human-caused source, as acknowledged in the Rule. A methodology to categorize fire emissions as either “natural” or “anthropogenic” is the basis of the Policy; thus providing the foundation for fire’s inclusion in natural background condition values and ultimately, the tracking of reasonable progress.
- The *WRAP Policy on Enhanced Smoke Management Programs for Visibility*<sup>27</sup> defines the enhanced smoke management program as smoke management efforts that specifically address visibility, thereby, going beyond the EPA Interim Policy and the AAQTF Air Quality Policy specific guidance provided for smoke management programs that address public health and nuisance concerns. The Policy identifies for states/tribes in the WRAP region the elements of an enhanced smoke management program to address visibility effects from all types of fire that contribute to visibility impairment in mandatory Federal Class I areas.

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<sup>26</sup> Western Regional Air Partnership, Fire Emissions Joint Forum, Natural Background Task Team, Policy for Categorizing Fire Emissions, November 15, 2001.

<sup>27</sup> Western Regional Air Partnership, Fire Emissions Joint Forum, Enhanced Smoke Management Task Team, WRAP Policy on Enhanced Smoke Management Programs for Visibility, November 12, 2002.

- The WRAP defines the annual emission goal as a quantifiable value that is used to measure progress each year toward the desired outcome of achieving the minimum emission increase from fire. In the *WRAP Policy on Annual Emissions Goals for Fire*<sup>28</sup>, the WRAP outlines a process by which states/tribes may establish annual emission goals, based on the utilization of currently available emission reduction techniques, to include in their Regional Haze SIPs.
- It is the position of the *WRAP Policy on Fire Tracking Systems*<sup>29</sup> that it is necessary to track fire activity information in the WRAP region using a fire tracking system, which will also provide the information essential to create a fire emissions inventory. The Policy identifies seven essential components of a fire tracking system that represent the minimum spatial and temporal fire activity information necessary to consistently calculate emissions and to meet the requirements of the Rule.

### **2.6.3.2. Smoke Management Program Development**

A cooperative effort was initiated by the Division in 1998 to develop a more mature smoke management program to better manage smoke emissions from prescribed burning on Federal, and state lands and address visibility impacts in Class I areas. The cooperative effort produced a finalized list of issues and concerns, which was to be considered during the development of a preliminary draft smoke management plan by the Division. The next step in the development of a smoke management plan was for the Division to draft a strawman smoke management plan for review and comment by the Federal and State prescribed burners prior to holding the next multi-agency meeting. Due to staff resources and routine responsibilities, the cooperative effort stagnated when the development of a strawman smoke management plan by the Division suffered from continual delays.

In the 2000 Review Report, the Division identified a target for having a more mature smoke management plan in place for the 2001 burn season. Once again staff resources and responsibilities did not allow the Division to commit to the development of a smoke management plan for the 2001 burn season. However, as previously mentioned, Division staff have been participating in the FEJF, that is addressing both policy and technical issues concerning smoke effects that are caused by wildland and agricultural fires. It is the Division's intent to build upon the consistent framework of the FEJF work products to efficiently develop programs related to fire for inclusion in Wyoming's Regional Haze SIP, long term strategies, and periodic progress reports. The Division will take into consideration the EPA Interim Policy, AAQTF Air Quality Policy, and WRAP Policies regarding fire during the development of a smoke management program to address public health, nuisance, and visibility. In developing programs related to fire for inclusion in Wyoming's Regional Haze SIP, the Division will build off of the previous cooperative effort and use a collaborative process that includes state, tribal, and land management agencies and private parties.

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<sup>28</sup> Western Regional Air Partnership, Fire Emissions Joint Forum, Annual Emission Goals Task Team, WRAP Policy on Annual Emission Goals for Fire, DRAFT December 16, 2002.

<sup>29</sup> Western Regional Air Partnership, Fire Emissions Joint Forum, WRAP Policy on Fire Tracking Systems, DRAFT December 19, 2002.

## **2.6.4. Other Factors Which Must Be Considered**

Since adoption of Wyoming's Visibility SIP and Visibility regulation, neither the Federal Land Managers of any Class I area nor the Division has certified that visibility impairment, that can be attributed to a source or small group of sources, exists in any Class I area pursuant to provisions in Chapter 9, Section 2 of the WAQSR. Therefore, there has been no development of this component of the original Long Term Strategy.

## **2.6.5. Adequacy of Long Term Strategy**

The Division has considered all information contained in this 2003 Review Report in evaluating whether revisions to Wyoming's Visibility SIP are warranted. The Division has concluded that this Long Term Strategy, Wyoming's Visibility SIP, WAQSR Chapter 9, Section 2 along with WAQSR Chapter 6, Sections 2 and 4 are adequate for making reasonable progress toward the national visibility goal of remedying existing and preventing future impairment that can be attributed to a source or small group of sources.

The development and implementation of a Regional Haze SIP will play a key role in future measures for making reasonable progress toward the national visibility goal of remedying existing and preventing future regional haze visibility impairment in Wyoming's mandatory Federal Class I areas. Wyoming's experience in SWWYTAF clearly indicates that resolution of regional haze impacts to mandatory Federal Class I areas demands a regional approach, including a consistent emissions inventory, a common modeling tool, and an extensive monitoring network to provide the necessary "reality checks" for modeled outputs.

## **3. PROVISIONS NOT ADDRESSED**

There are two provisions that Federal regulations require be addressed in the periodic report on the Long Term Strategy that are not in Wyoming's SIP and regulation. As a result, an assessment of those two provisions is not performed for the Long Term Strategy Review Report. A description of the two provisions and why they are not included in Wyoming's SIP and regulation follows.

*The impact of any exemption granted under Section 303 (40 CFR Part 51).*

This provision refers to an exemption from applying BART that sources may apply for under the Federal regulation. Wyoming's regulation does not provide sources the opportunity to apply for an exemption from BART. Since this is more stringent than the Federal requirement, EPA approved the absence of this assessment requirement in its approval of Wyoming's SIP published in the Federal Register on February 15, 1989 under 40 CFR 52.

*The need for BART to remedy existing impairment of any integral vista listed in the plan since the last report.*

This provision requires an assessment of the need for BART to remedy impairment of integral vistas. An integral vista is a view from within a Class I area to a landmark or panorama located

outside the Class I area. EPA’s regulations required the FLMs to identify any integral vistas in Wyoming prior to December 31, 1985. Wyoming’s regulation does not list integral vistas nor provide for the protection of integral vistas since neither the State nor FLMs identified integral vistas at the time the State regulation was adopted. Again, EPA’s discussion of the approval of Wyoming’s SIP in the Federal Register notice acknowledged Wyoming’s right to not protect integral vistas and approved the exclusion of this assessment requirement.

#### **4. EMISSION TRENDS**

An emissions data assessment is presented in Appendix G for the Aerometric Information Retrieval System (AIRS) database actual emissions inventory, the Division’s Air Quality Data System (AQDS) potential emissions, the 1996 WRAP emission inventory and a NO<sub>x</sub> emission inventory for northeast Wyoming. The following sections of this report are an assessment of each of the emission trends data mentioned above.

To better demonstrate emission trends throughout Wyoming, the State has been split into quadrants. For the AIRS and potential emission sections, the State was divided by county as follows:

<b>Quadrant</b>	<b>Wyoming Counties</b>
Northeast	Sheridan, Johnson, Campbell, Crook, Weston
Northwest	Big Horn, Park, Teton, Washakie, Hot Springs
Southeast	Natrona, Converse, Niobrara, Goshen, Platte, Albany, Carbon, Laramie
Southwest	Sweetwater, Sublette, Fremont, Uinta, Lincoln

Within the AQDS potential section, the area of the BLM Rock Springs District is evaluated. This area includes all of Uinta, Lincoln and Sublette counties, Sweetwater county (all west of and including Range 98 West) and Fremont county (Townships 27 and 28 North, Ranges 99 through 102 West). The Division’s inventory of northeast Wyoming NO<sub>x</sub> emissions was expanded from the previously mentioned “northeast quadrant”. This study includes Sheridan, Johnson, Campbell, Crook, Weston, Natrona, Converse and Niobrara counties. A map of Wyoming that shows the different emission inventory areas can be found in Appendix G.

##### **4.1. AIRS ACTUAL EMISSIONS INVENTORY**

Actual emission trends data from EPA’s inventory database, AIRS, for the period 1985-2001 for major stationary sources is presented in Appendix G. For the period of 1985-1990, no emission data were required to be reported and entered for the intervening years into AIRS. The emission data for the years 1985 and 1990 has been validated and is accurate with one exception. The CO emissions in 1985 and 1990 for southeast Wyoming do not reflect the actual emission for those years. Emission factors applied to calculate actual emission from the fluid catalytic cracking unit (FCC) at two refineries resulted in very high CO emissions. The FCC units were tested and actual emissions were much lower than the emission factors previously used to calculate actual CO emission.

The Division is confident that the sharp decline in SO<sub>2</sub> emissions in southwest Wyoming, while exaggerated due to the scale, is accurate due to the significant reduction of SO<sub>2</sub> emissions that were occurring at the Jim Bridger power plant at this time. Between 1998 and 2001 there was also a reduction in CO emissions in southwest Wyoming. The largest reductions came from O.C.I. Wyoming, L.P.'s Big Island Soda Ash plant. The decrease came from lower stack tested emissions as well as a change in the method the Division used due to an effort to make emission inventories consistent throughout the State. Other reductions occurred at Solvay Minerals Incorporated's Green River Soda Ash plant and BP America Company's Whitney Canyon Gas Plant. Both of those reductions are from lower tested stack emissions. Other less significant reductions of CO emission came from many smaller facilities.

There was a large reduction in SO<sub>2</sub> emissions in southeast Wyoming between 1998 and 2001. PacifiCorp's Dave Johnston power plant had a large reduction attributed to switching to coal with lower sulfur content in 2000. There was also a large reduction in SO<sub>2</sub> emissions at the Sinclair Refinery in Sinclair, Wyoming. Sinclair used fuel oils with lower sulfur content, used less fuel oil, and installed a continuous emissions monitor on their FCC, instead of using emission factors to determine emissions.

Emission inventories of major operating sources have taken on a higher degree of importance and accuracy since 1991 due to the Clean Air Act Amendments of 1990 Title IV Acid Rain Program and the Title V Operating Permit Program. Both of these programs require or give the impetus for more accurate emission inventories for major sources. The Title V Operating Permit Program also revealed some major sources that were not part of the emission inventory system; these were primarily in the oil and gas industry. The AIRS emission inventory is an accurate way to represent major sources in the State; however it is not intended to represent the actual emission for all stationary sources (i.e., major and minor) throughout Wyoming.

## **4.2. AQDS POTENTIAL EMISSIONS**

The Division uses the AQDS, which is an Access database developed by Division personnel in 1996-1997, to track and store information about the Operating Permit, Compliance, and NSR Programs. The NSR Program utilizes the AQDS to track potential emission increases and decreases, for new or modified, major and minor sources statewide. The information contained in the database for the NSR Program was used in several emission trend plots and tables in Appendix G. The trends depict changes in potential emission that have occurred in Wyoming since the development of the 2000 Review Report. Major increases and decreases can be attributed to both source specific changes and industry-wide changes. Descriptions of large emission increases/decreases from specific facilities can be found in Appendix G along with the trends. Changes from CBM development and the oil and gas industry are described here as well as in Appendix G.

Since 1999, there has been a significant increase in CBM activity, especially in the northeast quadrant of Wyoming. (See Section 2.2.1.2.) The large number of compressor engines associated with CBM development has caused the increase of CO, VOC, and NO<sub>x</sub> permitted emissions in the northeast, which can be seen in the trend plot in Appendix G. The CBM industry continues

to grow in the northeast quadrant of the State and options for development are being pursued along the southern portion of the State as well.

In October 1995, the Division initiated a program to ensure that all oil and gas production units were permitted. (See Section 2.2.1.1.) The rise in applications from already constructed production sites plus ongoing oil and gas development caused an increase in permitted VOC emissions from 2000 through 2002. This development is primarily located in the southwest quadrant of the State and can be seen in the potential trend in Appendix G. There is also a slight rise in VOC potential emission in the southeast quadrant from oil and gas development.

The potential emissions in the Rock Springs BLM District trend in southwest Wyoming, included in Appendix G, is based upon reports generated annually with the AQDS to satisfy an emission tracking agreement between DEQ and the BLM. The amended agreement, effective April 17, 2000, requires NO<sub>x</sub> potential emission increases and decreases to be tracked on both Federal and non-Federal lands in the Rock Springs BLM District area. The potential VOC emission increase in southwest Wyoming discussed above can be seen in the trend as well as the NO<sub>x</sub> decrease at the PacifiCorp Naughton power plant, which is discussed in Appendix G.

### **4.3. NORTHEAST WYOMING NO<sub>x</sub> INVENTORY**

Since issuance of the 2000 Review Report, the Division has developed an inventory of NO<sub>x</sub> for the northeastern section of the State. This region was expanded from the quadrants used in the AIRS and AQDS inventory representations. The inventory includes Sheridan, Johnson, Campbell, Crook, Weston, Natrona, Converse and Niobrara counties. The inventory includes five source categories, which were evaluated for either 2000 actual emissions or potential emissions based on permits issued as of May 2001.

Emissions from diesel-fired locomotive engines were evaluated for 2000 actual emissions, which included both mainline and mine loop railways. Urban sources were also evaluated for 2000 actual emissions. Urban emissions are determined from natural gas heating, vehicle traffic, solvent usage and gasoline usage (solvents and gas emissions are primarily VOCs and therefore not used in this inventory). Natural gas usage was obtained from local utility companies. Highway emissions are also 2000 actual emissions based on information on vehicle type and vehicle miles traveled obtained from the Wyoming Department of Transportation. Results from these categories can be found in Appendix G.

Coal mine emissions are estimated potentials from permits that were issued as of May 2001. The coal mine category does not include emissions on rail loops at the mine. Point source emissions are also the permitted potentials as of May 2001. The point source category includes major and minor point sources, down to an emission rate of approximately 2 tons of NO<sub>x</sub> per year. The point source category does not include oil and gas production sites, flares and some smaller sources that did not have all parameters available for a complete inventory record.

The largest contributors to NO<sub>x</sub> emissions are point sources, which account for approximately 64% of emissions. Railroads account for 20% of the NO<sub>x</sub> emissions in the eight county area. In Appendix G, the point source category is broken down by county. Campbell County and

Converse County are the two largest emission contributors, accounting for almost 90% of NO<sub>x</sub> potential point source emissions.

#### **4.4. WRAP 1996 EMISSION INVENTORY**

In 2002, the WRAP completed a western states emission inventory for the year 1996. The inventory is intended to serve as a base-year, regional-scale emissions inventory that will be used in model testing, model validation, and for developing estimated future-year inventories that can be used to test the effects of various control strategies. The inventory accounts for criteria pollutants (not including Lead), CO and Ammonia (NH<sub>3</sub>). The pollutants are inventoried from the following source categories: point sources, area sources, wildfire, prescription fire, on-road vehicles and non-road vehicles, paved road dust and unpaved road dust. Results of the 1996 WRAP Emissions Inventory for the State of Wyoming can be found in Appendix G, along with charts that show source distribution for each pollutant.

The 1996 National Emissions Inventory (NEI) was the starting point for the preparation of this regional inventory. EPA prepares the NEI inventory with input from state, local and tribal organizations. The 1996 base-year was selected because this is the latest year for which national emissions have been subject to extensive quality assurance and review. Point source emissions from NEI were checked by each state and resubmitted. The states used their discretion when determining the size cutoff for point sources. In the same manner, states checked and resubmitted area source information to the Emission Forum. The results were then checked by E.H. Pechan & Associates, Inc. for quality assurance and corrected when necessary.

The WRAP Mobile Sources Forum prepared the on-road and non-road vehicle inventories as well as the paved and unpaved road dust inventories. On-road sources include cars, trucks, buses, and motorcycles. Off-road sources are aircraft and its support equipment, locomotives, commercial marine and pleasure craft, and equipment used for construction, logging, mining, agriculture, and lawn and garden care. Paved road dust is re-entrained roadway fugitive dust from a paved road. Unpaved road duct is re-entrained fugitive dust from an unpaved road.

The WRAP FEJF prepared the Wildfire and Prescribed (Rx) fire emission estimates. The FEJF consulted with state and Federal agencies to inventory fire events in 1996. Prescribed fires are any fires ignited by management actions to meet specific objectives. The prescribed fire inventory includes wildland fires only, meaning fire in an area where development is generally limited to roads, railroads, power lines and widely scattered structures. The prescribed fire inventory for 1996 does not include agricultural burning, as the agricultural burning data compiled for 1996 did not meet the goal of developing a spatially resolved historical emission inventory for 1996. Wildfires are any unwanted, non-structural fire.

## **5. PROGRESS TOWARD 2000 RECOMMENDATIONS**

*Wyoming's Long Term Strategy for Visibility Protection 2000 Review Report* identified four report recommendations. The following sections discuss each of those recommendations.

### **5.1. REGIONAL HAZE**

The 2000 Review Report recommended that the Division continue participation in the WRAP to produce coordinated multi-state, regional solutions for such things as emissions inventory development, modeling protocols and emission reduction strategies that will assist Wyoming in the development of its Regional Haze SIP. The Division continues to be heavily involved in the WRAP, which is an organization formed to address visibility issues in the West, particularly in response to the requirements of the Regional Haze Rule. DEQ personnel currently participate in the WRAP Board, Coordinating Group, Communications Committee, Air Managers Committee, Initiatives Oversight Committee, Technical Oversight Committee, Fire Emissions Joint Forum, Market Trading Forum, Emissions Forum, Modeling Forum, and Ambient Air Monitoring and Report Forum. The Division will continue to be involved at all levels of the WRAP policy and technical committees and forums to advance our viewpoints and insure a regional solution to a common issue. In particular our focus is directed at insuring that the technical work products resulting from this cooperative regional effort are both timely and adequate for Wyoming to prepare and submit a Regional Haze SIP to EPA potentially as early as December 31, 2003 but no later than December 31, 2008, depending on the option chosen as required by the Rule.

As one of the nine Transport Region States addressed by the GCVTC, Wyoming has a choice to either follow the Section 309 provisions to implement the recommendations of the GCVTC within the framework of the regional haze program or the nationally applicable Section 308 provisions of the Rule. As of the preparation of this 2003 Review Report, the State of Wyoming had not yet decided whether it would submit a Regional Haze SIP under Section 309 or 308 of the Rule. That decision will be based on the option that best allows the State of Wyoming to respond to the requirements of the Rule. There are several uncertainties at the present time that affect that decision. The uncertainties are the court remand to EPA on the BART provisions, the Section 308/Section 309 link for "other Class I areas", and the legality of the approach for coordinating Regional Haze SIP submittal dates.

In the winter of 2002, the Division held two regional haze stakeholder meetings to 1) provide stakeholders a common level of general understanding of the implications of the Rule and the options available to the State of Wyoming in submitting a SIP pursuant to the requirements of the Rule, 2) discuss the various viewpoints regarding the implications of the American Corn Growers court decision on the provisions of the Rule and 3) draft a proposed addition to the Wyoming Environmental Quality Act authorizing emission trading programs. As a result of input from regional haze stakeholders, Governor Jim Geringer sent a letter to Governor Christine Todd Whitman, U.S. EPA Administrator, requesting that EPA extend the deadline to file SIPs under Section 309 of the Rule by the amount of time that it takes EPA to resolve the remanded portions of the Rule and specifically define the 308 option. In addition, House Bill 0245 was introduced in the 57<sup>th</sup> Legislature of the State of Wyoming 2003 General Session to provide for emission trading programs. House Bill 0245 passed both the House and Senate without

amendment and was signed by Governor Dave Freudenthal on March 6, 2003 to go into effect on July 1, 2003.<sup>30</sup> With the passage of legislation authorizing emission trading programs, the State of Wyoming now possesses the statutory ability to enter into emission trading programs under either Section 308 or 309 of the Rule.

The Division is now planning to bring Wyoming's new Governor and new DEQ Director up to speed on the Section 308/Section 309 decision at hand and will also reconvene the regional haze stakeholders for additional meetings. The Division in concert with direction from Wyoming's new leadership and the regional haze stakeholders will proceed with the develop of a plan and regulations to meet the requirements in the Rule and submit a Regional Haze SIP to EPA. This process will be initiated in the near future and the Division suggests that proponents of visibility standards should become involved in the public process of adopting rules and developing the plan to address regional haze visibility impairment.

## **5.2. SWWYTAF AIR QUALITY MODELING PROJECT**

As discussed under Requirement V above, the 1997 Review Report included a schedule and commitment to provide an acceptable dispersion model with a comprehensive emissions inventory and applicable meteorological data for use by the Division to assess future projected and current emissions from oil and gas development in southwest Wyoming. The Division reiterates the conclusion presented in the 2000 Review Report that the steps committed to in the 1997 Review Report are no longer necessary, as the Pinedale Anticline EIS air quality analysis performed an updated air quality and visibility impact assessment of future projected and current emissions from oil and gas development in southwest Wyoming with the CALMET/CALPUFF modeling system.

Although unexpected delays with Tasks 2 and 3 contributed to a significant extension of the SWWYTAF project schedule, the Division continued to work with SWWYTAF and the contractor to finalize the work to develop an air quality dispersion model for southwest Wyoming as committed to in the 2000 Review Report. As a direct result, the SWWYTAF Project Files (i.e., modeling files) and Modeling Study Final Report were delivered to the Division in February 2001 and June 2001, respectively. Starting in September 2001, the Modeling Study Final Report, Air Emissions Final Report, and SWWYTAF Project Files were made available, upon written request to the Division, for industry, FLMs, and Tribes for their use in air quality related work.

The 2000 SWWYTAF Air Quality Modeling Project Review Report Recommendation reiterated the Division's continued commitment to the 1997 SWWYTAF Air Quality Modeling Project Review Report Recommendation as follows:

- track the impact of minor source growth on the Bridger and Fitzpatrick Wilderness Areas,

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<sup>30</sup> Section 1. W.S. 35-11-2214 is created to read: 35-11-214. Emission trading programs. The department through rule and regulation may establish intrastate, participate in interstate, or establish intrafacility emissions trading programs. Any trading program established shall be consistent with the Clean Air Act and regulations promulgated thereunder, and consistent with ambient air quality standards.

- perform PSD Class I NO<sub>2</sub> increment consumption analysis, which will then be used for future NO<sub>2</sub> increment tracking,
- analyze impacts from major PSD source applications,
- update the SWWYTAF emissions inventory to 1999 actual emissions, and
- utilize the SWWYTAF modeling system in developing emissions reduction strategies that will be implemented in Wyoming's Regional Haze SIP.

This 2000 Review Report recommendation stated that the final SWWYTAF model and results report must be in the Division's possession prior to initiating any future work based on the SWWYTAF modeling project. The Division is continuing its evaluation of the SWWYTAF model to determine the necessary baseline for future inventory and model work. It is important to note that the SWWYTAF model is a very complex model and that any future work based on the SWWYTAF model will be considerably time and resource intensive.

The Division continues to be committed to tracking the impact of minor source growth on the Bridger and Fitzpatrick Wilderness Areas and intends to perform a PSD Class I NO<sub>2</sub> increment consumption analysis using components of the SWWYTAF modeling system which will then be used for ongoing NO<sub>2</sub> increment tracking. The Division has and will use components of the SWWYTAF modeling system in analyzing impacts from major PSD source applications. The Division is also planning to update the emissions inventory to 2002 actual emissions and utilize components of the SWWYTAF modeling system in developing strategies that will be implemented in Wyoming's Regional Haze SIP.

### **5.3. ADDITIONAL VISIBILITY MONITORING**

As the Division continues to evaluate the requirements of the Regional Haze Rule, we are concerned that control strategies implemented on a regional basis are by necessity going to be driven by conclusions drawn from the output of extremely complex air quality models. More than ever before, the Division believes it is critical to have "reality checks" (i.e., actual monitored data) to evaluate that model output, as well as to be able to determine the success of any control strategies that may be implemented.

Wyoming's mandatory Federal Class I areas are primarily located in northwestern Wyoming and are "representatively" monitored through the efforts of IMPROVE at the Bridger, North Absaroka and Yellowstone sites. "Representative" monitoring has been defined by the IMPROVE Steering Committee as a monitoring site within 100 kilometers of a mandatory Federal Class I area and at an elevation between the maximum and minimum elevations of the mandatory Federal Class I area(s) it monitors. Therefore, the three IMPROVE sites satisfy the need for "representative" monitoring for all seven mandatory Federal Class I areas within Wyoming per the requirements of the Regional Haze Rule.

Baseline visibility conditions have been characterized for the southwest corner of the State through the GRBVS and southeast Wyoming will be monitored at the Brooklyn Lake IMPROVE Protocol site in the Snowy Range. Northeastern Wyoming, with the exception of the extensive particulate monitoring network in the PRB, has little available monitoring for gaseous or visibility-impairing pollutants. Consequently, the Division established two visibility monitoring stations at two Class II areas in Wyoming near the Cloud Peak Wilderness Area (in north central Wyoming) and at the Thunder Basin National Grasslands (in northeast Wyoming). At the request of the Division and in recognizing the value of the Cloud Peak and Thunder Basin stations to the national visibility monitoring effort, the IMPROVE Steering Committee approved the incorporation of the aerosol monitors at the stations into the IMPROVE network as IMPROVE Protocol sites.

The establishment of the Cloud Peak and Thunder Basin stations fulfills the 2000 Additional Visibility Monitoring Review Report Recommendation that the Division continue to assess the need for additional representative visibility monitoring to characterize visibility and identify pollutants, which may be contributing to visibility degradation in Class I and Class II areas within Wyoming. The establishment of the Cloud Peak and Thunder Basin stations was based on consultation with the U.S. Forest Service, National Park Service, industry, and the public.

#### **5.4. SMOKE MANAGEMENT PROGRAM**

The 2000 Review Report recommended that the Division continue the cooperative effort to develop a more mature smoke management program to better manage emissions from prescribed burning and address visibility impacts in Class I areas. As discussed in the Smoke Management Techniques section for Requirement VI, the cooperative effort stagnated when the development of a strawman smoke management plan by the Division suffered from continual delays due to staff resources and routine responsibilities.

Although the cooperative effort within Wyoming has stagnated, Division staff have been actively participating in the stakeholder based WRAP FEJF to develop several policies for the WRAP to assist the WRAP states and tribes in addressing emissions from wildland and agricultural fire sources. It is the Division's intent to build upon the consistent framework of the FEJF work products to efficiently develop programs related to fire for inclusion in Wyoming's Regional Haze SIP, long term strategies, and periodic progress reports. The Division will take into consideration the EPA Interim Policy, AAQTF Air Quality Policy, and WRAP Policies regarding fire during the development of a smoke management program to address public health, nuisance, and visibility. In developing programs related to fire for inclusion in Wyoming's Regional Haze SIP, the Division will build off of the previous cooperative effort and use a collaborative process that includes state, tribal, and land management agencies and private parties.

### **6. PUBLIC NOTIFICATION AND MEETINGS**

WAQSR Chapter 9, Section 2(f)(i)(A) requires the Division to consult with Federal Land Managers during the Long Term Strategy development and review process. To meet that requirement, the Division held a meeting with FLMs on March 3, 2003 at the Wyoming

Department of Environmental Quality, Air Quality Division office in Cheyenne. The FLM Meeting Agenda and FLM Mailing List may be found in Appendix C.

Public notices were placed in five newspapers throughout the State, between March 21 and March 24, 2003, announcing the Wyoming Air Quality Advisory Board (AQAB) meeting scheduled for April 22, 2003. The Division also provided notice of the April 22, 2003 Wyoming AQAB meeting with distribution of a News Release and Meeting Agenda to an extensive mailing list via mail and posting on the Wyoming Department of Environmental Quality website in the Air Quality section<sup>31</sup>. Appendix C contains copies of the public notice, news release, AQAB meeting agenda and corresponding distribution lists.

In accordance with Chapter 9, Section 2 Visibility of the WAQSR, the Division provided notice to the public advising them of the availability of the *Wyoming's Long Term Strategy for Visibility Protection, 2003 Draft Review Report* and providing for a public meeting before the Wyoming Air Quality Advisory Board and the Division on April 22, 2003 in Cheyenne, Wyoming. Public notices were placed in five newspapers throughout the State and a copy of the 2003 Draft Review Report was made available electronically via the Wyoming Department of Environmental Quality website in the Air Quality section. Appendix C contains copies of the public notice and corresponding distribution list.

As has been Division practice for the past Long Term Strategy reviews, the Division held a public meeting before the Wyoming Air Quality Advisory Board on April 22, 2003 during an afternoon session at 1:30 p.m. to provide the public with an opportunity to comment on any aspect of the 2003 Draft Review Report and visibility protection from reasonably attributable visibility impairment in Class I areas. The agenda for the Wyoming AQAB meeting is contained in Appendix C and a transcription of the afternoon session is available in Appendix D of the 2003 Review Report.

## **7. REVIEW AND RESPONSE TO COMMENTS**

Three written letters on the 2003 Draft Review Report were received from the National Park Service, U.S. EPA Region VIII, and the Wyoming Outdoor Council. Copies of all written comments are provided in Appendix H of this report. Oral questions and comments were also provided at the public meeting conducted by the Wyoming Air Quality Advisory Board on April 22, 2003 at 1:30 pm in Cheyenne. The public meeting was recorded and transcribed and a copy of those proceedings is provided in Appendix D.

The Division has reviewed all of the comments and provides the following analysis and responses to those comments. No specific response to comments supportive of the Wyoming Air Quality Division program and 2003 Draft Review Report are needed or provided.

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<sup>31</sup> [deq.state.wy.us/aqd/index.asp?pageid=8](http://deq.state.wy.us/aqd/index.asp?pageid=8)

## 7.1. FEDERAL LAND MANAGER COMMENTS

The United States Department of the Interior B National Park Service (NPS) provided comment on the 2003 Draft Review Report in its letter dated April 29, 2003 that was received on April 30, 2003.

### *Section 1.2. Long Term Strategy Review and Update*

The Division did not intend the uses of the term “plume blight” to limit the scope of the current reasonably attributable visibility protection SIP and Regulation. Rather, the term “plume blight” was intended to serve as an example of reasonably attributable visibility impairment. Your comments have resulted in the modification of the 2003 Review Report to reflect EPA’s description of reasonably attributable visibility impairment contained in the preamble to the Visibility Protection for Federal Class I Areas final rulemaking<sup>32</sup>.

Chapter 9, Section 1 Introduction to visibility impairment/PM fine control was effective October 29, 1999 as a basic introduction that was added during the restructuring of the Wyoming Air Quality Standards and Regulations from one chapter into thirteen chapters. When Chapter 9 is open for the rulemaking process to incorporate regulations to address regional haze visibility impairment in mandatory Federal Class I areas, the basic introduction in Section 1 will be modified appropriately.

The NPS cited definition of “visibility impairment” is a revised definition and “reasonably attributable visibility impairment” is a new definition in 40 CFR 51.301 effective August 30, 1999 as amended by 64 FR 35763-35774, July 1, 1999. The State’s current Visibility SIP and reasonably attributable visibility impairment regulation will be revised to address these definition changes, as well as other issues, when Wyoming revises the Visibility SIP to incorporate the regulatory requirements to address regional haze visibility impairment in mandatory Federal Class I areas.

### *Section 2.1. Requirement I*

In 1997, the Division received several comment letters on the Draft 1997 Review Report that stated that DEQ or the Division should certify that visibility impairment presently exists in Wyoming Class I areas based on personal visual observations and memories of the way it used to be. As a result, the 2000 Review Report and 2003 Draft Review Report have contained the language cited by the NPS from Section 2.1. By including this statement in the 2003 Review Report, the Division is not “constraining itself from certifying impairment based on visual observations” but rather stating that visual observations should be used as additional pertinent information to support visibility data, while relying on more objective techniques, that are to accompany any certification of reasonably attributable impairment. The Division is pleased, that as a practical matter, the NPS would provide the Division with all appropriate data and other relevant information, which may include modeling results, to support a certification of

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<sup>32</sup> 45 FR 80085 December 2, 1980.

reasonably attributable impairment. Further, the Division believes the NPS should consider such action to be within its “affirmative responsibility” to insure that those with the regulatory authority have the necessary information to address the right problem as expeditiously as possible.

The NPS is correct in noting that there is no comparable EPA requirement to that requirement specified in Chapter 9, Section 2 of the Wyoming rules for the Federal Land Manager to provide an analysis when making a certification of existing reasonably attributable impairment. The EPA approved the inclusion of this provision in Wyoming’s rules in the approval published in the Federal Register on February 15, 1989 under 40 CFR 52, however, the Division believes this to be an artifact of simpler times and that the language will be significantly modified or deleted when Wyoming’s Visibility SIP is revised in the near future. In the meantime, the Division also believes the issue is moot, since our respective agencies appear to have a mutual appreciation of the need to act cooperatively in addressing these potential issues.

While the Division appreciates that the NPS believes that the statement in the final paragraph of Section 2.1 is reasonable based on the scientific understanding of the visibility cause and effect relationship, the Division has no plans to further support the statement through state-of-the-art modeling demonstrations as suggested by the NPS. Rather, the Division is focusing its limited resources on state-of-the-art modeling demonstrations to support the development of control strategies to satisfy the requirements of the Regional Haze Rule.

### *Section 2.2. Requirement II*

The Division recognizes the increases in source growth discussed within the 2003 Review Report but exercises caution when labeling a three-year period as a trend of “increasing visibility impairment” as identified by the NPS at Yellowstone and Badlands National Parks since 1999. The Division exercises this caution because a three-year period may be too short a period to assess a definitive visibility trend due to the temporal variability of visibility as affected by factors such as meteorology and wildfire activity. Sections 2.5.1.3 and 5.2 discuss additional analysis to assess the air quality and visibility effects associated with source growth. While your comments and concerns relative to the potential for future visibility impacts resulting from minor source growth throughout the state are certainly valid, the Division would submit that those concerns are the specific focus of the Regional Haze Rule, which defines an impairment due to emissions from numerous sources over a wide geographic area. Although additional analysis is discussed in the 2003 Review Report, the Division believes that the additional analysis will prove more useful in addressing regional haze visibility impairment than reasonably attributable visibility impairment.

Your comments have resulted in the modification of the 2003 Review Report (see Sections 2.2.1.5. and 2.6.1.) to reflect the substantive elements of the Division’s review of impact from new or modified sources in accordance with WAQSR Chapter 9, Section 2(e). Please refer to Section 2.2.1.3 for information regarding the application of best available control technology through the major and minor source New Source Review Program’s permitting process.

The Division recognizes that there have been some procedural issues in the past with respect to PSD permit coordination with the FLMs. However, the commitment by the Division, although not required by regulation, of formal notification to the FLM when a completeness determination has been made, and the transmission of any additional information received from the applicant during the completeness review period should help to resolve past procedural issues. Certainly, the Division is willing to discuss better coordination between our agencies, however, the NPS must realize that “what the FLM needs and when it is needed” to meet your “affirmative responsibility” must also be compatible with our regulatory requirements for permit application review, and within our statutory authority to implement.

The current PSD regulations in the Wyoming Air Quality Standards and Regulations Chapter 6, Section 4 Prevention of Significant Deterioration do not require applicants to conduct a cumulative assessment of impacts on visibility and AQRVs. The rule requires an assessment of impact on visibility and AQRVs from the proposed source. The Wyoming PSD rule is consistent with EPA rule and is a SIP approved regulation. The Division also reviewed your citation of EPA’s interpretation in this matter in the July 12, 1985 Federal Register. Wyoming is not persuaded that frequent repetition of a conclusion that is contrary to the plain language of the regulation adds any increased validity to the point being made whether it is assessment of adverse visibility impacts or any other issue.

The Division considers the recommendation for PSD cumulative visibility analysis from the *Federal Land Managers’ Air Quality Related Values Workgroup (FLAG) Phase I Report* dated December 2000 to be inconsistent with the current Federal PSD regulations and current WAQSR Chapter 6, Section 4. The Division is concerned that this issue, which the Division recognizes as relevant in the year 2003, is being incorporated into guidance that is inconsistent with the 1979 PSD regulation. The Division considers it appropriate to address this issue by regulatory action, but completely inappropriate to address through a guidance document. The Division recognizes the *Federal Land Managers’ Air Quality Related Values Workgroup (FLAG) Phase I Report* as guidance, but will not implement those recommendations that are inconsistent with current PSD and permitting regulations or implement recommendations that are proposed as PSD rule changes until such time as the Federal PSD regulation revisions are final.

As identified in Section 2.2.3.1, the data from Wyoming’s Visibility Monitoring Network has been and will be utilized to characterize the extent, frequency of occurrence, and magnitude of visual air quality. Additionally, data has been utilized to perform annual visibility monitoring data assessments and presentations to Wyoming’s Air Quality Advisory Board on the topic of visibility. The Division will also be using the data to make future decisions about air quality and visibility in Wyoming, as well as in the development of Wyoming’s Regional Haze SIP. The primary focus for data obtained from the Wyoming Visibility Monitoring Network is to provide for “reality checks” to compare against as we, collectively, exercise complex air quality modeling tools of indeterminate accuracy to evaluate PSD actions, conduct Federal NEPA actions, and evaluate the potential effectiveness of control strategies in reducing visibility impacts.

The Division's active involvement in the preparation of NEPA air quality analyses for EISs for projects within Wyoming stems from the Division's desire to ensure that the most appropriate information and models are used, and not from a regulatory requirement to do so. The WAQSR do not authorize the Division to take into consideration EISs prepared to meet NEPA requirements when reaching a permit decision. However, the Division does recognize the beneficial role that EISs have played in Wyoming by utilizing the more sophisticated and realistic CALMET/CALPUFF modeling system to predict visibility and acid deposition impacts at Class I areas and intends to continue to be actively involved in the preparation of EIS air quality analyses.

### *Section 2.3. Requirement III*

Section 2.3 not only contains conclusions based on the IMPROVE long term trends (1988-1998) but also includes conclusions based on data collected within the IMPROVE network from 1989 through 2001 and at the GRBVS site from 1997 through 2000. Several of the conclusions presented in Section 2.3 are based on the most recent visibility data analyzed, 2001, which can be interpreted to be "an assessment of existing conditions." However, your comments have resulted in the modification of the 2003 Review Report to emphasize the "assessment of existing conditions" as well as the inclusion of conclusions specific to "any change in visibility since the last such report."

As there has been no certification of reasonably attributable visibility impairment, the Division does not believe that it is appropriate for the 2003 Review Report to include a source-attribution discussion as suggested by the NPS. Rather, the general source list associated with each aerosol species, contained in the Visibility Monitoring Data Assessment within Appendix E, serves as a list of probable sources that contribute to visibility impairment from within and outside the State of Wyoming.

### *Section 2.4. Requirement IV*

A rulemaking action would be necessary to replace or update the 1987 Visibility SIP for Class I Visibility Protection and WAQSR Chapter 9, Section 2. The 2003 Review Report is not a rulemaking action and cannot change the substantive plan elements under the SIP. However, the 2003 Review Report can, and does, address changes that have occurred since 1987 (i.e., non-substantive plan elements) and, while not incorporated into the SIP, either directly or by reference, serves as a review and update of the Long Term Strategy in the 1987 SIP. The Visibility SIP and WAQSR Chapter 9 will be revised when the regional haze SIP and rulemaking process are underway to address regional haze visibility impairment in mandatory Federal Class I areas. This will result in a comprehensive and up-to-date visibility protection program for reasonably attributable and regional haze visibility impairment for the State of Wyoming.

### *Section 2.6. Requirement VI*

Your comments have resulted in the modification of the 2003 Review Report (see Sections 2.2.1.5. and 2.6.1.) to reflect the substantive elements of the Division's review of impact from new or modified sources in accordance with WAQSR Chapter 9, Section 2(e).

## **7.2. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY COMMENTS**

The United States Environmental Protection Agency (EPA) Region VIII provided comment on the 2003 Draft Review Report in its letter dated April 16, 2003, which was received via facsimile on April 16, 2003 and via mail on April 23, 2003.

### *Section 1.3. Regional Haze Regulation*

The Division agrees with the EPA's interpretation stated in their comment regarding Section 1.3. The Division will continue to perform the Long Term Strategy review and report for reasonably attributable visibility impairment every three years, as required by WAQSR Chapter 9, Section 2, until the Wyoming Regional Haze SIP is submitted to and approved by EPA. After submittal of Wyoming's Regional Haze SIP, Long Term Strategy reviews for reasonably attributable and regional haze visibility impairment would be combined and conducted every five years, as required by the Regional Haze Rule.

### *Section 2.3. Requirement III*

To date, reasonably attributable visibility impairment has not been certified at Badlands Wilderness Area<sup>33</sup> or Wind Cave National Park in South Dakota. The focus of Wyoming's Long Term Strategy, by regulation, is on reasonably attributable visibility impairment. Provisions for the protection from reasonably attributable visibility impairment in South Dakota's mandatory Federal Class I areas, Wind Cave National Park and Badlands Wilderness Area, are part of a Federal Implementation Plan for the State of South Dakota as identified in 40 CFR 52.2179. The State of Wyoming has not been advised by EPA, as a result of any Long Term Strategy reviews EPA may have conducted for visibility protection for the Wind Cave National Park and Badlands Wilderness Area, that there is any potential attribution to Wyoming sources. As there has been no certification of reasonably attributable impairment by any agency at either of these South Dakota Class I areas, the Division does not believe that it is appropriate for the 2003 Review Report to include a source-attribution discussion as suggested by the EPA.

EPA, by necessity, employed a phased approach to visibility protection. Phase I addresses reasonably attributable visibility impairment. Phase II addresses regional haze visibility impairment. The phase II of visibility protection for Wyoming will be addressed through the submission of a Regional Haze SIP to EPA, potentially as early as December 31, 2003, but no later than December 31, 2008, as required by the Regional Haze Rule. Regional Haze SIPs are to be prepared for every state and must evaluate impacts to not only mandatory Federal Class I

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<sup>33</sup> The U.S. Congress designated the Wilderness Area portion of Badlands National Park as a Mandatory Federal Class I area.

areas within the state but to mandatory Federal Class I areas in other states as well. Unless reasonably attributable visibility impairment is certified at Wind Cave National Park or Badlands Wilderness Area, it is anticipated that the visibility impairment at those two mandatory Federal Class I areas will be addressed in Regional Haze SIPs for a number of states that may contribute to that impairment.

#### *Section 2.5. Requirement V*

The Division concurs with EPA that the 10% value that is attributed to sources within the SWWYTAF modeling domain is “highly uncertain.” That is why in Section 2.5.1.1 of the 2003 Review Report the Division states that “... the CALPUFF model may have more uncertainty than is portrayed in the analysis due to questions surrounding the representativeness of the boundary condition sources ... while the percentages above may not be exact ...”. The Division also agrees that even if the 10% value were completely accurate, impairment from local sources may represent a significant contribution. However, the Division must remind EPA that we are speaking here of potential impairment, not from a Navajo Generating Plant, but from numerous minor sources located over a wide geographical area; i.e., regional haze.

The Division has not, and will not, prejudge the impact of recent and projected emissions increases and decreases from Wyoming sources on visibility in the Bridger and Fitzpatrick Wilderness Areas based solely on modeling analyses. The true test of whether or not visibility is undergoing an increased level of impairment should rest on the monitoring data, which reflects the actual visibility impacts due to emissions increases and decreases not only within Wyoming but from sources in other states as well. Based on all of the information contained in the 2003 Review Report, the Division believes that a cumulative analysis for the year of maximum development may find that impairment cannot be attributed to specific sources and therefore cannot be addressed under the existing reasonably attributable visibility regulation but rather should be addressed under the regional haze regulation.

EPA is incorrect in assuming that the scope of the EIS air quality analyses do not include emissions changes from other permitted sources such as power plants and trona facilities. In Wyoming, air quality analyses for EISs take into account not only the proposed project (e.g., natural gas development), but also take into account monitored background levels of pollutants, visibility and acid deposition as well as sources that have been issued NSR permits and other reasonably foreseeable development projects that have been authorized through the NEPA process since the background levels data was monitored. EPA is correct, however, in its statement that the scope of the EIS air quality analyses do not include emission changes from sources such as urban growth and mobile sources, which is typical for NEPA air quality analyses. While this may be an issue of significance for an urban area such as Denver relative to impairment at Rocky Mountain National Park, it is less so in Wyoming. Between 1995 and 2000, population within the State of Wyoming experienced a very modest increase of 2.8 percent, while for the southwest Wyoming communities inventoried for the SWWYTAF study, the statistics show a 20.6 percent population decrease for the same period. The WRAP mobile source inventory for 1996 and projections for the years 2003, 2008, 2013, and 2018 reflect that even as vehicle travel increases, cleaner vehicles and fuels will result in continued reductions in vehicle pollutant emissions. For the State of Wyoming, total mobile emissions (i.e., on-road plus off-

road) of VOC, NO<sub>x</sub>, PM<sub>10</sub>, and SO<sub>2</sub> were inventoried in 1996 to be 318 tons per day, were projected to increase to 319 tons per day in 2003, and then decrease to 253 tons per day in 2008, 223 tons per day in 2012, and 209 tons per day in 2018.

While the modeling domain for NEPA air quality analyses may not always coincide with what is necessary for a regulatory modeling exercise, the CALMET modeling domain for the Pinedale Anticline EIS was defined to be the same as the SWWYTAF modeling domain and the CALPUFF modeling domain for the Pinedale Anticline EIS was defined to be Wyoming border on the south and west and the CALMET domain boundaries on the north and east. Therefore, the modeling domain for the Pinedale Anticline EIS is consistent with the modeling domain that would be utilized for any additional regulatory analysis utilizing components of the SWWYTAF model.

The results from the Pinedale Anticline EIS cited in Section 2.5.1.2 are the predicted visibility impacts prior to the consideration of the NO<sub>x</sub> emissions reductions planned for the PacifiCorp Naughton power plant. Therefore, the predicted visibility impacts discussed in the report were not “offset” by the Naughton reductions. It is presumptive at this point in time to assume that, in the future, emissions growth in southwest Wyoming would surpass the NO<sub>x</sub> emissions reductions that resulted from the voluntary installation of low NO<sub>x</sub> burners on Unit 3 at the PacifiCorp Naughton power plant, which was completed in May of 1999. Additionally, it is worth noting that while permit MD-403 issued April 28, 1999 recognized an actual emissions reduction of 1,000 tons per year NO<sub>x</sub> below the 1996/1997 actual emissions levels from Units 1, 2 and 3 combined, the 2000/2001 actual emissions levels were 3,765 tons per year below the 1996/1997 actual emissions levels.

#### *Section 2.6.5. Adequacy of Long Term Strategy*

While the Division has concluded that Wyoming’s Long Term Strategy, Visibility SIP, WAQSR Chapter 9, Section 2 along with WAQSR Chapter 6, Section 2 and 4 are adequate for making reasonable progress toward the national visibility goal of remedying existing and preventing future impairment that can be attributed to a source or small group of sources, the Division also recognizes that there is work yet to be done. The existing Visibility SIP is directed primarily at major stationary sources. Even EPA, in approving Wyoming’s Visibility SIP, indicated that it was “aware that it, or the State, may find that the impairment cannot be attributed to specific sources and therefore cannot be addressed under the existing visibility regulations.” The promulgation of the Regional Haze Rule has provided the necessary additional regulatory framework and emphasis on regional approaches to addressing uniform or regional haze visibility impacts from all sources, including area and mobile sources.

Sections 2.5.1.3 and 5.2 of the 2003 Review Report discuss the Division’s plans for additional analysis to assess the air quality and visibility effects associated with source growth. The Division encourages EPA to look beyond dated commitments of questionable value. The SWWYTAF project was “the state of the art” at the time, and the CALPUFF/CALMET modeling system is a recognized tool of choice today. The State of Wyoming has a comprehensive strategy in place, which will allow us to definitively address the issues of increment consumption, visibility impacts due to source growth, and effective control strategies.

This comprehensive strategy includes the installation and operation of visibility monitoring stations, additional ambient monitors located in significant development areas to monitor potential ambient impacts, development of a current statewide actual and potential emissions inventory, as well as baseline inventories for all increment consuming pollutants, and a statewide up-to-date CALMET windfield for use in detailed analyses utilizing the CALPUFF modeling system. While the Division is averse to commit to an updated schedule for the additional analysis as identified in EPA's comments, the Division is certainly willing to work with EPA to insure that the analyses are completed as expeditiously as possible.

### **7.3. ENVIRONMENTAL ORGANIZATION COMMENTS**

The Wyoming Outdoor Council (WOC) provided comment on the 2003 Draft Review Report in its letter dated April 30, 2003, which was received via facsimile on April 30, 2003 and via mail on May 2, 2003. For the most part, WOC's comments focused on the protection of visibility from regional haze impairment rather than reasonably attributable impairment. As the focus of Wyoming's existing Visibility SIP and WAQSR Chapter 9, Section 2 is on reasonably attributable visibility impairment; WOC's comments have not resulted in the modification of the 2003 Review Report. The Division suggests that WOC become involved in the public process of adopting rules and developing the plan to address regional haze visibility impairment, which is the appropriate avenue to address their comments on regional haze.

#### *1. The State's Long Term Strategy Review Does Not Ensure Prevention of Future Visibility Impairment Due to Industrial Growth in Southwest Wyoming*

Of the future oil and gas development projects in southwest Wyoming cited in WOC's comment letter, only one (Desolation Flats) has completed an air quality analysis that is more current than the Pinedale Anticline EIS air quality analysis at this point in time. The Desolation Flats Draft EIS was just released on April 25, 2003 and as such has not yet been subject to the NEPA public review and approval process. Although, the Desolation Flats Draft EIS was just recently released, the emissions inventory utilized for the air quality analysis utilized a cut-off date of December 31, 2000. The Desolation Flats project emissions alone result in estimated visibility impacts less than a 0.5 or 1.0 deciview change. The cumulative impact analysis estimated that a change of 1.0 deciview would be exceeded on 5 days and a change between 0.5 and 1.0 deciview would occur on 4 days at the Bridger Wilderness Area. There are no conclusive statements regarding the significance of the cumulative visibility impacts presented within the Desolation Flats Draft EIS.<sup>34</sup>

As the majority of the other oil and gas development projects cited in WOC's comment letter are in the process of developing or finalizing air quality analysis protocols, the air quality impacts associated with the projects are unknown and won't be quantified prior to the finalization of the 2003 Review Report. Therefore, the Pinedale Anticline EIS air quality analysis is the most up-to-date cumulative visibility impact assessment that has been conducted in southwestern Wyoming and gone through the NEPA public review and approval process.

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<sup>34</sup> Bureau of Land Management, U.S. Department of Interior, Draft Environmental Impact Statement, Desolation Flats Natural Gas Field Development Project, Sweetwater and Carbon Counties, Wyoming; Rawlins and Rock Springs Field Offices, April 2003.

WOC is correct in its statement that the scope of the Pinedale Anticline air quality analyses does not include emissions changes from mobile sources, which is typical for NEPA air quality analyses. However, the WRAP Mobile Source inventory for 1996 and projections for the years 2003, 2008, 2013 and 2018 reflect that even as vehicle travel increases, cleaner vehicles and fuels will result in continued reductions in vehicle pollutant emissions. For the State of Wyoming, total mobile emissions (i.e., on-road plus off-road) of VOC, NO<sub>x</sub>, PM<sub>10</sub>, and SO<sub>2</sub> were inventoried in 1996 to be 318 tons per day were projected to increase to 319 tons per day in 2003 and then decrease to 253 tons per day in 2008, 223 tons per day in 2012, and 209 tons per day in 2018.

While the cumulative air quality analyses estimated visibility impacts greater than a 0.5 deciview change but less than a 1.0 deciview change, WOC is incorrect in stating that "... visibility would be impaired as a result of the oil and gas development contemplated in that [Pinedale Anticline] EIS." The estimated visibility impacts due to the Pinedale Anticline Natural Gas Development project alone were not predicted to exceed a 0.5 or 1.0 deciview change.

Since development of oil and gas or coal bed methane development projects constitute many small air pollutant emission sources spread out over a very large area, discrete visible plumes are not likely to affect the Class I areas, but the potential for cumulative visibility impacts (increased regional haze) is a concern that is addressed in NEPA air quality analyses. Unlike PSD visibility impact analyses, NEPA air quality analyses are not designed to estimate specific visibility impacts for specific mandatory Federal Class I areas based on specific project designs, but to characterize reasonably foreseeable visibility conditions that are representative of a fairly broad geographic region. This approach is consistent with both the nature of regional haze and the requirements of NEPA.

Although it is not possible to predict future levels of oil and gas or coal bed methane development within Wyoming with any degree of certainty, it is not anticipated that energy development will stagnate. Therefore, it is unrealistic to assume that given the amount of time that it takes to conduct a cumulative air quality analysis within the State of Wyoming that a cumulative air quality analysis will ever be completely "up-to-date" as desired by WOC. Due to practicable considerations, it is also unrealistic to expect that a cumulative air quality analysis will be completed for the entire State of Wyoming at the fine resolution utilized for NEPA air quality analyses. Further, the true test of whether or not visibility is undergoing an increased level of impairment should not rest on the modeling predictions but on the monitoring data, which reflects the actual visibility impacts due to emissions increases and decreases not only within Wyoming but from sources in other states as well.

The Division agrees with WOC that the application of any visibility impairment significance threshold, including those utilized by FLMS, is not supported in the visibility regulations or case law. Rather, they are used as an indication that potential visibility impacts may exist and that factors such as the modeling analysis assumptions, magnitude of the deciview change, frequency, time of year, and the meteorological conditions during times when there are predicted visibility impacts can and should all be considered when assessing the significance of predicted impacts.

Sections 2.5.1.3 and 5.2 discuss the Division's plans for additional analysis to assess the air quality and visibility effects associated with source growth. The SWWYTAF project was "the state of the art" at the time, and the CALPUFF/CALMET modeling system is a recognized tool of choice today. The State of Wyoming has a comprehensive strategy in place, which will allow us to definitively address the issues of increment consumption, visibility impacts due to source growth, and effective control strategies. This comprehensive strategy includes the installation and operation of visibility monitoring stations, additional ambient monitors located in significant development areas to monitor potential ambient impacts, development of a current statewide actual and potential emissions inventory, as well as baseline inventories for all increment consuming pollutants, and a statewide up-to-date CALMET windfield for use in detailed analyses utilizing the CALPUFF modeling system. The Division must point out that the majority of WOC's comments relative to industrial growth in southwest Wyoming are related to concerns of potential impacts due to oil and natural gas development, which is potential impact from numerous minor sources located over a wide geographical area; i.e., the definition of regional haze. The Division is not "shirking its responsibility to assess and prevent potential future visibility impairment." Rather, the Division is following the phased regulatory approach for visibility protection as mandated by EPA and the Federal visibility regulations. As mentioned several times throughout the 2003 Review Report, the development and implementation of a Regional Haze SIP will play a key role in future measures for making reasonable progress toward the national visibility goal of remedying existing and preventing future impairment. In addition, Wyoming's experiences in SWWYTAF and NEPA air quality analyses indicates that resolution of regional haze visibility impacts to mandatory Federal Class I areas demands a regional approach, including a consistent emissions inventory, a common modeling tool, and an extensive monitoring network to provide the necessary "reality checks" for modeled outputs.

## *2. Wyoming's Long Term Strategy Fails to Address the Future Wyoming Sources' Contribution to Visibility Impairment in South Dakota's Class I Areas*

EPA, by necessity, employed a phased approach to visibility protection. Phase I addresses reasonably attributable visibility impairment. Phase II addresses regional haze visibility impairment. In accordance with EPA's phased approach to visibility protection, the focus of the existing Wyoming's Visibility SIP and WAQSR Chapter 9, Section 2 is on reasonably attributable visibility impairment (i.e., phase I) and to date, reasonably attributable visibility impairment has not been certified at Badlands Wilderness Area<sup>35</sup> or Wind Cave National Parks in South Dakota.

Provisions for the protection from reasonably attributable visibility impairment in South Dakota's mandatory Federal Class I areas, Wind Cave National Park and Badlands Wilderness Area, are part of a Federal Implementation Plan for the State of South Dakota as identified in 40 CFR 52.2179. The State of Wyoming has not been advised by EPA, as a result of any Long Term Strategy reviews EPA may have conducted for visibility protection for the Wind Cave National Park and Badlands Wilderness Area, that there is any potential attribution to Wyoming sources.

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<sup>35</sup> The U.S. Congress designated the Wilderness Area portion of Badlands National Park as a Mandatory Federal Class I area.

The phase II of visibility protection for Wyoming will be addressed through the submission of a Regional Haze SIP to EPA, potentially as early as December 31, 2003, but no later than December 31, 2008, as required by the Regional Haze Rule. Regional Haze SIPs are to be prepared for every state and must evaluate impacts to not only mandatory Federal Class I areas within the state but to mandatory Federal Class I areas in other states as well. Unless reasonably attributable visibility impairment is certified at Wind Cave National Park or Badlands Wilderness Area, it is anticipated that the visibility impairment at those two mandatory Federal Class I areas will be addressed in Regional Haze SIPs for a number of states that may contribute to that impairment. The State of Wyoming and the State of South Dakota are both members of the Western Regional Air Partnership, a regional planning organization of western states and tribes that are working together to produce coordinated multi-state, regional solutions to reduce emissions of visibility-impairing pollutants for integration into Regional Haze SIPs.

Visibility monitoring data collected at South Dakota's mandatory Federal Class I areas was included by the Division in the Visibility Monitoring Data Assessment within Appendix E. Your comments have resulted in the modification of the 2003 Review Report to reflect the long term visibility trend at Badlands National Park.

### *3. Wyoming's Long Term Strategy Review Lacks an Analysis for Remediating Existing Visibility Impairment*

The Wyoming Outdoor Council comments take the FLM 1985 certification of visibility impairment in all Class I areas out of context. The actual text of 52 Federal Register 45133 (November 24, 1987) reads

“In its response, the Department of the Interior certified the existence of uniform haze in all Class I areas in the lower 48 States. However, the information provided is inadequate to enable EPA to determine that this impairment could be traced to any specific source and thus addressable under the existing visibility regulations. Therefore, EPA proposed that BART or other control strategies were not necessary in the FIP's for 28 States.” (Emphasis added)

The 2003 Review Report recognizes the general certification of visibility impairment due to uniform haze provided by the National Park Service, for all of its areas in the lower 48 states, to EPA in November of 1985. The 2003 Review Report also states that since adoption of Wyoming's Visibility SIP and regulation, neither the FLMs nor the Division has certified that visibility impairment, that can be attributed to a source or small group of sources, exists in any Class I area pursuant to the provisions of Chapter 9, Section 2 of the WAQSR.

Wyoming's Long Term Strategy focuses on reasonably attributable visibility impairment not uniform or regional haze visibility impairment, as directed by WAQSR Chapter 9, Section 2 in accordance with EPA's phased approach to visibility protection. As reasonably attributable visibility impairment has not been certified, there are no required emission reduction plans that would require the installation of BART to major operating sources or other additional measures to remedy existing visibility impairment. Uniform or regional haze visibility impairment will be

addressed in a Regional Haze SIP, which is to be submitted to EPA, potentially as early as December 31, 2003, but no later than December 31, 2008 in accordance with the Regional Haze Rule. The Regional Haze SIP will consider impairment from all groups of sources, not just stationary sources, not only within Wyoming but in other states as well. The Division maintains that the appropriate regulation and SIP to address uniform or regional haze visibility impairment is through the Regional Haze Rule not under the existing reasonably attributable visibility impairment regulation and SIP, which is consistent with EPA's phased approach to visibility protection

#### *4. Wyoming's Long Term Strategy Review Fails to Fully Consider All Measures that Appear to be Necessary to Prevent Future Visibility Impairment*

The Division appreciates WOC's expression of support for Wyoming's application of strict BACT requirements to minor sources associated with coal bed methane and natural gas development, but is puzzled by WOC's apparent belief that the Division somehow approaches BACT differently for minor sources than we do for major sources, like the Black Hills Corporation WYGEN 2 power plant. BACT is a process, not a number, and the Division rigorously applies the process in every case. The Division also recognizes that although by application of BACT to minor sources we have reduced potential growth impacts to a half or a third of what they may have been without that process, there is still growth. The Division maintains, however, that once we have fully developed the comprehensive (i.e., reasonably attributable and regional haze) visibility protection program discussed previously, the Division will have the means to effectively address both growth and the national visibility goals.

## **8. RECOMMENDATIONS**

The following is a brief summary of the 2003 Review Report recommendations. For related discussions, the reader is referred to discussions within the report.

- *Regional Haze*

The Division recommends continued participation in the WRAP to produce coordinated multi-state, regional solutions for such things as emission inventory development, modeling protocols and emission reduction strategies that will assist Wyoming in the development of its Regional Haze SIP. The Division will develop and submit a Regional Haze SIP potentially as early as December 31, 2003 but no later than December 31, 2008, depending on the plan option chosen as required by the rule. This SIP will play a key role in future measures to remedy regional haze visibility impairment in Wyoming's mandatory Federal Class I areas. The process to develop a SIP and regulations to meet the requirements of the Regional Haze Rule will be initiated in the near future. The Division encourages those concerned about regional haze visibility impairment to become involved in the public process of adopting rules and developing the plan to address regional haze visibility impairment.

- *Visibility SIP and Regulation Revisions*

The Division recommends that the State of Wyoming's current Visibility SIP and WAQSR Chapter 9 for reasonably attributable visibility impairment be revised when the regional haze SIP and rulemaking process are underway to address regional haze visibility impairment in mandatory Federal Class I areas. This will result in a comprehensive and up-to-date visibility protection program for reasonably attributable and regional haze visibility impairment for the State of Wyoming.

- *Air Quality Modeling Analysis*

Upon completion of a comprehensive baseline and current emissions inventory, the Division should initiate tracking the impact of minor source growth on the Bridger and Fitzpatrick Wilderness Areas and perform a PSD Class I NO<sub>2</sub> increment consumption analysis using components of the SWWYTAF modeling system, which will then be used for ongoing NO<sub>2</sub> increment tracking. The Division will continue to use components of the SWWYTAF modeling system in analyzing impacts from major PSD source applications. The Division recommends updating the emissions inventory to 2002 actual emissions and utilize components of the SWWYTAF modeling system in developing strategies that will be implemented in Wyoming's Regional Haze SIP.

- *Smoke Management Program*

The Division recommends continued participation in the WRAP FEJF to address both policy and technical issues concerning smoke effects that are caused by wildland and agricultural fires on public, tribal, and private lands. The Division will build upon the consistent framework of the WRAP FEJF work products to efficiently develop programs related to fire for inclusion in Wyoming's Regional Haze SIP, long term strategies, and periodic progress reports. The Division will take into consideration the EPA *Interim Air Quality Policy on Wildland and Prescribed Fires*, the Agricultural Air Quality Task Force's Recommendation on *Air Quality Policy on Agricultural Burning*, and WRAP Policies regarding fire during the development of a smoke management program to address public health, nuisance, and visibility. In developing programs related to fire for inclusion in Wyoming's Regional Haze SIP, the Division will build off of the previous cooperative effort and use a collaborative process that includes state, tribal, and land management agencies and private parties.

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