Chapter Seven -- Long-Term Strategy for Nevada

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7.1 LONG-TERM STRATEGY OVERVIEW

The long-term strategy is the compilation of enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals and is the means through which the state ensures that its reasonable progress goal (RPG) will be met (40 CRF 51.308(d)(3) and *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program*, U.S. EPA, 2007). This chapter discusses Nevada's long-term strategy to restore natural visibility conditions at the Jarbidge Wilderness Area (Jarbidge WA) by 2064 and its relationship to the RPG for the Jarbidge WA.

The long-term strategy must have the capability of addressing existing and future impairment situations as they face the state. Generally, Nevada considers its permitting program meets this requirement for existing major stationary facilities, as well as preventing future impairment from proposed major stationary sources or major modifications to existing facilities. The New Source Review (NSR) and Prevention of Significant Deterioration (PSD) programs are key components of Nevada's regional haze plan designed to improve current visibility on the most impaired days and to protect visibility conditions at Class I areas. The state maintains that its existing regulations, including the Best Available Retrofit Technology (BART) regulations adopted for this SIP, along with the strategies and activities outlined in Chapter Six and below provide for reasonable progress toward the national visibility goal.

The starting point for the identification of additional emission control strategies is the visibility improvement achieved as a result of BART and the implementation of other Clean Air Act (CAA) programs, including measures for attainment of the ozone and $PM_{2.5}$ National Ambient Air Quality Standards. Implementation of some of these CAA control programs was incorporated into the PRP18a emissions inventory and modeling scenario, as was some of the implementation of BART. These programs are described in Chapter Six. Other CAA programs and emissions reduction strategies are described below.

7.1.1 Long-Term Strategy Requirements

USEPA regulations require the state to: 1) develop a long-term strategy; 2) coordinate its long-term strategy with existing plans and goals, including those of FLMs, which may affect impairment in any Class I area; 3) demonstrate why the long-term strategy is adequate for making reasonable progress toward the national goal and state why the minimum factors (listed in the next paragraph) were or were not addressed in developing the long-term strategy; 4) consider the time necessary for compliance as well as the economic, energy, and non-air quality environmental impacts of compliance, the remaining useful life of any affected existing source, as well as the effect of new sources; 5) review its strategy no less frequently than every three years and consult with FLMs during this process; and 6) report to USEPA and the public on progress achieved toward the national visibility goal.

During the development of the long-term strategy the state must consider, at a minimum, the following six factors: 1) emissions reductions due to ongoing air pollution control programs; 2) measures to mitigate the impacts of construction activities; 3) additional emissions limitations

and schedules for compliance; 4) source retirement and replacement schedules; 5) smoke management techniques for agricultural and forestry management purposes, including such plans as currently exist within the state for this purpose; and 6) enforceability of emission limitations and control measures. The long-term strategy for regional haze must also address the anticipated net effect on visibility due to projected changes in point, area and mobile source emissions over the period addressed by the long-term strategy.

7.1.2 Technical Basis of Reasonable Progress Goal

NDEP has used the analyses of monitoring, emissions and modeling data in developing Nevada's long-term strategy. Many of the tools and resources used in these analyses were produced by the Western Regional Air Partnership (WRAP) and its contractors and are discussed elsewhere in this document. The analyses discussed in Chapters Two, Three and Four describe the monitoring, emissions, and modeling information and analyses on which Nevada is relying to determine the emissions reductions necessary to achieve reasonable progress toward the national visibility goal by 2018. These analyses provide the technical basis of our long-term strategy.

7.2 BART CONTROLS

The installation of BART controls is an integral part of the long-term strategy and RPG of Nevada's regional haze SIP. Chapter Five describes the BART process, identifies Nevada's seven BART-eligible sources and presents the BART requirements for Nevada's four subject-to-BART facilities. Each source subject to BART is required to install and operate BART as expeditiously as practicable, but in no event later than January 1, 2015 or 5 years after USEPA approval of the implementation plan, which ever occurs first. In addition, each source subject to BART is required to establish procedures to ensure the control equipment is properly operated and maintained.

Seven Nevada facilities were identified as BART eligible: NV Energy's generating stations at Tracy, Fort Churchill, Reid Gardner and Sunrise; Southern California Edison's generating station at Mohave; Nevada Cement Company's Fernley facility; and Chemical Lime Company's facility in Apex, Nevada. Four of these facilities were determined to cause or contribute to visibility impairment at a Class I area and were subject to full BART determinations. These facilities are Fort Churchill, Tracy, Reid Gardner, and Mohave.

Significant emissions reductions will be achieved by the installation of BART controls on these four facilities. Table 7-1 summarizes the emissions reductions resulting from the installation of BART control technologies beyond those incorporated in the PRP18a emissions inventory. These emissions reductions raise the overall reduction from the baseline to 2018 in Nevada's NO_x inventory to 32.9 percent from 16.8 percent and the reduction in the SO_2 inventory to 44.0 percent from 33.0 percent.

TABLE 7-1

ADDITIONAL ANNUAL EMISSIONS REDUCTIONS IN TONS RESULTING FROM IMPLEMENTATION OF BART IN NEVADA

NO_x	SO_x	PM_{10}	Total
26,477	7,611	1,360	35,448

7.3 VISIBILITY IMPROVEMENT

Utilizing WRAP Regional Modeling Center (RMC) modeling results, Nevada has estimated the expected visibility improvements by 2018 at the Jarbidge WA. Two projected 2018 emissions inventories were utilized by RMC, Base18b and PRP18a, to project visibility improvement. These inventories are more fully discussed in Chapter Three.

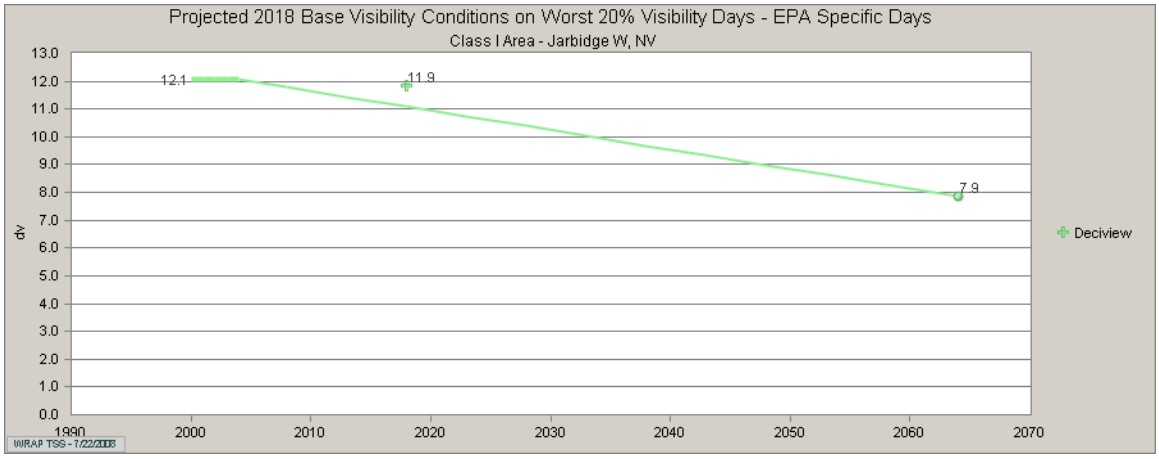
The Base18b inventory included emission reductions due to known controls (i.e., implementation of existing federal and state regulations), consent decree reductions, existing SIP control measures and other relevant regulations that have gone into effect since 2002 or will go into effect before the end of 2018. These controls do not include impacts from any future control scenarios that have yet to be determined, such as the installation of BART.

Figure 7-1 shows the projected 2018 visibility conditions for the worst days at JARB1 resulting from the controls included in the Base18b emissions inventory. The projected visibility is 11.85 dv, reflecting the 0.22 dv or 1.8 percent decrease from baseline visibility conditions resulting from the implementation of existing regulations.

The PRP18a inventory refined the Base18b inventory by applying presumptive BART SO_2 emission limits to BART-eligible coal-fired electric generating unit (EGUs) greater than 750 MW across the WRAP region. BART NO_x limits were not incorporated into this inventory. Other, less significant refinements to the PRP18a inventory are described in Chapter One, section 1.3.2.2. Figure 7-2 shows the modeled 2018 visibility projection of 11.05 deciviews (dv), a 1.02 dv or 8.45 percent reduction in visibility impairment. These results suggest the full implementation of BART across the WRAP-region will result in additional and noticeable improvement of visibility impairment at the Jarbidge WA for the worst days.

FIGURE 7-1

CMAQ 2018 WORST DAYS MODEL PROJECTIONS FOR JARB1
USING BASE18b EMISSIONS INVENTORY



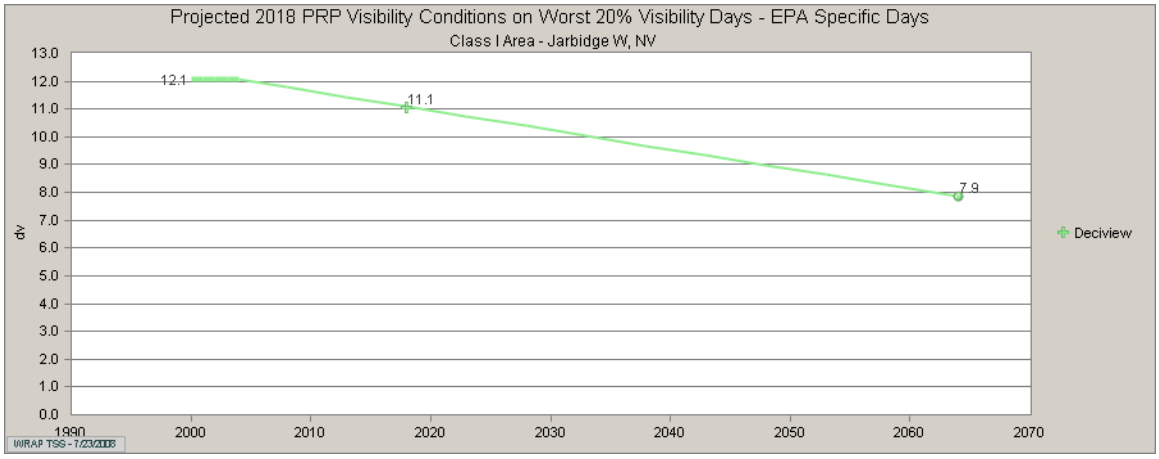
7.4 MITIGATION OF CONSTRUCTION IMPACTS

Nevada manages the release of fugitive dust from construction related activities through the implementation of regulations set forth in the Nevada Administrative Code (NAC).

NAC 445B.22037 requires fugitive dust to be controlled (regardless of the size or amount of acreage disturbed), and requires an ongoing program, using best practical methods, to prevent particulate matter from becoming airborne. All activities which have the potential to adversely affect the local air quality must implement all appropriate measures to limit controllable emissions. Appropriate measures for dust control may consist of a phased approach to acreage disturbance rather than disturbing the entire area all at once; using wet suppression through such application methods as water trucks or water sprays systems to control wind blown dust; the application of soil binding agents or chemical surfactant to roadways and areas of disturbed soil; as well as the use of wind-break or wind-limiting fencing designed to limit wind erosion of soils.

FIGURE 7-2

CMAQ 2018 WORST DAYS MODEL PROJECTIONS FOR JARB1
USING PRP18a EMISSIONS INVENTORY



Furthermore, no person may disturb or cover 5 acres or more of land or its topsoil until he has obtained an operating permit for surface area disturbance to clear, excavate or level the land or to deposit any foreign material to fill or cover the land. In addition to requiring a permit for all disturbances greater than 5 acres, a dust control plan must be submitted for all disturbances greater than 20 acres. The approval of the dust control plan does not limit the permit holder's need to control fugitive dust from the disturbance and its related activities, nor from putting into effect an ongoing program for using the best practical methods of dust control.

In addition to the requirements detailed above, there are guidelines for the Pahrump Valley (HA 162) in southern Nevada. In this area, a dust control plan is required for any disturbance greater than 5 acres. Washoe and Clark counties have their own respective air quality departments and, therefore, are responsible for managing their particular fugitive dust programs (see Chapter Six, section 6.5.2.3).

It is important to note the requirements above do not apply to agricultural activities occurring on agricultural land and mining exploration projects pursuant to Nevada Revised Statute 519A.180.

7.5 EMISSIONS LIMITATIONS AND SCHEDULES OF COMPLIANCE

BART emissions limitations and schedule for compliance is addressed directly by a revision to the Nevada Administrative Code (NAC) adopted on February 11, 2009[1] (Appendix A). The regulation identifies the emission limits and control technologies required as BART. For the NV Energy facilities it identified January 1, 2015 or five years after approval of Nevada's SIP, which

[1] In response to public comments on the draft RH SIP (contained in Appendix D), Nevada is revising the BART requirements at NV Energy's Reid-Gardner Generating Station. A regulatory amendment lowering the SO_2 emission limits for units 1, 2 and 3 from 0.25 to 0.15 lb/10^6 Btu, 24-hour average, has been submitted to the State Environmental Commission for presentation at their December 9, 2009 Hearing. See Appendix A.

ever occurs first, as the schedule for installation and operation of BART; for the Mohave facility, BART must be installed and operating at the time each unit resumes operation.[2]

The CAA programs described in Chapter Six and below have specific emissions limitations and schedules of compliance unique to each program. These limitations and schedules are identified in the specific rules.

7.6 SOURCE RETIREMENT AND REPLACEMENT SCHEDULES

The construction of new sources, which will ensure the early or scheduled retirement of older, less well-controlled sources, can greatly aid progress toward the national visibility goal over the long term. Nevada's continued implementation of NSR and PSD requirements with FLM involvement for Class I area impact review will protect the least impaired days from further degradation and will assure that no Class I areas experience degradation from expansion or growth of a single new source or large scale regional development of stationary sources.

7.7 SMOKE MANAGEMENT PROGRAM

Anthropogenic fire emissions for 2002 were estimated to be approximately 250 tons per year out of nearly 64,000 tons per year of total fire emissions in Nevada or less than 0.5 percent of the total fire emissions in Nevada. Further control of anthropogenic fire emissions within the state maybe of little benefit in improving visibility at Nevada and other Class I areas.

In Nevada, preventing and managing emissions from smoke are achieved through implementation of two separate elements of the air quality program. Open burning is controlled through a comprehensive set of open burning regulations. Prescribed fires used specifically for land management purposes are controlled through implementation of the Nevada Smoke Management Program.

Open burning regulations are found in NAC 445B.22067. The regulations apply to federal, state and private lands equally and prohibit open burning of combustible refuse, waste, garbage, oil or open burning for any salvage operation. Exemptions are granted for open burning conducted for the purposes of weed abatement, conservation, disease control, game or forest management and fire training. Burning for agricultural purposes is exempt, as is the burning of yard waste and untreated wood at single-family residences. Small fires used for cooking, recreation, education or ceremonial purposes are also exempt.

The Nevada Smoke Management Program was developed to coordinate and facilitate the statewide management of prescribed outdoor burning. This program is designed to meet the requirements of Nevada's air quality statutes listed in Nevada Revised Statutes (NRS) 445B.100 through 445B.845, inclusive, and the requirements of the USEPA Interim Air Quality Policy on Wildland and Prescribed Fires (EPA OAQPS, April 23, 1998). It supports the visibility

[2] On June 10, 2009, the owners of the Mohave Generating Station, including Southern California Edison (SCE), announced the decision to decommission the station and remove the generating facility from the site. The SCE news release states that in 2010, the plant's generating equipment will be removed and its operating permits terminated (http://www.edison.com/pressroom/pr.asp?bu=sce&year=2009&id=7234).

protection goals for Federal class I areas in Section 169A of the CAA. The program does not, however, supersede the authority of local governments to regulate and control smoke and air pollution under NRS 244.361 and NRS 268.410 or the authority of the state forester to regulate controlled fires under NRS 527.122 through 527.128.

The Nevada Smoke Management Program is administered by NDEP and compliance is achieved through a Memorandum of Understanding (MOU) between the various state and federal agencies that conduct prescribed burning, including the U.S. Bureau of Land Management, the U.S. Forest Service, the U.S. National Park Service, the U.S. Fish and Wildlife Service and Nevada state agencies. The MOU lists the objectives as well as both the mutual and individual responsibilities of the signatory parties. The MOU has a term of five years and will be renewed in 2011. Land managers recognize the importance of the Nevada Smoke Management Program and provide fiscal support for its continuation through various financial assistance agreements.

The *Smoke Management Plan* (http://ndep.nv.gov/baqp/technical/SMP2005.html) is a collaborative document, written by the signers of the MOU, and is the guiding document of the program. It details the applicability of the program and responsibilities of affected parties. It provides information on open burn variance requirements for those land managers using prescribed fire and wildland fires for land management purposes. It also includes information on air quality monitoring at prescribed fires, burner qualifications and emission reduction methods.

The *Smoke Management Plan* applies to all areas of Nevada except Clark County, Washoe County and Bureau of Indian Affairs trust lands. Applications for open burn variances are processed by NDEP. Applicants must estimate the prescribed fire's PM_{10} emissions. For larger fires, additional information is needed and stricter requirements are imposed. For fires emitting greater than 1 ton but less than 10 tons PM_{10} and located greater than 15 miles from a Class I area, a smoke sensitive area or a nonattainment area, the application must include an estimate of emissions from a model predicting the impact of smoke on smoke sensitive receptors. For prescribed fire projects emitting greater than 25 tons, or more than 10 tons if the burn area is within 15 miles of a Class I area, a smoke sensitive area or a nonattainment area, the application must also include a smoke management plan that lists smoke minimization methods to be used and the model or calculations used to make emission estimates. The plan must have a list of safety and contingency measures, identification of smoke sensitive areas that may potentially be affected, a list of air regulators to be notified and air monitoring to be conducted.

Variance conditions intended to mitigate smoke impacts apply to open burn variances issued by NDEP. These include: variances will be invalid during declared air pollution emergencies and alerts in affected areas; pre-ignition notification and approval is required; best smoke management and emission reduction techniques shall be practiced; and variances are issued with provisions related to supervision, inspection and availability of the variance. Additional restrictions and requirements apply where wildland fires are used to achieve land management objectives including a burn plan, applicable maps, a list of conditions under which burning will be suppressed and a stipulation requiring daily fire evaluation. Burn managers are expected to assess meteorological conditions, obtain a burn day forecast and not proceed to ignition unless conditions are favorable. All personnel conducting prescribed burns must meet burner qualifications.

Agencies conducting prescribed fires in excess of 10 tons of PM_{10} annually are required to supply NDEP with an annual fire activity report. This report provides a summary of fire activities including a listing of: permit number, acreage burned, fuel type, emissions estimates and emission factors used. NDEP is in the process of assessing current fire emission data collection procedures and future data needs. Consideration is being given to augmenting data collection efforts and emission tracking methods for the purposes of enhancing regional haze assessments. This may include participation in the WRAP's Fire Emission Tracking System or use of other fire emission tracking tools.

NDEP's website includes additional information on the Nevada Smoke Management Program and can be found at http://ndep.nv.gov/baqp/technical/smoke.html. Permit applications, an instruction sheet, links to applicable statutes and regulations and contact information are provided.

7.8 ENFORCEABILITY OF EMISSIONS LIMITS

Enforceability of the BART emission limits will be through rule. Amendments to the NAC were approved by the State Environmental Commission during their February 11, 2009 hearing.[3] Where CAA programs specify emissions limits, these limits are enforceable through federal rule. Some state and local pollution control programs do not have enforceable emissions limits but are still effective in reducing emissions of visibility impairing pollutants.

7.9 LONG-TERM STRATEGY

Projected 2018 visibility conditions at the Jarbidge WA are better than the glidepath toward achieving natural visibility conditions by 2064. For this reason and other factors discussed in Chapter Six (see section 6.7) and below, Nevada's long-term strategy will be limited to those pollution control programs described in Chapter Six and below (i.e., the "on-the-books" and "on-the-books" controls included in the PRP18a emission inventory in Chapters Three and Six and the reductions realized from the implementation of BART) that result in the RPG identified in Chapter Six.

For the same reasons, Nevada did not take into consideration the costs of compliance; the time necessary for compliance; the energy and non-air quality environmental impacts of compliance; and the remaining useful life of any non-BART sources in establishing our RPGs for this planning period. Therefore, this SIP does not include a demonstration showing how these factors were taken into consideration in selecting the goals.

[3] In response to public comments on the draft RH SIP (contained in Appendix D), Nevada is revising the BART requirements at NV Energy's Reid-Gardner Generating Station. A regulatory amendment lowering the SO_2 emission limits for units 1, 2 and 3 from 0.25 to 0.15 lb/10^6 Btu, 24-hour average, has been submitted to the State Environmental Commission for presentation at their December 9, 2009 Hearing. See Appendix A.

7.9.1 Anthropogenic Sources of Visibility Impairment

Table 7-2 identifies the relative contribution of each visibility impairing pollutant from anthropogenic and natural emission sources. These data suggest SO_2 and NO_x are the dominant anthropogenic emissions of primary particulate matter from Nevada sources. Natural sources include emissions from the biogenic, natural fire and windblown dust source categories. *Emissions from natural sources represent nearly three-quarters of all emissions originating from within Nevada's borders.* Natural sources are uncontrollable and have little potential for effective control of visibility impairing emissions.

Table 7-3 identifies the relative contribution to visibility impairment by pollutant for the baseline and 2018 and the change in emissions from the baseline period to 2018. Table 7-4 identifies the largest source categories for each pollutant and the change in emissions from the baseline to 2018 by source category. The 2018 emission inventory does not include all emissions reductions related to the full implementation of BART in Nevada or other WRAP states, so additional emissions reductions beyond those shown are likely by 2018. The pollutants are ordered by their relative contribution to the baseline worst days visibility impairment.

TABLE 7-2

SUMMARY OF NEVADA ANTHROPOGENIC AND NATURAL EMISSIONS

Pollutant	2002		2018	
	Anthropogenic Sources	Natural Sources	Anthropogenic Sources	Natural Sources
SO_2	96%	4%	94%	6%
NO_x	86%	14%	83%	17%
EC	27%	73%	17%	83%
PMF	44%	56%	51%	49%
PMC	38%	62%	47%	53%
NH_3	86%	14%	88%	12%
POA (OC)	9%	91%	9%	91%
VOC	10%	90%	10%	90%
Total Emissions	28%	72%	27%	73%

TABLE 7-3

NEVADA'S EXTINCTION CONTRIBUTION AND EMISSIONS BY SPECIES

	Annual Average Baseline Extinction Contribution		Emissions (tpy)		
	Worst Days	Best Days	2002	2018**	Change
*OMC	40.0%	26.3%	24,734	24,822	0.4%
CM	22.3%	9.2%	161,142	188,287	17%
SO_4	16.7%	40.9%	68,989	46,224	-33%
SOIL	9.7%	2.8%	20,969	24,134	15%
EC	6.5%	9.4%	6,409	5,638	-12%
NO_3	4.5%	9.8%	162,475	135,496	-17%

* POA for emissions

** 2018 emissions projection does not include BART reductions

Examination of Table 7-4 shows the largest source categories for four of the visibility impairing pollutants, organic matter carbon (OMC), coarse matter (CM), SOIL and elemental carbon (EC), are natural emissions resulting from natural fire and windblown dust. Point sources are the dominant emission category for ammonium sulfate (SO_4) and ammonium nitrate (NO_3), although area sources are also significant emitters of SO_x; and mobile sources, both on- and off-road, are important emitters of NO_x. Fugitive dust is an important source category for CM and SOIL emissions. The long-term strategy for the first planning period focuses on SO_x and NO_x emissions originating from point and mobile sources. These source categories are discussed below.

TABLE 7-4

NEVADA EMISSIONS SOURCE CONTRIBUTIONS BY SPECIES

	Largest 2018 Source Category	Percent of 2018 Inventory	2002 to 2018 Change for Category	Second Largest 2018 Source Category	Percent of 2018 Inventory	2002 to 2018 Change for Category
*OMC	**Natural Fire**	90.6%	0%	Area	3.1%	13%
CM	**Windblow Dust**	49.9%	0%	Fugitive Dust	36.5%	45%
SO4	Point	61.3%	-44%	Area	30.1%	10%
SOIL	**Windblow Dust**	43.3%	0%	Fugitive Dust	30.0%	44%
EC	**Natural Fire**	82.9%	0%	**Mobile	14.0%	-50%
NO3	Point	50.0%	13%	**Mobile	27.5%	-49.5%

* POA for emissions

** Includes on-road and off-road mobile sources

Bold text indicates natural sources

7.9.1.1 Major and Minor Stationary Sources

Nevada's evaluation of the monitoring, emissions and modeling data suggests that point source emissions of SO_x and NO_x are the most likely candidates for additional control, although these emissions are not the most significant contributors to visibility impairment at the Jarbidge WA. Baseline and 2018 emissions of SO_x and NO_x from within Nevada are dominated by anthropogenic sources, as shown on Table 7-4. Although OMC (formed from Primary organic aerosol (POA) and Volatile organic compound (VOC) emissions), EC, PMC and PMF are significant contributors to visibility impairment, their emissions are dominated by natural and uncontrollable sources. Nevada's SO_x emissions have a greater contribution to visibility impairment at JARB1 than NO_x (see Figures 2-7 and 2-11), although Nevada's NO_x emissions are two to three times greater than SO_x emissions.

As noted in Chapter Three and identified in Table 7-5, the 2018 emissions inventory lists 30 point sources with NO_x emissions greater than 100 tpy and 13 with SO_x emissions greater than 100 tpy. Point sources with emissions greater than 100 tpy represent 97 percent of Nevada's total 2018 point source inventories for SO_x and NO_x.

The 30 NO_x point sources include all four Nevada sources subject to full BART determinations, as well as three other facilities that are BART-eligible but do not cause or contribute to visibility impairment at any Class I area. Also included on the NO_x list are all five future EGUs proposed for Nevada, described in Chapter Three. The 13 SO_x sources include two facilities subject to a full BART analysis, as well as two other facilities that are BART-eligible but do not cause or contribute to visibility impairment at any Class I area. Also included on the SO_x list are three proposed coal-fired EGUs.

TABLE 7-5

SUMMARY OF SO_2 AND NO_X EMISSIONS FROM
NEVADA POINT SOURCES FOR 2018

Annual Emissions (tpy)	SO_2		NO_x	
	Number of Facilities	**Cumulative Percent of Total Point Source Emissions**	**Number of Facilities**	**Cumulative Percent of Total Point Source Emissions**
> 10,000	0	0%	1	29.0%
2,000 to 10,000	3	78.7%	6	76.3%
500 to 2000	3	92.5%	8	90.8%
100 to 500	7	97.7%	15	97.0%

A discussion of the BART process in Nevada can be found in Chapter Five where links to reports documenting the BART analyses are provided. Exemption modeling for one of the BART-eligible facilities, Chemical Lime Company located in Clark County, demonstrated that the maximum visibility impact of 0.245 delta dv occurred at the Grand Canyon approximately 90 miles away, roughly half of the cause or contribute threshold of 0.5 dv. The other BART-eligible facility, Nevada Cement Company, holds a permit to reconstruct a state-of-the-art facility resulting in an overall reduction of emissions.

Nevada Cement Company applied for and received a construction permit to construct a new, state-of-the-art cement production plant. They netted out of PSD review by shutting down and removing their current kilns and other ancillary production-related processes to make room for the new kiln. The new plant is subject to the National Emission Standards for Hazardous Air Pollutants program and will reduce overall emissions, while increasing production capacity. The net permitted (potential to emit) emission decreases for NO_x, SO_2 and PM_{10} are 1,812, 186.59 and 167.29 tons per year, respectively. Actual 2018 emissions reductions at Nevada Cement will be slightly less.

The effects of Nevada's Renewable Portfolio Standard (RPS) on EGU source retirement and replacement schedules are not well known. The portfolio standard requires each electric service provider to generate, acquire or save electricity from portfolio energy systems or efficiency measures in an amount that is not less than 20 percent of the total amount of electricity sold by the provider by 2015. Current 2018 emissions projections include five proposed EGUs for Nevada, as discussed in Chapter Three and shown on Table 3-5. The demand for one or more of these proposed EGUs may be met by renewable energy sources, negating the emissions associated with a projected EGU and therefore reducing 2018 emissions. However, it is impossible to predict at this time which or how many of these proposed EGUs will be constructed.

Many of Nevada's point sources with SO_2 or NO_x emissions greater than 100 tpy are well controlled or will be well controlled through the BART process. In addition, several of the federal pollution control programs described in Chapter Six (see section 6.5.2) address emission

from point sources (i.e., Maximum Achievable Control Technology standards). The SO_2 point source inventory for 2018 represents a nearly 60 percent reduction from the baseline inventory, and the 2018 NO_x point source inventory represents a greater than 30 percent reduction from the baseline when proposed BART controls are included. These significant reductions demonstrate reasonable progress from point sources in Nevada.

7.9.1.2 Mobile Sources

Nevada has achieved significant reductions in SO_x and NO_x emissions from mobile sources through the implementation of federal, state and local emissions control programs. Implementation of the federal programs will result in a 49 percent reduction in mobile source NO_x emissions and a 63 percent reduction in mobile source SO_x emissions from the baseline to 2018 (PRP18a). These significant reductions demonstrate reasonable progress from mobile sources, both on-road and off-road, in Nevada.

Table 3-15 shows mobile sources are significant source categories for NO_x and ammonia (NH_3). On-road and off-road mobile sources contribute approximately 25 percent of the total statewide 2018 NO_x emissions inventory and 23 percent of the NH_3 inventory. Many of the federal pollution control programs identified in Chapter Six (see 6.5.2.1) focus on reducing NO_x emissions from mobile sources, both on-road and off-road. In addition, Washoe and Clark Counties have implemented mobile source emissions reduction programs to address non-attainment areas, as discussed in Chapter Six (see 6.5.2.3) and this chapter (see 7.9.2.1). The emissions reductions related to the implementation of these local programs has not been factored into the PRP18a emissions projections or modeling.

7.9.1.3 Area Sources

Area sources are by nature, relatively small emissions sources with diverse characteristics which make effective control difficult. Nevada has not evaluated or addressed emissions reductions from area sources in this, the first planning period of the sixty-year regional haze SIP process.

7.9.1.4 International Emissions

Emissions from outside the modeling domain, as well as those from Canada and Mexico contribute substantially to visibility impairment at the Jarbidge WA and other Class I areas across the WRAP. These emissions are beyond the control by federal, state or local regulatory agencies in the United States. At the Jarbidge WA, international emissions of SO_x and NO_x contribute 51 percent and 30 percent of the 2018 SO_4 and NO_3 visibility impairment at JARB1, respectively.

Emissions from Pacific Offshore sources, as discussed in Chapter Four (see 4.3), although not strictly international, include emissions from international waters of the Pacific Ocean. Emissions of SO_x and NO_x from Pacific Offshore sources contribute 6.9 percent of SO_4 visibility impairment and 1.3 percent of NO_3 visibility impairment at JARB1.

7.9.2 Additional Emissions Control Programs

Nevada has numerous existing emission control programs to improve and protect visibility in Class I areas. Generally, Nevada considers its NSR and PSD programs meet the long-term strategy requirements for preventing future visibility impairment from proposed major stationary sources or major modifications to existing facilities. In addition to Nevada's permitting program, Nevada also has emission control requirements for motor vehicles in Clark and Washoe Counties and residential burning in Washoe Country, as well as PM_{10} nonattainment/maintenance area requirements, dust suppression for construction areas and unpaved roads, and renewable energy requirements.

The state believes that its existing regulations along with the activities outlined below together provide for reasonable progress toward the national visibility goal. Nevada's continued implementation of NSR requirements with FLM involvement for Class I area impact review will protect the least impaired days from further degradation and will assure that no Class I areas with a potential to be impacted by Nevada emissions will experience degradation from expansion or growth of a single new source.

7.9.2.1 State and Local Mobile Source Programs

Nevada's two major metropolitan areas, Clark County (Las Vegas) and Washoe County (Reno), have inspection and maintenance programs per the Clean Air Act requirements for areas that were not attaining the national ambient air quality standards for carbon monoxide (CO). Washoe County has a basic program while Clark County has a low enhanced program. Both reduce CO and VOC emissions from motor vehicles.

Both Washoe and Clark Counties have Stage I and Stage II gasoline vapor recovery regulations. These systems control VOC vapor releases during the refilling of underground gasoline storage tanks and the refueling of motor vehicles. The Stage II system controls the release of VOC, benzene and toxics emitted from gasoline. Both counties have wintertime oxygenated fuel programs that reduce CO emissions.

Nevada statute requires an additional statewide program to reduce emissions of pollutants from motor vehicles, the Alternative Fueled Vehicle program. The Alternative Fueled Vehicle program requires state and local government fleets to operate 90 percent of their fleet vehicles on alternative fuel. This program reduces NO_x, SO_2, CO, VOCs and PM. Nevada also has a statewide regulation prohibiting the emission of smoke from any gasoline powered motor vehicle.

Washoe and Clark Counties were designated nonattainment for CO in 1978, along with the Lake Tahoe Basin. The Nevada portion of the Tahoe Basin and Washoe County have each been redesignated as attainment. Clark County has submitted a CO redesignation request to USEPA.

7.9.2.2 Nevada's Renewable Portfolio Standard

With large-scale geothermal development in Nevada dating back to the mid-1980's and use of hydroelectric energy since the early part of the last century, Nevada's electric utilities have pioneered the use of renewable energy. In cooperation with the utilities, Nevada was one of the first to adopt a RPS in 1997, which is now among the most aggressive in the United States. Nevada's RPS has set the bar high in terms of its percent of renewable energy, timetable and solar quota, requiring that not less than 20 percent of the total electricity sold in 2015 and thereafter be renewable. Power producers have responded by working with renewable energy companies to bring many new renewable projects into operation. As a result, Nevada now leads the nation in both geothermal and solar power per capita.

In 2007, two of the world's largest solar projects began operation in southern Nevada, the 64 MW Nevada Solar One concentrating solar power plant and the 14 MW Solar Star photovoltaic facility at Nellis AFB. Geothermal energy is a renewable resource particularly abundant in Nevada. With three new geothermal plants completed in the past year, and a total of 26 projects under contract, Nevada's main utility, NV Energy, is on-the-books to doubling the geothermal portion of its renewable energy portfolio by 2012 to a total of nearly 500 MW. These efforts to meet the RPS will replace some of the need for fossil fuel fired EGUs in Nevada.

7.9.2.3 Marine Diesel Engine Rule

As part of its National Clean Diesel Campaign, USEPA promulgated a rule to reduce diesel emissions from marine engines less than 30 liters per cylinder effective July 7, 2008. These engines are used to power a wide variety of vessels, from small fishing and recreational boats to large tugs and Great Lakes freighters. They are also used to generate auxiliary vessel power, including on ocean-going ships. The new standards will dramatically reduce PM and NO_x emissions by: tightening emissions standards for remanufactured engines; setting near-term engine-out emissions standards (Tier 3) for newly-built marine diesel engines; and setting longer-term standards (Tier 4) that reflect the application of high-efficiency after-treatment technology.

USEPA estimates 90 percent PM reductions and 80 percent NO_x reductions from Tier 4 engines meeting these standards, compared to engines meeting the current Tier 2 standards. By 2030 this program will reduce annual nationwide emissions of NO_x by about 800,000 tons and PM emissions by 27,000 tons, and those emission reductions continue to grow beyond 2030 as fleet turnover is completed. Additional information regarding this program can be found at http://www.epa.gov/otaq/regs/nonroad/420f08004.htm.

7.9.3 Other Considerations

WRAP technical analyses of causes of haze in the west show significant impacts from non-anthropogenic and otherwise non-controllable source sectors, such as fire, dust and sources outside state jurisdiction. Emissions of NO_x and SO_2 from point, mobile and area sources are the predominant anthropogenic pollutants to be addressed through regional haze SIPs in the West.

The largest category of stationary source SO_2 and NO_x emissions is electric generating units, a source category from which substantial reductions have already occurred.

There are significant control programs in place in Nevada and the WRAP region to reduce SO_2 and NO_x emissions between the baseline period and 2018. Most notable of these programs is the implementation of BART requirements, which are anticipated to result in significant reductions of SO_2 and NO_x emissions in the WRAP region. These reductions are in addition to significant emission reductions of SO_2 and NO_x from 2002 to 2006 from EGUs (BART and non-BART sources) in the west, on the order of 30 percent for SO_2 and 10 percent for NO_x.

However, the full impact of these significant emissions reductions has not yet been fully evaluated by Nevada. Therefore, for the 2013 interim review, Nevada will determine refined reasonable progress at the Jarbidge WA in consideration of:

- Evolving modeling and technical analyses;
- Evolving progress on BART and reasonable progress from contributing states; and
- Limited control Nevada has with respect to natural, interstate and international emissions that contribute to visibility impairment at the Jarbidge WA.

WRAP will conduct additional modeling with updated 2018 emissions inventories that reflect additional control measures identified by states. The updated inventories will incorporate the results of Nevada and other WRAP states' BART determinations, as well as other reasonable measures states identify for implementation in the initial review period. Additional reductions to the WRAP-wide, as well as statewide emissions are expected as states move through development of their regional haze programs. These modeling efforts will be scheduled by RMC upon completion of BART determinations by all WRAP states, anticipated in 2009 to 2010.

A complete assessment of Nevada's RPG cannot be made until the effects on visibility impairment resulting from emissions reductions due to full implementation of BART and other RH SIP control programs are determined. However, 2018 reasonable progress measured at the Jarbidge WA is expected to be better than shown by the current modeling projections, which are based on the PRP18a emissions inventory. Nevada will continue to work with the WRAP's ongoing modeling program to refine the RPG for the Jarbidge WA as these data become available. Nevada does not anticipate revision of the RPG based on the updated modeling. The modeling results will, however, provide Nevada with additional tools to evaluate and refine its long-term strategy as part of the mid-course regional haze SIP review.

Under the proposed long-term strategy described herein, there may be some additional visibility improvements that occur by 2018 beyond those reflected in the RPGs identified in Chapter Six. Emissions reductions due to the implementation of some state and local pollution control programs have not been or can not be quantified and have not been included or will not be included in the emissions inventories used for visibility and source apportionment modeling. The following section describes additional control programs in Nevada, the benefits of which have not been included in Nevada's RPG identified in Chapter Six.

7.9.3.1 Uncertainty

Nevada's reasonable progress demonstration and development of a long-term strategy have identified numerous factors affecting the implementation of our long-term strategy and resulting reasonable progress. These factors have important but unknown impacts to all elements of the plan to reduce or contain emissions contributing to regional haze. The most significant factor is the uncertainty of the projected 2018 emission inventories, which may not reflect actual 2018 emissions for Nevada sources. Some of the factors affecting Nevada's reasonable progress are related to projected emissions inventories and the uncertainties associated with growth projections and the implications of future regulatory actions.

Nevada has seen significant reductions in economic and population growth in the last two years, which may compromise the earlier growth projections. The observed slowdown in population growth may reduce actual area and mobile source emissions from projected 2018 values. The current economic slowdown in Nevada has severely curtailed residential and commercial real estate construction, a significant component of off-road mobile source emissions. Likewise, the high fuel costs of 2008 have resulted in lower fuel demand and therefore less on-road mobile source emissions. Current economic forecasts only highlight the uncertainties of projecting emissions based on growth estimates, with some experts predicting several years of slow economic growth.

Nevada acknowledges the many difficulties associated with the projection of area and mobile source emissions, but remains confident the inventories represent the best available data at the time they were developed. However, Nevada also acknowledges there is associated uncertainty with the area source projections, which may over-predict future emissions in light of the current economic times.

Repair and replacement schedules for large point sources of NO_x and SO_2 are difficult for the regulatory community to anticipate. It is also difficult to predict the potential permit revisions for other large sources in response to growth of any particular industry sector. Repair and replacement of current facilities will continue to drive permit revisions at their own pace, but will likely reduce emissions as new technology is incorporated into the facilities.

Another level of uncertainty in the growth projections relates to regulatory uncertainty. The consequences of future regulatory actions are not well known at this time. The Clean Air Mercury Rule was recently vacated by the courts. Whether USEPA will reissue this regulation or what form it will take is not known at this time. The other area of regulatory uncertainty is how USEPA will regulate green house gas emissions and what ancillary benefits to visibility will be realized.

$PM_{2.5}$ and ozone nonattainment SIPs are due 2012 and 2013. Most Nevada sources will not be affected by nonattainment SIPs; however sources in Washoe or Clark Counties maybe subject to nonattainment SIPs. Certainly there will be localized reductions in $PM_{2.5}$ and ozone as SIPs are implemented in nonattainment areas, not only in Nevada, but across the west. Additional control measures resulting from nonattainment SIPs and other regulatory actions will result in direct

reductions of visibility impairing pollutants. The co-benefits of implementing additional controls for $PM_{2.5}$ and ozone will also reduce emissions of visibility impairing pollutants.

7.9.3.2 Contributions to Impairment at Class I Areas Outside of Nevada

Tables 4-3 and 4-4 identify Nevada's contribution to visibility impairment at Class I areas in the five states adjacent to Nevada based on the Particulate Matter Source Attribution Tracking modeling discussed in Chapter Four. In order to evaluate whether Nevada's SIP includes all measures necessary to obtain its share of the emission reductions needed to meet the progress goals for those Class I areas, NDEP calculated:

- The visibility reductions needed at these Class I areas to achieve the 2018 URP goal;
- The percentage of the needed reduction achieved based on the Base02d emission inventory and modeling scenario;
- Nevada's emissions reduction share;
- The contribution of Nevada emissions to SO_4 and NO_3 extinction;
- The percentage change in Nevada's emissions from Plan02d to PRP18a; and
- The percentage change in Nevada's weighted emissions potential (WEP) from Plan02d to PRP18a.

This information is presented in Table 7-6 for the Class I area in each adjacent state with the highest modeled SO_4 and NO_3 contribution to visibility impairment for the 2018 worst days (see Tables 4-3 and 4-4). NDEP has included the Hoover Wilderness Area at the request of the FLMs.

Examination of Table 7-6 shows that the percentage of Nevada's emissions reductions or weighted emissions reductions exceed the percentage of Nevada's contribution to visibility impairment at all Class I areas listed. Some of the numbers listed in the WEP change column are negative, reflecting an increase in Nevada's WEP. These increases are an artifact of the WEP methodology, where all the percentages of emission contribution are normalized to the largest valued grid cell. This is especially evident for SO_4 at Hells Canyon Wilderness Area in Oregon, where Nevada's WEP contribution increased by nearly 30 percent. This is due to the significant SO_x emissions reductions achieved by sources closer to Hells Canyon Wilderness Area (i.e. sources in Idaho, Oregon and Washington) and the inverse distance function of the WEP. Chapter One (section 1.3.3.2 Source Apportionment Modeling) describes the WEP methodology and the limitations regarding the use of these data.

In order to more fully understand the significance of the WEP data presented in Table 7-6, the upper portion of Figure 7-3 shows the significant contributions and 2018 reductions for Idaho, Oregon and Washington sources' potential contributions and the relatively small potential contribution for Nevada sources at Hells Canyon Wilderness Area. The lower portion of Figure 7-3 presents the SO_x weighted emission potential map for Hells Canyon Wilderness Area. Note that Nevada has only three grid cells with weighted emission potentials greater than one percent, one of which is LS Power's proposed 1500 MW coal-fired EGU in east central Nevada.

Figures 7-4, 7-5 and 7-6 show similar WEP analyses for the Sawtooth Wilderness Area, Desolation Wilderness Area, and Hoover Wilderness Area, respectively. Review of Chapter Three (section 3.8.1 Nevada SO_x Emission Inventory for 2002 and 2018, Table 3-7) shows that

area sources are the only Nevada source category with significant growth (1,243 tons or 10 percent) of SO_2 emissions. Figure 3-10 is a regional map of gridded SO_x emissions, while Figure 3-11 breaks down Nevada's SO_2 emissions by county.

These figures and Table 7-6 are all based on the PRP18a emission inventory, which does not incorporate the full implementation of BART in Nevada or across the WRAP region (see Chapter One 1.3.2 Emissions Analyses and Projections). Table 7-1 identifies the additional emissions reductions from the PRP18a inventory resulting from the full implementation of BART in Nevada.

TABLE 7-6

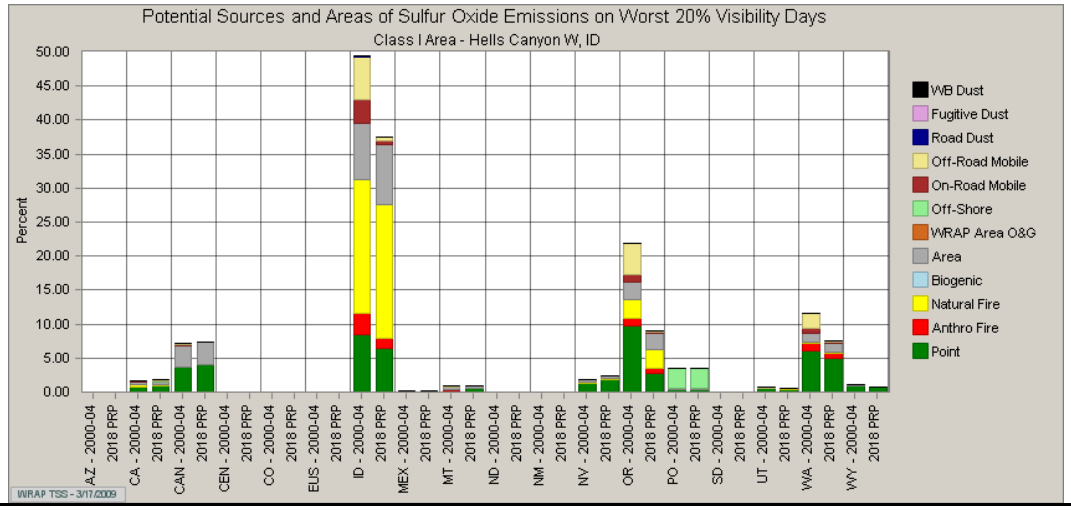
SUMMARY OF VISIBILITY IMPAIRMENT AT NEARBY CLASS I AREAS
AND NEVADA'S EMISSIONS REDUCTIONS

Monitor - Component	Baseline Extinction (dv or Mm^{-1})	2018 URP (dv or Mm^{-1})	Extinction Reduction Needed (percent)	2018 RPG (dv or Mm^{-1})	Reduction Acheived (percent)	2018 Pollutant Contribution by Nevada from PSAT (percent)	Nevada's Emissions Reduction Share (percent)	Reduction in Nevada Emissions Base02d to PRP18a (percent)	Reduction Nevada Weighted Emission Potential* (percent)
Arizona									
GRCA2 - Deciview	11.66	10.58	9.3%	11.10	4.8%				
GRCA2 - SO_4	5.36	4.11	23.3%	4.56	14.9%	2.8%	0.7%	33.0%	65.2%
SYCA1 - Deciview	15.25	13.25	13.1%	15.08	1.1%				
SYCA1 - NO_3	2.03	1.69	16.7%	1.67	17.7%	4.3%	0.7%	16.6%	22.5%
California									
BLIS1 - Deciview	12.63	11.10	12.1%	12.22	3.2%				
BLIS1 - SO_4	5.07	3.96	21.9%	4.90	3.4%	4.4%	1.0%	33.0%	-4.4%
BLIS1 - NO_3	2.38	2.01	15.5%	1.59	33.2%	20.0%	3.1%	16.6%	36.2%
HOOV1 - Deciview	12.87	11.66	9.4%	12.45	3.3%				
HOOV1 - SO_4	5.00	3.91	21.8%	4.61	7.8%	2.6%	0.6%	33.0%	-1.0%
HOOV1 - NO_3	1.63	1.43	12.3%	1.35	17.2%	8.3%	1.0%	16.6%	23.4%
Idaho									
SAWT1 - Deciview	13.78	12.06	12.5%	13.25	3.8%				
SAWT1 - SO_4	3.06	2.50	18.3%	2.62	14.4%	2.5%	0.5%	33.0%	-7.7%
SAWT1 - NO_3	0.63	0.65	-3.2%	0.55	12.7%	3.2%	-0.1%	16.6%	12.0%
Oregon									
HECA1 - Deciview	18.55	16.17	12.8%	16.60	10.5%				
HECA1 - SO_4	8.37	6.35	24.1%	7.41	11.5%	4.0%	1.0%	33.0%	-29.2%
HECA1 - NO_3	28.47	19.69	30.8%	20.56	27.8%	5.5%	1.7%	16.6%	13.8%
Utah									
ZION1 - Deciview	13.24	11.78	11.0%	12.76	3.6%				
ZION1 - SO_4	5.29	4.04	23.6%	4.48	15.3%	5.6%	1.3%	33.0%	43.8%
BRCA1 - Deciview	11.65	10.52	9.7%	11.22	3.7%				
BRCA1 - NO_3	2.52	2.06	18.3%	2.27	9.9%	8.8%	1.6%	16.6%	21.7%

* Anthropogenic source categories only.

FIGURE 7-3

WEIGHTED EMISSION POTENTIAL ANALYSIS FOR HELLS CANYON WILDERNESS AREA



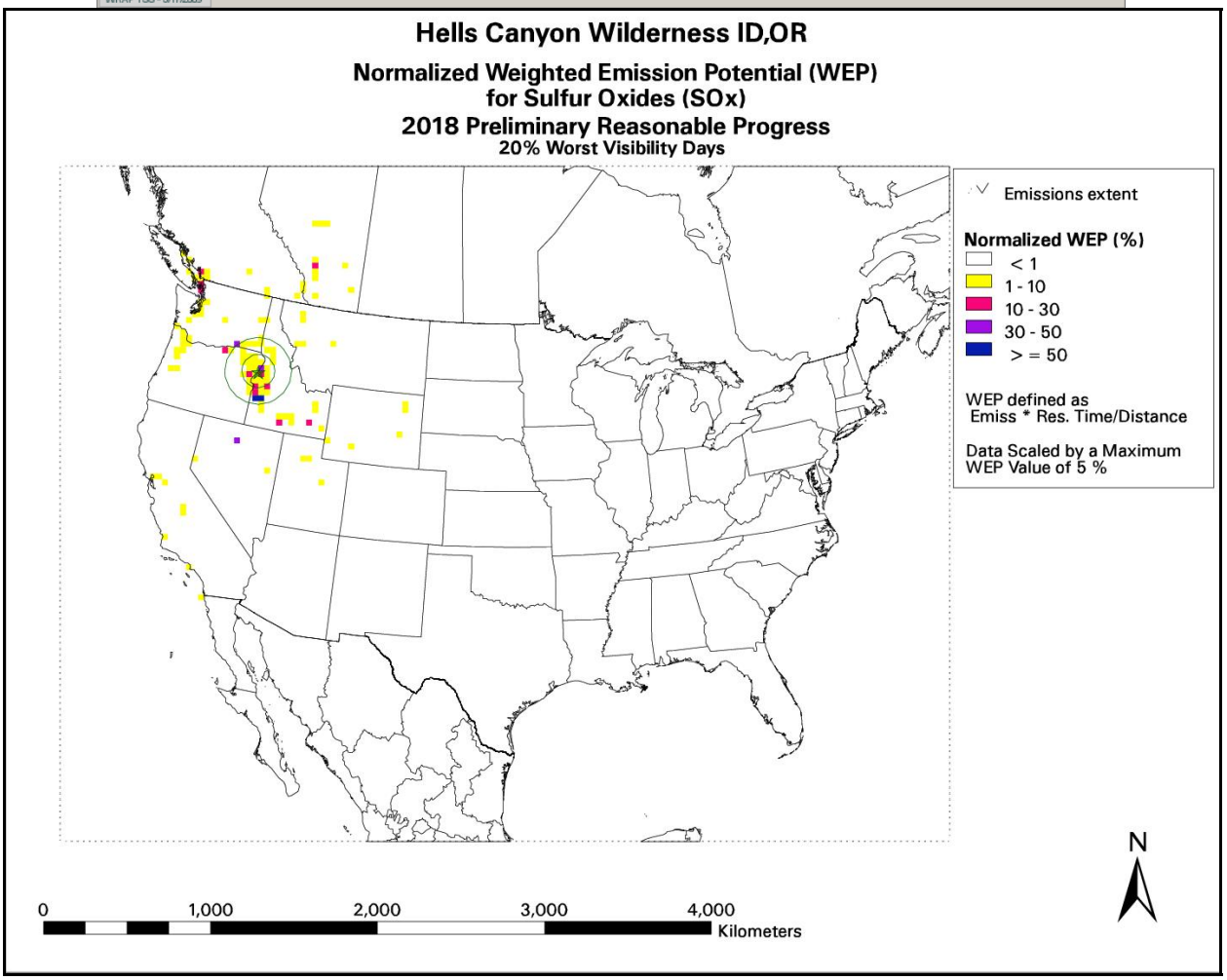
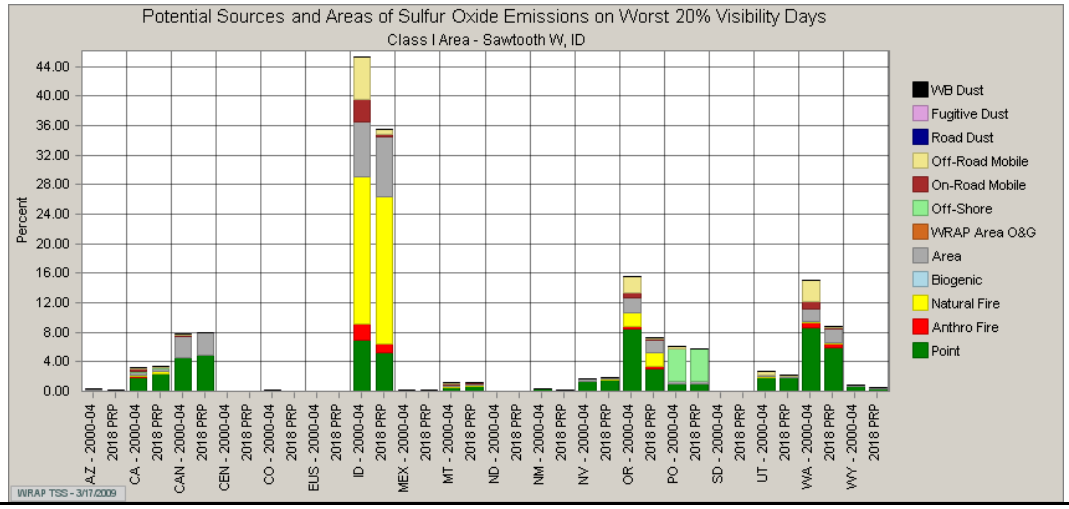


FIGURE 7-4

WEIGHTED EMISSION POTENTIAL ANALYSIS FOR SAWTOOTH WILDERNESS AREA



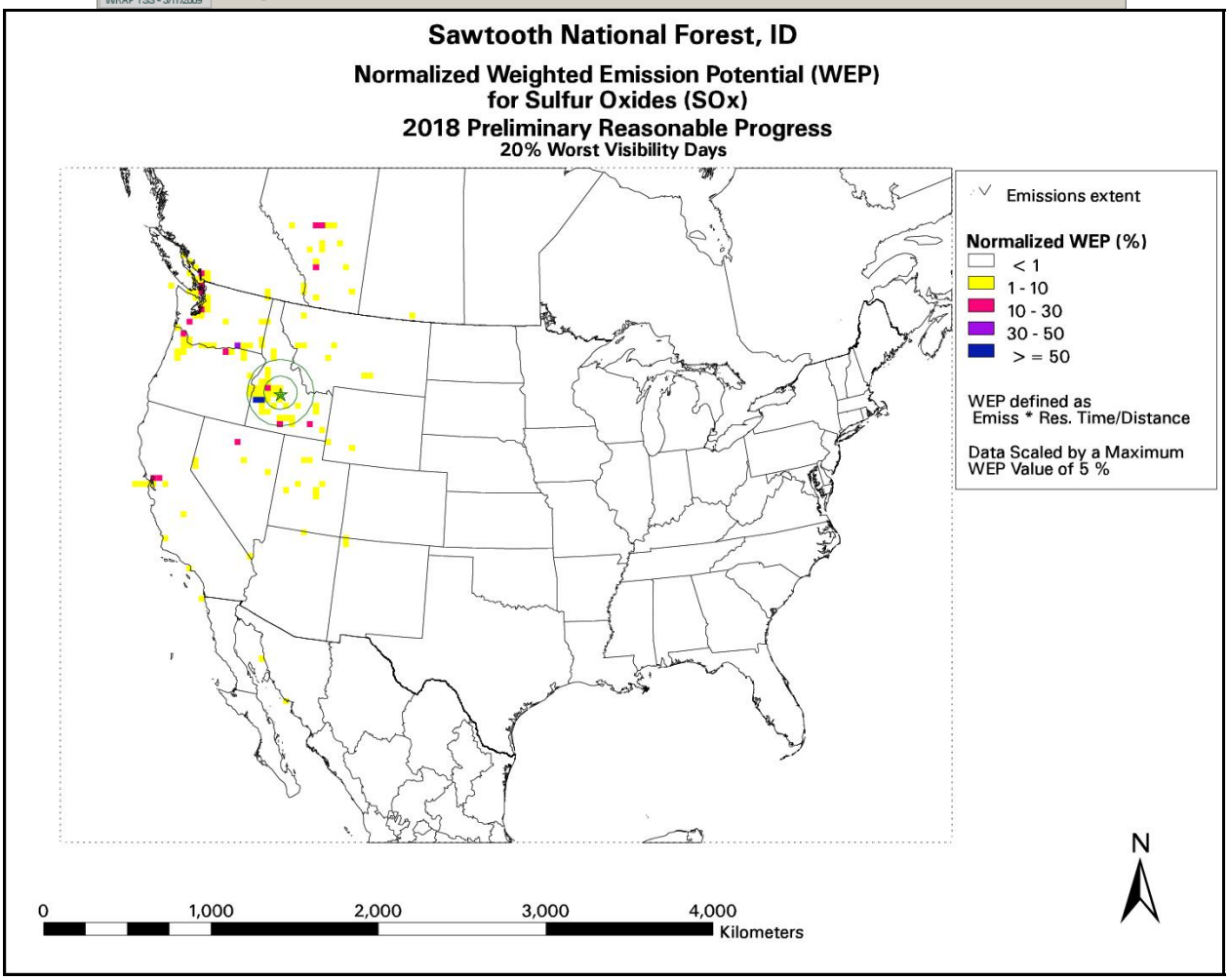
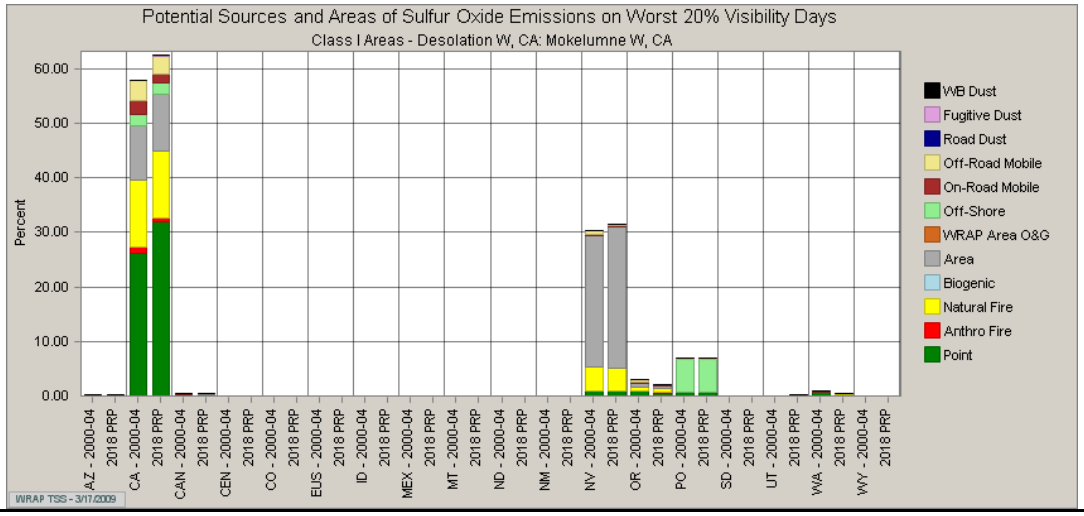


FIGURE 7-5

WEIGHTED EMISSION POTENTIAL ANALYSIS FOR DESOLATION WILDERNESS AREA



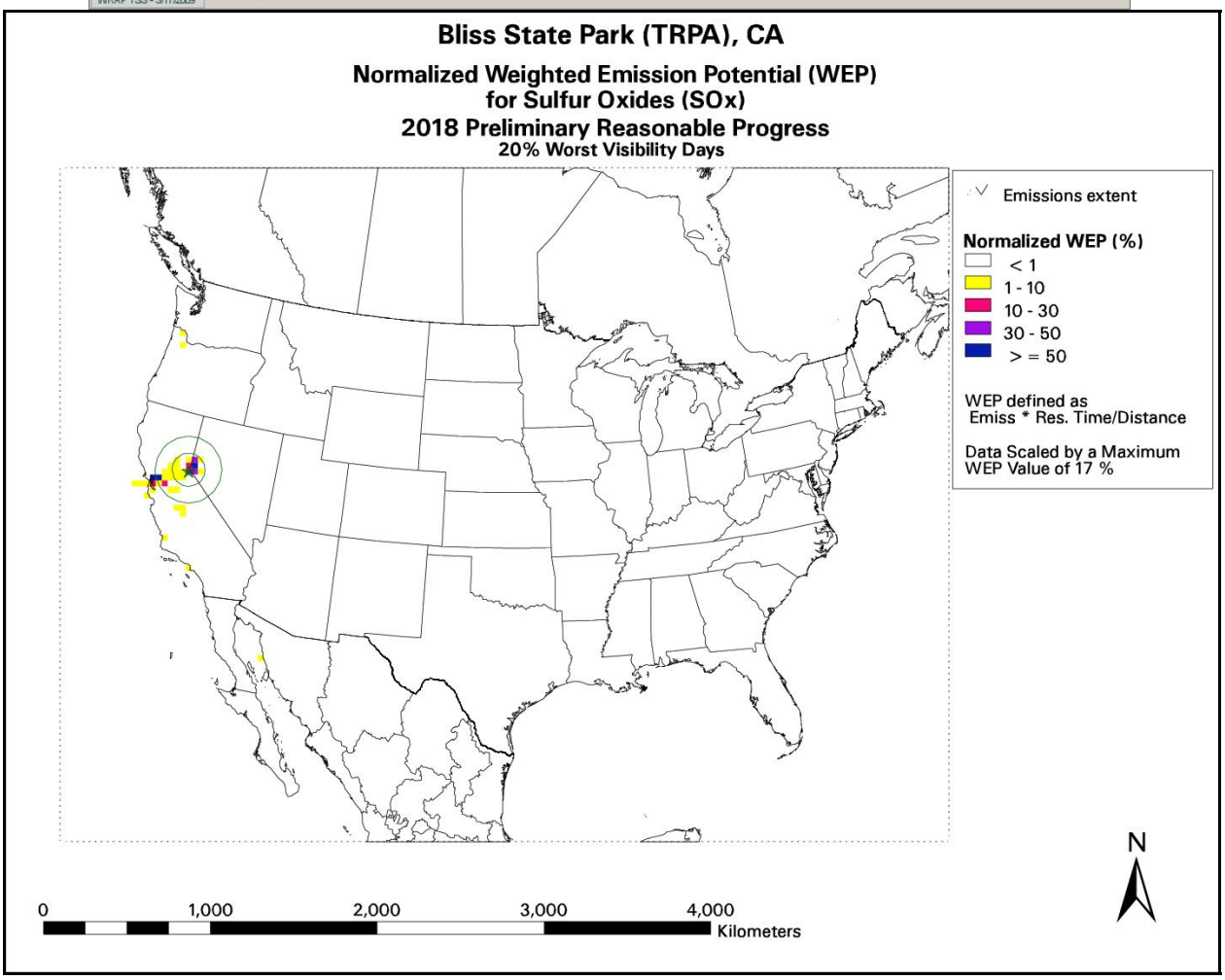
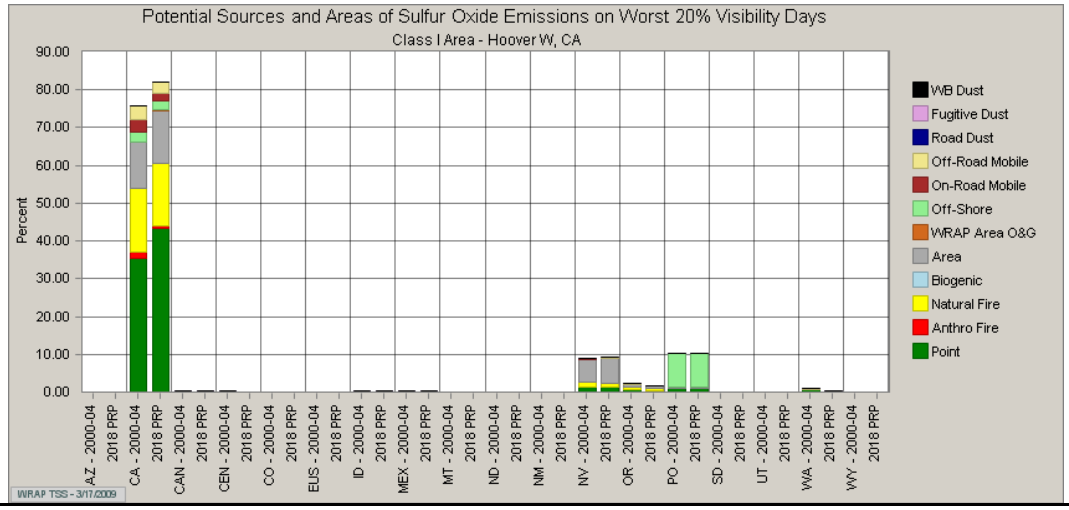
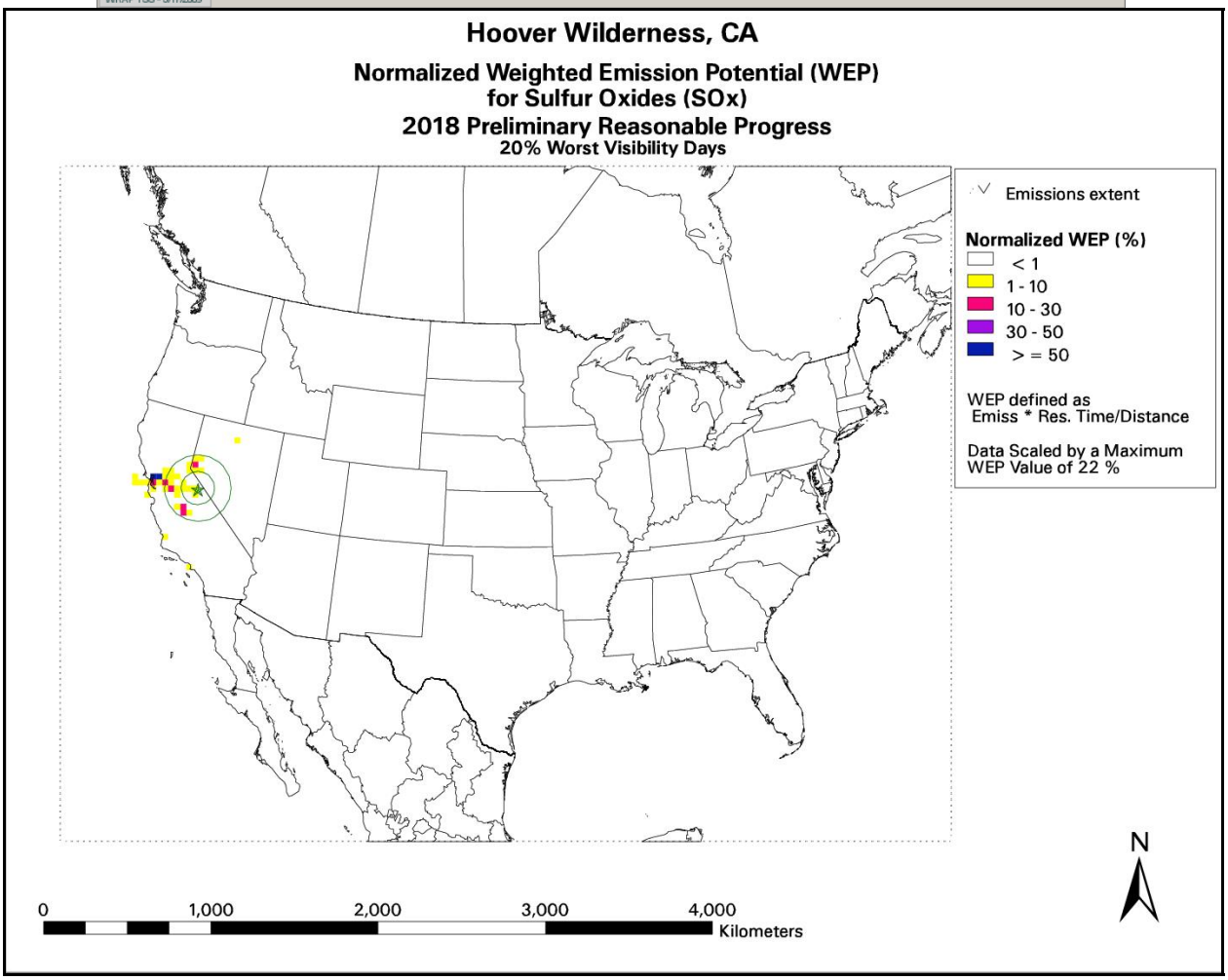


FIGURE 7-6

WEIGHTED EMISSION POTENTIAL ANALYSIS FOR HOOVER WILDERNESS AREA





Baseline and projected annual SO_x emissions for the states adjacent to Nevada are shown in Figure 7-7, while Table 7-7 shows the percentage change in the inventories.

FIGURE 7-7

BASELINE AND PROJECTED SO_x EMISSIONS BY STATE

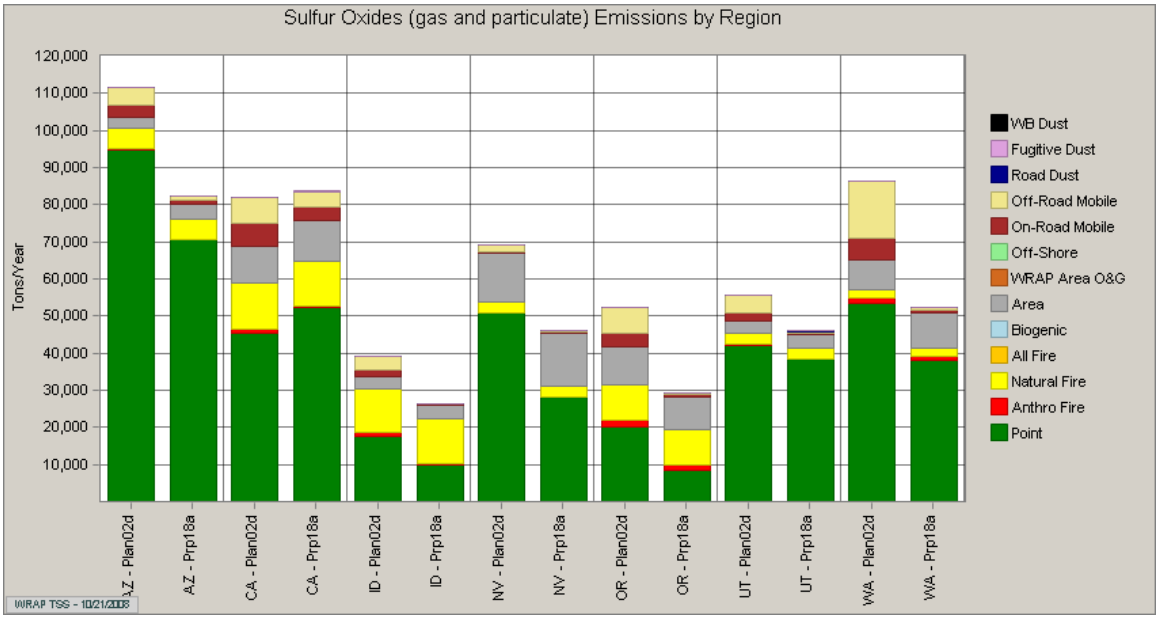


TABLE 7-7

BASELINE AND PROJECTED SO_x INVENTORIES BY STATE

State	Plan02d	PRP18a	Percent Change
AZ	111,709	82,334	26.3%
CA	82,089	83,611	-1.9%
ID	39,163	26,465	32.4%
NV	68,979	46,224	33.0%
OR	52,449	29,336	44.1%
UT	55,640	45,916	17.5%
WA	86,323	52,493	39.2%

7.10 REASONABLE PROGRESS ASSESSMENT

Nevada has concluded that the emissions reductions due to federal, state and local "on-the-books" and "on-the-books" emissions control coupled with those resulting from the installation of BART requirements represent a reasonable long-term strategy for the first regional haze planning period. Modeled visibility improvement at the Jarbidge WA for the 20 percent worst days is expected to be better than the uniform rate of progress by 2018 based on reductions from

federal and state "on-the-books" and "on-the-books" emissions controls represented by the 18PRPa emissions inventory. Visibility on the 20 percent best days is also projected to improve in 2018 as a result of the emissions reductions expected from federal and state control programs.

Nevada's 2018 RPG shows better visibility improvement at the Jarbidge WA than the uniform rate of progress. This significant progress parallels the uniform rate of visibility improvement needed to restore natural visibility conditions by 2064 as required by the regional haze rule. Visibility impairment at the Jarbidge WA is dominated by emissions from natural or otherwise uncontrollable sources or areas. Air management agencies are unable to control emissions from natural sources, or emissions from sources beyond the purview of the United States' regulatory authority.

For these reasons, Nevada has concluded the long-term strategy identified and discussed herein makes reasonable progress toward the national goal of remedying existing impairment of visibility in the Jarbidge WA resulting from manmade air pollution for the first planning period. It is reasonable for Nevada to defer reductions to later planning periods in order to maintain a consistent glidepath toward the long-term goal.

Nevada's RPG is an interim goal representing incremental visibility improvement over the first planning period ending 2018. As such, Nevada will take into account the effects of other state and local controls when setting reasonable progress as they become available, even though they may not be federally enforceable programs. Nevada will take other states' SIPs and BART determinations into account during the first review and evaluation of our long-term strategy, modeling results and RPG.

To summarize, the regional haze SIP presented here documents the technical basis to determine our share of emissions reduction obligations necessary to achieve reasonable progress in the Jarbidge WA and other Class I areas affected by Nevada's emissions of visibility impairing pollutants. Nevada considers our progress to incrementally improve visibility at the Jarbidge WA and other Class I areas to be reasonable for the first regional haze planning period. In addition, Nevada has identified several scenarios that suggest additional reductions in Nevada's projected 2018 emissions inventory that will likely result in better projected visibility improvement at the mandatory Class I areas than currently predicted.

Under the long-term strategy described herein, there will be some additional visibility improvements that occur by 2018, beyond those reflected in the RPGs identified in Chapter Six. Beginning in 2009, Nevada will develop procedures and schedules for evaluation of source categories to determine what additional controls are appropriate to achieve further reasonable progress. This evaluation will take into account any new relevant monitoring and modeling information related to the contribution of Nevada anthropogenic sources to Class I impairment, new regulations that may benefit regional haze, and any new guidance related to the identifying additional control measures consistent with reasonable progress requirement of the regional haze rule. Nevada's commitment to progress reports and future plan revisions is discussed in Chapter Nine.