6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R10-OAR-2011-0367, FRL-9636-9]

Approval and Promulgation of Implementation Plans; State of Alaska; Regional Haze State Implementation Plan

AGENCY: Environmental Protection Agency (EPA)

ACTION: Proposed rule.

SUMMARY: EPA is proposing to approve a State Implementation Plan (SIP) revision, submitted by the State of Alaska on April 4, 2011, as meeting the requirements of Clean Air Act (CAA) sections169A and 169B, and Federal Regulations 40 CFR 51.308, to implement a regional haze program in the State of Alaska for the first planning period through July 31, 2018. This revision addresses the requirements of the Clean Air Act (CAA) and EPA's rules that require states to prevent any future and remedy any existing anthropogenic impairment of visibility in mandatory Class I areas caused by emissions of air pollutants from numerous sources located over a wide geographic area (also referred to as the ''regional haze program''). Additionally, EPA proposes to approve the Alaska Department of Environmental Conservation Best Available Retrofit Technology regulations at 18 AAC 50.260.

DATES: Written comments must be received at the address below on or before **[insert date 30 days from the date of publication in the Federal Register]**

- **ADDRESSES:** Submit your comments, identified by Docket ID No. EPA-R10-OAR-2011-0367, by one of the following methods:
    - www.regulations.gov: Follow the on-line instructions for submitting comments.
    - E-mail: R10-Public_Comments@epa.gov
    - Mail: Keith Rose, EPA Region 10, Office of Air, Waste and Toxics, AWT-107, 1200 Sixth Avenue, Suite 900, Seattle, WA 98101
    - Hand Delivery/Courier: EPA Region 10, 1200 Sixth Avenue, Suite 900, Seattle, WA 98101. Attention: Keith Rose, Office of Air, Waste and Toxics, AWT-107. Such deliveries are only accepted during normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA-R10-OAR-2011-0367. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at http://www.regulations.gov, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through http://www.regulations.gov or e-mail. The http://www.regulations.gov Web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA, without going through http://www.regulations.gov, your e-mail address will be

automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at http://www.epa.gov/epahome/dockets.htm.

Docket: All documents in the docket are listed in the http://www.regulations.gov index. Although listed in the index, some information is not publicly available (e.g., CBI or other information whose disclosure is restricted by statute). Certain other material, such as copyrighted material, will be publicly available only in hard copy form. Publicly available docket materials are available either electronically at http://www.regulations.gov or in hard copy at the Office of Air, Waste and Toxics, EPA Region 10, 1200 Sixth Avenue, Seattle, WA 98101. EPA requests that if at all possible, you contact the individual listed below to view the hard copy of the docket.

FOR FURTHER INFORMATION CONTACT: Mr. Keith Rose at telephone number (206) 553-1949, rose.keith@epa.gov or the above EPA, Region 10 address.

SUPPLEMENTARY INFORMATION: Throughout this document whenever "we," "us," or "our" is used, we mean the EPA. Information is organized as follows:

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I. Background for EPA's Proposed Action

In the CAA Amendments of 1977, Congress established a program to protect and improve visibility in the national parks and wilderness areas. See CAA section 169A. Congress amended the visibility provisions in the CAA in 1990 to focus attention on the problem of regional haze. See CAA section 169B. EPA promulgated regulations in 1999 to implement sections 169A and 169B of the Act. These regulations require states to develop and implement plans to ensure reasonable progress toward improving visibility in mandatory Class I Federal areas[1] (Class I areas). 64 FR 35714 (July 1, 1999); see also 70 FR 39104 (July 6, 2005) and 71 FR 60612 (October 13, 2006).

[1]Areas designated as mandatory Class I Federal areas consist of national parks exceeding 6000 acres, wilderness areas and national memorial parks exceeding 5000 acres, and all international parks that were in existence on August 7, 1977. 42 U.S.C. 7472(a). In accordance with section 169A of the CAA, EPA, in consultation with the Department of Interior, promulgated a list of 156 areas where visibility is identified as an important value. 44 FR 69122 (November 30, 1979). The extent of a mandatory Class I area includes subsequent changes in boundaries, such as park expansions. 42 U.S.C. 7472(a). Although states and tribes may designate as Class I additional areas which they consider to have visibility as an important value, the requirements of the visibility program set forth in section 169A of the CAA apply only to ''mandatory Class I Federal areas." Each mandatory Class I Federal area is the responsibility of a ''Federal Land Manager.'' 42 U.S.C. 7602(i). When we use the term "Class I area" in this action, we mean a "mandatory Class I Federal area."

The Alaska Department of Environmental Conservation (ADEC) adopted and transmitted its "Alaska Regional Haze State Implementation Plan" (Alaska Regional Haze SIP) to EPA Region 10 in a letter dated March 29, 2011. EPA determined the plan complete by operation of law on September 4, 2011. As a result of the Alaska's participation with 13 other states, tribal nations and federal agencies in the Western Regional Air Partnership (WRAP), Alaska's Regional Haze SIP reflects a consistent approach toward addressing regional visibility impairment at 116 Class I areas in the West.

In this action, EPA is proposing to approve all provisions of Alaska's Regional Haze SIP submission, including the requirements for the calculation of baseline and natural visibility conditions, statewide inventory of visibility-impairing pollutants, best available retrofit technology (BART), Reasonable Progress Goals (RPGs), and Long-Term Strategy (LTS). EPA is also proposing to approve the Alaska Department of Environmental Conservation (ADEC) BART regulations at 18 AAC 50.260.

A. Definition of Regional Haze

Regional haze is impairment of visual range, clarity or colorization caused by emission of air pollution produced by numerous sources and activities, located across a broad regional area. The sources include but are not limited to, major and minor stationary sources, mobile sources, and area sources including non-anthropogenic sources. These sources and activities may emit fine particles (PM2.5) (*e.g.,* sulfates, nitrates, organic carbon, elemental carbon, and soil dust), and their precursors (*e.g.,* SO2, NOX, and in some cases, ammonia (NH3) and volatile organic

compounds (VOC)). Atmospheric fine particulate reduces clarity, color, and visual range of visual scenes. Visibility-reducing fine particulates are primarily composed of sulfate, nitrate, organic carbon compounds, elemental carbon, and soil dust, and impair visibility by scattering and absorbing light. Fine particulate can also cause serious health effects and mortality in humans, and contributes to environmental effects such as acid deposition and eutrophication. See 64 FR at 35715.

Data from the existing visibility monitoring network, the "Interagency Monitoring of Protected Visual Environments" (IMPROVE) monitoring network, show that visibility impairment caused by air pollution occurs virtually all the time at most national parks and wilderness areas. The average visual range in many Class I areas in the Western United States is 100-150 kilometers, or about one-half to two-thirds the visual range that would exist without anthropogenic air pollution. Id. Visibility impairment also varies day-to-day and by season depending on variation in meteorology and emission rates.

B. Regional Haze Rules and Regulations

In section 169A of the 1977 CAA Amendments, Congress created a program for protecting visibility in the nation's national parks and wilderness areas. This section of the CAA establishes as a national goal the "prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution." CAA section 169A(a)(1). On December 2, 1980, EPA promulgated regulations to address visibility impairment in Class I areas that is "reasonably attributable" to a single source or small

group of sources, i.e., "reasonably attributable visibility impairment". See 45 FR 80084. These regulations represented the first phase in addressing visibility impairment. EPA deferred action on regional haze that emanates from a variety of sources until monitoring, modeling, and scientific knowledge about the relationships between pollutants and visibility impairment were improved.

Congress added section 169B to the CAA in 1990 to address regional haze issues. EPA promulgated a rule to address regional haze on July 1, 1999 (64 FR 35713), the regional haze rule or RHR. The RHR revised the existing visibility regulations to integrate into the regulation provisions addressing regional haze impairment and established a comprehensive visibility protection program for Class I areas. The requirements for regional haze, found at 40 CFR 51.308 and 51.309, are included in EPA's visibility protection regulations at 40 CFR 51.300-309. Some of the main elements of the regional haze requirements are summarized in section II of this proposed rulemaking. The requirement to submit a regional haze SIP applies to all 50 states, the District of Columbia and the Virgin Islands.[2] 40 CFR 51.308(b) requires states to submit the first implementation plan addressing regional haze visibility impairment no later than December 17, 2007.

C. Roles of Agencies in Addressing Regional Haze

Successful implementation of the regional haze program will require long-term regional coordination among states, tribal governments, and various Federal agencies. As noted above,

[2]Albuquerque/Bernalillo County in New Mexico must also submit a regional haze SIP to completely satisfy the requirements of section 110(a)(2)(D) of the CAA for the entire State of New Mexico under the New Mexico Air Quality Control Act (section 74-2-4).

pollution affecting the air quality in Class I areas can be transported over long distances, even hundreds of kilometers. Therefore, to effectively address the problem of visibility impairment in Class I areas, States need to develop strategies in coordination with one another, taking into account the effect of emissions from one jurisdiction on the air quality in another.

Because the pollutants that lead to regional haze impairment can originate from across state lines, EPA has encouraged the States and Tribes to address visibility impairment from a regional perspective. Five regional planning organizations [3](RPOs) were created nationally to address regional haze and related issues. One of the main objectives of the RPOs is to develop and analyze data and conduct pollutant transport modeling to assist the States or Tribes in developing their regional haze plans.

The Western Regional Air Partnership (WRAP)[4], one of the five RPOs nationally, is a voluntary partnership of State, Tribal, Federal, and local air agencies dealing with air quality in the West. WRAP member States include: Alaska, Arizona, California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming. WRAP Tribal members include Campo Band of Kumeyaay Indians, Confederated Salish and Kootenai Tribes, Cortina Indian Rancheria, Hopi Tribe, Hualapai Nation of the Grand Canyon, Native Village of Shungnka, Nez Perce Tribe, Northern Cheyenne Tribe, Pueblo of Acoma, Pueblo of San Felipe, and Shoshone-Bannock Tribes of Fort Hall.

[3] See http://www.epa.gov/air/visibility/regional.html for description of the regional planning organizations.
[4] The WRAP website can be found at http://www.wrapair.org.

As a result of the regional planning efforts in the West, all states in the WRAP region contributed information to a Technical Support System (TSS) which provides an analysis of the causes of haze, and the levels of contribution from all sources within each state to the visibility degradation of each Class I area. The WRAP States consulted in the development of reasonable progress goals, using the products of this technical consultation process to co-develop their reasonable progress goals for the Western Class I areas. The modeling done by the WRAP relied on assumptions regarding emissions over the relevant planning period and embedded in these assumptions were anticipated emissions reductions in each of the States in the WRAP, including reductions from BART and other measures to be adopted as part of the State's long term strategy for addressing regional haze. The reasonable progress goals in the draft and final regional haze SIPs that have now been prepared by States in the West accordingly are based, in part, on the emissions reductions from nearby States that were agreed on through the WRAP process.

II. Requirements for Regional Haze SIPs

A. The CAA and the Regional Haze Rule

Regional haze SIPs must assure reasonable progress towards the national goal of achieving natural visibility conditions in Class I areas. Section 169A of the CAA and EPA's implementing regulations require states to establish long-term strategies for making reasonable progress toward meeting this goal. Implementation plans must also give specific attention to certain stationary sources that were in existence on August 7, 1977, but were not in operation before August 7, 1962, and require these sources, where appropriate, to install BART controls

for the purpose of eliminating or reducing visibility impairment. The specific regional haze SIP requirements are discussed in further detail below.

B. Determination of Baseline, Natural Conditions, and Visibility Improvement

The RHR establishes the deciview (dv) as the principal metric for measuring visibility. This visibility metric expresses uniform changes in haziness in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions. Visibility is determined by measuring the visual range (or deciview), which is the greatest distance, in kilometers or miles, at which a dark object can be viewed against the sky. The deciview is a useful measure for tracking progress in improving visibility, because each deciview change is an equal incremental change in visibility perceived by the human eye. Most people can detect a change in visibility at one deciview.[5]

The deciview is used in expressing reasonable progress goals (which are interim visibility goals towards meeting the national visibility goal), defining baseline, current, and natural conditions, and tracking changes in visibility. The regional haze SIPs must contain measures that ensure "reasonable progress" toward the national goal of preventing and remedying visibility impairment in Class I areas caused by manmade air pollution by reducing anthropogenic emissions that cause regional haze. The national goal is a return to natural conditions, i.e., anthropogenic sources of air pollution would no longer impair visibility in Class I areas.

[5]The preamble to the RHR provides additional details about the deciview. 64 FR 35714, 35725 (July 1, 1999).

To track changes in visibility over time at each of the 156 Class I areas covered by the visibility program (40 CFR 81.401-437), and as part of the process for determining reasonable progress, states must calculate the degree of existing visibility impairment at each Class I area at the time of each regional haze SIP submittal and periodically review progress every five years midway through each 10-year implementation period. To do this, the RHR requires states to determine the degree of impairment (in deciviews) for the average of the 20% least impaired ("best") and 20% most impaired ("worst") visibility days over a specified time period at each of their Class I areas. In addition, states must also develop an estimate of natural visibility conditions for the purpose of comparing progress toward the national goal. Natural visibility is determined by estimating the natural concentrations of pollutants that cause visibility impairment, and then calculating total light extinction based on those estimates. EPA has provided guidance to states regarding how to calculate baseline, natural and current visibility conditions in documents titled, EPA's *Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule*, September 2003, (EPA-454/B-03-005 located at http://www.epa.gov/ttncaaa1/t1/memoranda/rh_envcurhr_gd.pdf), (hereinafter referred to as "EPA's 2003 Natural Visibility Guidance"), and *Guidance for Tracking Progress Under the Regional Haze Rule* (EPA-454/B-03-004 September 2003 located at http://www.epa.gov/ttncaaa1/t1/memoranda/rh_tpurhr_gd.pdf)), (hereinafter referred to as "EPA's 2003 Tracking Progress Guidance").

For the first regional haze SIPs that were due by December 17, 2007, "baseline visibility conditions" were the starting points for assessing "current" visibility impairment. Baseline visibility conditions represent the degree of visibility impairment for the 20% least impaired days

and 20% most impaired days for each calendar year from 2000 to 2004. Using monitoring data for 2000 through 2004, States are required to calculate the average degree of visibility impairment for each Class I area, based on the average of annual values over the five-year period. The comparison of initial baseline visibility conditions to natural visibility conditions indicates the amount of improvement necessary to attain natural visibility, while the future comparison of baseline conditions to the then-current conditions will indicate the amount of progress made. In general, the 2000-2004 baseline time period is considered the time from which improvement in visibility is measured.

C. Best Available Retrofit Technology

Section 169A of the CAA directs states to evaluate the use of retrofit controls at certain larger, often uncontrolled, older stationary sources in order to address visibility impacts from these sources. Specifically, section 169A(b)(2)(A) of the CAA requires States to revise their SIPs to contain such measures as may be necessary to make reasonable progress towards the natural visibility goal, including a requirement that certain categories of existing major stationary sources[6] built between 1962 and 1977 procure, install, and operate the "Best Available Retrofit Technology" ("BART") as determined by the state. States are directed to conduct BART determinations for such sources that may be anticipated to cause or contribute to any visibility impairment in a Class I area. Rather than requiring source-specific BART controls, states also have the flexibility to adopt an emissions trading program or other alternative program as long as the alternative provides greater reasonable progress towards improving visibility than BART.

[6]The set of "major stationary sources" potentially subject to BART is listed in CAA section 169A(g)(7).

On July 6, 2005, EPA published the *Guidelines for BART Determinations Under the Regional Haze Rule* at appendix Y to 40 CFR Part 51 (hereinafter referred to as the "BART Guidelines") to assist states in determining which of their sources should be subject to the BART requirements and in determining appropriate emission limits for each applicable source. In making a BART applicability determination for a fossil fuel-fired electric generating plant with a total generating capacity in excess of 750 megawatts, a state must use the approach set forth in the BART Guidelines. A State is encouraged, but not required, to follow the BART Guidelines in making BART determinations for other types of sources.

States must address all visibility-impairing pollutants emitted by a source in the BART determination process. The most significant visibility-impairing pollutants are sulfur dioxide, nitrogen oxides, and fine particulate matter. EPA has indicated that states should use their best judgment in determining whether volatile organic compounds or ammonia compounds impair visibility in Class I areas.

Under the BART Guidelines, States may select an exemption threshold value for their BART modeling, below which a BART-eligible source would not be expected to cause or contribute to visibility impairment in any Class I area. The State must document this exemption threshold value in the SIP and must state the basis for its selection of that value. Any source with emissions that model above the threshold value would be subject to a BART determination. The BART Guidelines acknowledge varying circumstances affecting different Class I areas. States should consider the number of emission sources affecting the Class I areas at issue and the

magnitude of the individual sources' impacts. Generally, an exemption threshold set by the State should not be higher than 0.5 deciviews (dv).

In their SIPs, States must identify potential BART sources and BART-eligible sources that have a visibility impact in any Class I area above the 'BART subject' threshold established by the State and thus, are 'subject' to BART. States must document their BART control analysis and determination for all sources subject to BART.

The term "BART-eligible" source used in the BART Guidelines means the collection of individual emission units at a facility that together comprises the BART-eligible source. In making BART determinations, section 169A(g)(2) of the CAA requires that States consider the following factors: (1) the costs of compliance, (2) the energy and non-air quality environmental impacts of compliance, (3) any existing pollution control technology in use at the source, (4) the remaining useful life of the source, and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. States are generally free to determine the weight and significance to be assigned to each factor.

The regional haze SIP must include source-specific BART emission limits and compliance schedules for each source subject to BART. Once a State has made its BART determination, the BART controls must be installed and in operation as expeditiously as practicable, but no later than five years after the date EPA approves the regional haze SIP. See CAA section 169A(g)(4)); 40 CFR 51.308(e)(1)(iv). In addition to what is required by the RHR, general SIP requirements mandate that the SIP must also include all regulatory

requirements related to monitoring, recordkeeping, and reporting for the BART controls on the source.

D. Reasonable Progress Goals

The vehicle for ensuring continuing progress towards achieving the natural visibility goal is the submission of a series of regional haze SIPs that establish two Reasonable Progress Goals (RPGs) (i.e., two distinct goals, one for the "best" and one for the "worst" days) for every Class I area for each (approximately) ten-year implementation period. The RHR does not mandate specific milestones or rates of progress, but instead calls for states to establish goals that provide for "reasonable progress" toward achieving natural visibility conditions. In setting reasonable progress goals (RPGs), states must provide for an improvement in visibility for the most impaired days over the (approximately) ten-year period of the SIP, and ensure no degradation in visibility for the least impaired days over the same period.

States have significant discretion in establishing RPGs, but are required to consider the following factors established in section 169A of the CAA and in EPA's RHR at 40 CFR 51.308(d)(1)(i)(A): (1) the costs of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of any potentially affected sources. States must demonstrate in their SIPs how these factors are considered when selecting the RPGs for the best and worst days for each applicable Class I area. States have considerable flexibility in how they take these factors into consideration, as noted in EPA's *Guidance for Setting Reasonable Progress Goals under the Regional Haze*

Program, July 1, 2007, Memorandum from William L. Wehrum, Acting Assistant Administrator for Air and Radiation, to EPA Regional Administrators, EPA Regions 1-10 (pp. 4-2, 5-1) ("EPA's Reasonable Progress Guidance"). In setting the RPGs, states must also consider the rate of progress needed to reach natural visibility conditions by 2064 (referred to as the "uniform rate of progress" (URP) or the "glide path") and the emission reduction measures needed to achieve that rate of progress over the ten-year period of the SIP. Uniform rate of progress represents a rate of progress that states are to use for comparison to the amount of progress they expect to achieve over the ten-year period. In setting RPGs, each state with one or more Class I areas ("Class I state") must also consult with potentially "contributing states," i.e., other nearby states with emission sources that may be affecting visibility impairment at the Class I state's areas. See 40 CFR 51.308(d)(1)(iv).

E. Long-Term Strategy

Consistent with the requirement in section 169A(b) of the CAA that states include in their regional haze SIP a ten to fifteen-year strategy for making reasonable progress, section 51.308(d)(3) of the RHR requires that states include a long-term strategy (LTS) in their regional haze SIPs. The LTS is the compilation of all control measures a state will use during the implementation period of the specific SIP submittal to meet applicable RPGs. The LTS must include "enforceable emissions limitations, compliance schedules, and other measures needed to achieve the reasonable progress goals" for all Class I areas within and affected by emissions from the state. 40 CFR 51.308(d)(3).

When a state's emissions are reasonably anticipated to cause or contribute to visibility impairment in a Class I area located in another state, the RHR requires the impacted state to coordinate with contributing states to develop coordinated emissions management strategies. 40 CFR 51.308(d)(3)(i). In such cases, the contributing state must demonstrate that it has included in its SIP all measures necessary to obtain its share of the emission reductions needed to meet the RPGs for the Class I area. The RPOs have provided forums for significant interstate consultation, but additional consultation between states may be required to sufficiently address interstate visibility issues (e.g., where two states belong to different RPOs).

States should consider all types of anthropogenic sources of visibility impairment in developing their LTS, including stationary, minor, mobile, and area sources. At a minimum, states must describe how each of the following seven factors listed below are taken into account in developing their LTS: (1) emission reductions due to ongoing air pollution control programs, including measures to address RAVI; (2) measures to mitigate the impacts of construction activities; (3) emissions limitations and schedules for compliance to achieve the RPG; (4) source retirement and replacement schedules; (5) smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the state for these purposes; (6) enforceability of emissions limitations and control measures; and, (7) the anticipated net effect on visibility due to projected changes in point, area, and mobile source emissions over the period addressed by the LTS. 40 CFR 51.308(d)(3)(v).

F. Coordinating Regional Haze and Reasonably Attributable Visibility Impairment (RAVI)

As part of the RHR, EPA revised 40 CFR 51.306(c) regarding the LTS for RAVI to require that the RAVI plan must provide for a periodic review and SIP revision not less frequently than every three years until the date of submission of the state's first plan addressing regional haze visibility impairment, which was due December 17, 2007, in accordance with 40 CFR 51.308(b) and (c). On or before this date, the state must revise its plan to provide for review and revision of a coordinated LTS for addressing RAVI and regional haze, and the state must submit the first such coordinated LTS with its first regional haze SIP. Future coordinated LTS's, and periodic progress reports evaluating progress towards RPGs, must be submitted consistent with the schedule for SIP submission and periodic progress reports set forth in 40 CFR 51.308(f) and 51.308(g), respectively. The periodic review of a state's LTS must provide the status of both regional haze and RAVI impairment, and must be submitted to EPA as a SIP revision.

G. Monitoring Strategy and Other Implementation Plan Requirements

Section 51.308(d)(4) of the RHR requires a monitoring strategy for measuring, characterizing, and reporting on regional haze visibility impairment that is representative of all mandatory Class I areas within the state. The strategy must be coordinated with the monitoring strategy required in 40 CFR 51.305 for RAVI. Compliance with this requirement may be met through "participation" in the Interagency Monitoring of Protected Visual Environments (IMPROVE) network, i.e., review and use of monitoring data from the network. The monitoring strategy is due with the first regional haze SIP, and it must be reviewed every five years. The monitoring strategy must also provide for additional monitoring sites if the IMPROVE network

is not sufficient to determine whether RPGs will be met. The SIP must also provide for the following:

- Procedures for using monitoring data and other information in a state with mandatory Class I areas to determine the contribution of emissions from within the state to regional haze visibility impairment at Class I areas both within and outside the state;
- Procedures for using monitoring data and other information in a state with no mandatory Class I areas to determine the contribution of emissions from within the state to regional haze visibility impairment at Class I areas in other states;
- Reporting of all visibility monitoring data to the Administrator at least annually for each Class I area in the state, and where possible, in electronic format;
- Developing a statewide inventory of emissions of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any Class I area. The inventory must include emissions for a baseline year, emissions for the most recent year for which data are available, and estimates of future projected emissions. A state must also make a commitment to update the inventory periodically; and,
- Other elements, including reporting, recordkeeping, and other measures necessary to assess and report on visibility.

H. SIP Revisions and Five Year Progress Reports

The RHR requires control strategies to cover an initial implementation period through 2018, with a comprehensive reassessment and revision of those strategies, as appropriate, every ten years thereafter. Periodic SIP revisions must meet the core requirements of 40 CFR 51.308(d)

with the exception of BART. The requirement to evaluate sources for BART applies only to the first regional haze SIP. Facilities subject to BART must continue to comply with the BART provisions of 40 CFR 51.308(e), as noted above. Periodic SIP revisions will assure that the statutory requirement of reasonable progress will continue to be met.

Each state also is required to submit a report to EPA every five years that evaluates progress toward achieving the RPG for each Class I area within the state and outside the state if affected by emissions from within the state. 40 CFR 51.308(g). The first progress report is due five years from submittal of the initial regional haze SIP revision. At the same time a 5-year progress report is submitted, a state must determine the adequacy of its existing SIP to achieve the established goals for visibility improvement. See 40 CFR 51.308(h).

I. Consultation with States and Federal Land Managers

The RHR requires that states consult with Federal Land Managers (FLMs) before adopting and submitting their SIPs. See 40 CFR 51.308(i). States must provide FLMs an opportunity for consultation, in person and at least 60 days prior to holding any public hearing on the SIP. This consultation must include the opportunity for the FLMs to discuss their assessment of visibility impairment in any Class I area and to offer recommendations on the development of the reasonable progress goals and on the development and implementation of strategies to address visibility impairment. Further, a state must include in its SIP a description of how it addressed any comments provided by the FLMs. Finally, a SIP must provide procedures for continuing consultation

between the state and FLMs regarding the state's visibility protection program, including development and review of SIP revisions, five-year progress reports, and the implementation of other programs having the potential to contribute to impairment of visibility in Class I areas.

III. EPA's Analysis of Alaska's Regional Haze SIP

A. Affected Class I Areas

Alaska has four Class I areas within the state. These four Class I areas are Denali National Park, Simeonof Wilderness Area, Tuxedni National Wildlife Refuge, and Bering Sea Wilderness Area. ADEC has not identified any other state that is impacting the Class I areas in Alaska, and Alaska has not been identified as a contributor to impacts in other state's Class I areas. However, in accordance with 40 CFR 51.308(d)(1)(iv) and 51.308(d)(3)(i), ADEC commits to continue consultation with states which may reasonably be anticipated to cause or contribute to visibility impairment in federal Class I areas located within Alaska. ADEC will also continue consultation with any state for which Alaska's emissions may reasonably be anticipated to cause or contribute to visibility impairment in that state's federal Class I areas.

B. Baseline, Natural Conditions and Visibility Improvement

Alaska, using data from the IMPROVE monitoring network and analyzed by WRAP, calculated current baseline and natural visibility conditions, and the uniform rate of progress

(URP)[7] for Denali National Park, Simeonof Wilderness Area and Tuxedni Wildlife Refuge. Baseline visibility for the most-impaired (20% worst) days and the least-impaired (20% best) days was calculated from monitoring data collected by IMPROVE monitors. The IMPROVE monitoring sites for each Class I area are:

- Denali National Park – Denali National Park has two visibility monitors. One site is located at the Denali National Park Headquarters (DENA1), which has operated since 1988, and the second is the Trapper Creek monitoring site (TRCR1) located 100 yards east of the Trapper Creek Elementary School, west of the Town of Trapper Creek. The monitor located at Trapper Creek is the official IMPROVE site for Denali National Park and was established in September 2001 to evaluate the long-range transport of pollution into the Park from the south.
- Simeonof Wilderness Area - The Simeonof Wilderness Area is located on a remote, isolated island in the Aleutian chain approximately 58 miles from mainland Alaska. The Fish and Wildlife Service has placed an IMPROVE air monitor in the community of Sand Point, Alaska to represent this wilderness area. The community is on a more accessible island approximately 60 miles north west of the Simeonof Wilderness Area. The monitor has been operating since September 2001.
- Tuxedni National Wildlife Refuge – Tuxedni National Wildlife Refuge is located on a relatively remote pair of islands in Tuxedni Bay off of Cook Inlet in Southcentral Alaska. The Fish and Wildlife Service has installed an IMPROVE monitor near Lake Clark National Park to represent conditions at Tuxedni Wilderness Area. This site is located on the west side of Cook Inlet, approximately 5 miles from the Tuxedni National Wildlife

[7] The URP is also referred to as the visibility "glidepath", which is the linear rate of progress needed to achieve natural visibility conditions by 2064.

Refuge. The site was operational as of December 18, 2001, and represents regional haze conditions for the wilderness area.

- Bering Sea Wilderness Area – This wilderness area encompasses St. Matthew Island, Hall Island, and Pinnacle Island and is part of the larger Bering Sea unit of the Alaska Maritime National Wildlife Refuge. The Bering Sea Wilderness area is extremely remote and located approximately 350 miles southwest of Nome, Alaska and is surrounded on all sides by the Bering Sea. There is essentially no electricity or other infrastructure to support a monitor. Additionally, the area is hundreds of miles away from population centers or major stationary sources. This area had a DELTA-DRUM sampler (a mobile sampler) installed during a field visit in 2002. However, difficulties were encountered with the power supply and no viable data are available, therefore ADEC is not able to determine baseline visibility conditions for this site. Due to its inaccessibility, remoteness, and harsh environment, no IMPROVE monitoring is available or is currently planned for the Bering Sea Wilderness Area.

In general, WRAP based their estimates of natural conditions on EPA's 2003 Natural Visibility Guidance, but incorporated refinements which EPA believes provides results more appropriate for Alaska than the general EPA default approach. These refinements include the use of an updated IMPROVE algorithm which uses a higher ratio of organic mass concentration to organic carbon mass, which better accounts for haze from organic mass, and includes a term for sea salt, which causes a significant amount of haze in the Tuxedni and Simeonof Class I areas. See WRAP Technical Support Document, February 28, 2011 (WRAP TSD) section 2.D and 2.E, supporting this action.

Table 1 below shows visibility conditions in Denali National Park, Simeonof Wilderness Area and Tuxedni National Wildlife Refuge for the 20% worst natural visibility days, the 20% worst baseline days, the 2018 URP, and the visibility improvement needed between 2002 and 2018 to achieve the URP. Table 2 shows visibility conditions on the 20% best days.

Table 1. 20% Worst Day Visibility Conditions

Site	Class I Area	20% Worst Natural Conditions (dv)	20% Worst Baseline Conditions (dv)	2018 Uniform Rate of Progress (dv)	Visibility Improvement needed by 2018 (dv)
DENA1	Denali	7.3	9.9	9.5	0.4
TRCR1	Denali	8.4	11.6	11.1	0.5
SIME1	Simeonof	15.6	18.6	18.1	0.5
TUXE1	Tuxedni	11.3	14.1	13.6	0.5

Table 2. 20% Best Day Visibility Conditions

Site	Class I area	20% Best Baseline Conditions (dv)	20% Best Natural Conditions (dv)
DENA1	Denali	2.4	1.8
TRCR1	Denali	3.5	2.7
SIME1	Simeonof	7.6	5.3
TUXE1	Tuxedni	4.0	3.2

Based on IMPROVE data collected in the Class I areas in Alaska during the baseline period (2000-2004), the major pollutants that contribute to light extinction on the 20% worst days at the Simeonof site are: sea salt (47%), sulfates (29%), and organic mass concentration (OMC) (9%); at the Denali DENA1 site are: OMC (54%), sulfates (25%), elemental carbon

(8%); at the Denali TRCR1 site are: OMC (43%), sulfates (35%), coarse matter (7%); and at the Tuxedni site are: OMC (28%), sea salt (26%), sulfate (28%).

As noted previously, due to the remote location of the Class I area in the Bering Sea, no monitoring site exists in this Class I area and insufficient data are available to accurately calculate baseline values for this Class I area. The area is located a considerable distance off shore in the Bering Sea and is hundreds of miles from any other monitoring location. Alaska evaluated and discussed the origins and influence of aerosols to this Class I area, and concluded that significant impacts from local industrial, commercial or community developments are unlikely. Future impacts from potential offshore oil and gas development is a remote possibility, but is also unlikely as there are no offshore oil and gas developments currently planned for the St. Matthew-Hall area, or the adjoining Aleutian Basin, Bowers Basin, and Aleutian Arc areas. Finally Alaska indicates that it will continue to evaluate the possibility for portable sampling in remote locations as resources allow. Alaska Regional Haze SIP submittal III.K.3-17. EPA acknowledges the provision in the RHR which provides that for Class I areas without monitoring data for 2000- 2004 the state should establish baseline values using the most representative available monitoring data for 2000- 2004 in consultation with the Administrator. 40 CFR 51.308 (d)(2)(i). However, as explained above and more fully described the SIP submission, representative data is not available for the Bering Sea Wilderness Area. Additionally, given the location of this Wilderness Area in the middle of the Bering Sea hundreds of miles off the coast of Alaska, it is likely that any sources impacting visibility in the area would be beyond Alaska's jurisdiction or ability to control. Also EPA expects the state to update any available monitoring or visibility impact analyses in its 5-year progress reports. Therefore, given the unique,

extremely remote and isolated location and the associated difficulties with monitoring at the area EPA proposes to accept Alaska's approach to the Bering Sea Wilderness Area.

Based on our evaluation of the State's baseline and natural conditions analysis, EPA is proposing to find that Alaska has appropriately determined baseline visibility for the average 20% worst and 20% best days, and natural visibility conditions for the average 20% worst days, and the visibility glidepath from the baseline conditions to natural conditions in the three Class I areas. See sections 2.D and 2.E of the WRAP TSD supporting this action. We also believe the State's analysis accurately determined the individual aerosol species causing impairment in the three Class I areas.

C. Alaska Emissions Inventories

There are three main categories of visibility-impairing air pollution sources: point sources, area sources, and mobile sources. Point sources are larger stationary sources that emit air pollutants. Area sources are large numbers of small sources that are widely distributed across an area, such as residential heating units, re-entrained dust from unpaved roads or windblown dust from agricultural fields. Mobile sources are sources such as motor vehicles, including agricultural and construction equipment, locomotives, and aircraft.

EPA's Regional Haze Rule requires a statewide emission inventory of pollutants that are reasonably anticipated to cause or contribute to visibility impairment in any mandatory Class I area. 40 CFR 51.308(d)(4)(v). ADEC compiled emission inventories for all visibility impairing

source categories in Alaska for the 2002 baseline year, and projected future emission inventories for these source categories in 2018. See Appendix III.K.5 of the SIP submittal. The fire sector of the baseline inventory was developed using 2000-2004 average data obtained from the WRAP Fire Inventory efforts. Emission estimates for 2018 were generated from anticipated population growth, growth in industrial activity, and emission reductions from implementation of control measures, e.g., implementation of BART limitations and motor vehicle tailpipe emissions. Chapter 5 of the Alaska Regional Haze SIP submittal discusses how emission estimates were determined for statewide emission inventories by pollutant and source category.

Key factors that were considered in the development of these regional haze emission inventories were:

Pollutants – Inventories were developed for the following pollutants: hydrocarbons (HC), carbon monoxide (CO), oxides of nitrogen (NOx), sulfur oxides (SOx), ammonia (NH3), volatile organic compounds (VOC), and coarse and fine particulate matter (PM10 and PM2.5, respectively).

Areal Extent and Spatial Resolution – The inventories represent sources within the entire state of Alaska, encompassing a total of 27 boroughs/counties. Emissions were allocated to individual grid cells, of 45 square kilometers each, in a rectangular grid domain covering all of Alaska. This grid domain was based on domain developed under an earlier WRAP study for which a modeling protocol was developed. See Figure III.K.5-2 of the SIP submittal.

Included Sources – Emission sources included known stationary point and area sources including fugitive dust and both anthropogenic and natural fires, and on-road and non-road

mobile sources. As discussed later in this section, biogenic (trees and vegetation) and geogenic sources (gas/oil seeps, wind erosion, and geothermal and volcanic activity) were not included.

Temporal Resolution – The inventories were expressed in the form of annual emissions for 2002 and 2018. For all source categories, except the fire sector, the baseline inventory was represented using calendar year 2002 annual emission estimates. The fire sector of the baseline inventory was developed using 2000-2004 average data obtained from the WRAP Fire Inventory efforts. These data reflect fire activity (from wildfires, wildland fires, and prescribed burns) averaged over this five-year period and are less likely to be biased by fire emissions from any individual year. See Alaska Regional Haze submittal III.K.5-3.

The 2018 inventory was developed to reflect emission levels projected to calendar year 2018, accounting for forecasted changes in source activity and emission factors. Population projections compiled by the Alaska Department of Labor and Workforce Development at five-year intervals through 2030 by individual borough and census area were used to grow 2002 baseline activity to 2018 for most of the source categories, with a couple of exceptions.

In developing its 2018 emission inventory, Alaska first determined that emission estimates for wildfires should be held constant between 2002 and 2018. However, as explained later, modest reductions in prescribed burn emissions were assumed, consistent with WRAP 2018b Phase III Fire Inventory forecast. Second, activity from small port commercial marine vessel activity in 2002 was assumed to be identical to that obtained for calendar year 2005.

Alaska also developed emission factors specific to calendar year 2018 for sources affected by regulatory control programs and technology improvements. These source sectors included on-road and non-road mobile sources (except commercial marine vessels and aviation) and stationary point sources. Alaska explained that the emissions forecast for 2018 does not include emissions from new or permitted sources that are not currently operating but which may be in operation in 2018. However, where the status of these facilities is known, Alaska further discussed the sources' influence on predicted emissions or visibility impact on a particular Class I area.

The SIP submittal identifies total annual emission estimates for visibility-impairing pollutants including SOx, NOx, VOC HC, CO, PM2.5, PM10 and NH3 for 2002 and 2018. These emission estimates were partitioned into eight emission source categories: point sources, stationary area sources (excluding fires), on-road mobile, non-road mobile, commercial marine vessels, aviation, anthropogenic fire (human caused), and natural wildfires. Biogenic emissions were not included in these regional haze inventories because no biogenic inventories have been developed for Alaska. Alaska indicates that given its northerly location, preponderance of snow and ice cover, and short growing season, it would be problematic to extrapolate "lower 48" biogenic emission factors and activity to it. Similarly, geogenic emissions were also excluded due to lack of available data. Additionally, Alaska did not include internationally transported emissions but cites to a number of studies that have attributed atmospheric aerosols measured in Alaska to contributions from upwind regions as far away as portions of Asia and Russia based on back trajectory analysis and identification of unique chemical source signatures. Alaska explains that robust emission estimates from these source areas are not available and thus there is no

accounting of these international, long-range transported sources. See Alaska Regional Haze SIP submittal III.K.5 for additional discussion of Alaska's emission estimates and inventory. See also WRAP TSD Chapter 3. Tables 2 and 3 below show total statewide emissions (in tons/year), by source sector and pollutant, for the calendar years 2002 and 2018, respectively. In addition to the totals across all source sectors, anthropogenic emission fractions (defined as all sectors except natural fires divided by total emissions) are also shown at the bottom of each table.

Table 3
2002 Alaska Statewide Regional Haze Inventory Summary

Source Sector	Annual Emissions (tons/year)						
	HC	CO	NOx	PM_{10}	$PM_{2.5}$	SOx	NH_3
Area, Excluding Wildfires	128,271	81,978	14,742	106,985	30,636	1,872	0
Non-Road	7,585	52,223	4,111	416	392	49	8
On-Road	7,173	80,400	7,077	204	158	324	307
Commercial Marine Vessels	356	2,880	11,258	663	643	4,979	5
Aviation (Aircraft)	1,566	21,440	3,265	699	667	335	6
Point	5,697	27,910	74,471	5,933	1,237	6,813	580
Wildfires, Anthropogenic	98	2,048	46	200	172	13	9
Wildfires, Natural	274,436	5,831,755	125,110	557,403	478,057	34,304	26,233
TOTAL - All Sources	**425,181**	**6,100,633**	**240,080**	**672,502**	**511,962**	**48,689**	**27,149**
Anthropogenic Fraction	**35.5%**	**4.4%**	**47.9%**	**17.1%**	**6.6%**	**29.5%**	**3.4%**

Alaska Regional Haze SIP submittal Table III.K.5-4

Table 4
2018 Alaska Statewide Regional Haze Inventory Summary

Source Sector	Annual Emissions (tons/year)						
	HC	CO	NOx	PM_{10}	$PM_{2.5}$	SOx	NH_3
Area, Excluding Wildfires	137,696	88,030	15,683	116,629	33,329	2,068	0
Non-Road	7,766	65,900	3,332	337	313	47	9
On-Road	2,946	44,881	2,881	138	74	39	340
Commercial Marine Vessels	616	4,751	16,205	1,031	1,192	1,129	9
Aviation (Aircraft & GSE)	1,799	24,387	3,810	794	757	386	7
Point	6,612	24,406	65,230	1,783	358	8,587	1,106
Fires, Anthropogenic	53	1,100	26	107	93	7	5
Fires, Natural	274,436	5,831,755	125,110	557,403	478,057	34,304	26,233

TOTAL - All Sources	**431,925**	**6,085,210**	**232,277**	**678,223**	**514,173**	**46,568**	**27,709**
Anthropogenic Fraction	**36.5%**	**4.2%**	**46.1%**	**17.8%**	**7.0%**	**26.3%**	**5.3%**

Alaska Regional Haze SIP submittal Table III.K.5-5

Significant changes in anthropogenic sector emission inventories of the primary visibility impairing pollutants, NOx, PM10, PM2.5, and SOx, between 2002 and 2018 are summarized below:

1. Non-road: NOx (-18.9%), PM10 (-19.1%), and PM2.5 (-20.2%)
2. On-road: NOx (-59.3%), PM10 (-32.3%), PM2.5 (-53.2%), and SOx (-87.9%)
3. Commercial Marine Vessels: NOx (+43.9%), PM10 (+55.5%), PM2.5 (+85.3%), and SOx (-77.3%)
4. Aviation: NOx (+16.7%), PM10 (+13.6%), PM2.5 (+13.5%), and SOx (15.5%)
5. Point: NOx (-12.4%), PM10 (-69.9%), PM2.5 (-71.1%), and SOx (+26.0%)
6. Anthropogenic Fires: NOx (-43.8%), PM10 (-46.2%), PM2.5 (-46.0%), and SOx (-43.8%)

The overall changes in the above pollutants between 2002 and 2018, across all source sectors, are NOx (-3.3%), PM10 (+0.9%), PM2.5 (+0.4%), and SOx (-4.4%). EPA is proposing to find that Alaska has appropriately determined the emissions for visibility impairing pollutants in Alaska for 2002 and 2018.

D. Sources of Visibility Impairment in Class I Areas in Alaska

Each pollutant species has its own visibility impairing property; for example, 1 ug/m3 of sulfate at high humidity is more effective in scattering light than 1 ug/m3 of organic carbon, and

therefore impairs visibility more than organic carbon. Following the approach recommended by the WRAP, and as explained more fully below, Alaska used a two step process to identify the contribution of each source or source category to existing visibility impairment. First, ambient pollutant concentration by species (such as sulfate, nitrate, organic carbon, and elemental carbon) was determined from the IMPROVE data collected for each Class I area. These concentrations were then converted into deciview values to distribute existing impairment among the measured pollutant species. The deciview value for each pollutant species was calculated by using the "revised IMPROVE equation" (See WRAP TSD, Section 2.C) to calculate extinction from each pollutant species concentration. Second, two regional visibility models, a back-trajectory model and a Weighted Emissions Potential (WEP) model, were used to determine which source categories contributed to the ambient concentration of each pollutant species.

As further explained in the SIP submittal, due to a number of constraints in developing a comprehensive Alaska emission inventory, rather than conducting photochemical modeling to determine current and future visibility conditions in Class I areas in Alaska, the WRAP selected alternate meteorological modeling techniques to determine current and future visibility conditions. WRAP used the two modeling techniques described below to determine visibility conditions in the Denali, Tuxedni, and Simeonof Class I areas:

Back-trajectory modeling was conducted to determine the path of air parcels impacting each Class I area. Back-trajectory analyses use interpolated measured or modeled meteorological fields to estimate the most likely central path over geographical areas that provided air to a receptor at any given time. The method essentially follows a parcel of air

backward in hourly steps for a specified period of time. Back trajectories account for the impact of wind direction and wind speed on delivery of emissions to the receptor, but do not account for chemical transformation, dispersion, and deposition of samples during transport.

Weighted Emissions Potential (WEP) analysis was used to determine how much each emission source area (sources within each gridded emission area) contributes to visibility impairment in the Denali, Simeonof, and Tuxedni Class I areas, based on both the baseline 2002 and the 2018 Alaska emissions inventories. This method does not account for chemistry and removal processes. Instead, the WEP analysis relies on an integration of gridded emissions data, meteorological back trajectory residence time data, a one-over-distance factor to approximate deposition and dispersion, and a normalization of the final results.

The results of the WEP analysis, conducted by WRAP for Alaska, identified the following source areas and source categories impacting visibility at the Denali National Park (measured at both the Denali and Trapper Creek IMPROVE sites), Simeonof Wilderness Area, and Tuxedni National Wildlife Refuge:

1. Denali National Park

Table III.K.7-1 of the SIP submittal summarizes the WEP values for Denali, based on data collected at the DENAL1 IMPROVE site, for the top three boroughs (Yukon-Koyukuk, Southeast Fairbanks, and Fairbanks North Star) for each pollutant on the 20% worst days. WEP predicts that 95 % of the total PM2.5 for 2002 came from these boroughs, and of that

amount, 95% came from natural fires in Yukon-Koyukuk and Southeast Fairbanks boroughs. For VOCs, natural wildfires in Yukon-Koyukuk and Southeast Fairbanks boroughs are the largest source, and stationary area sources in Denali Borough are the second largest source. For NOx contributions in 2002, 77% came from wildfires in Yukon-Koyukuk and Southeast Fairbanks boroughs, and about 13% came from point sources in the Fairbank North Star borough. For SOx contributions in 2002, 64% came from natural fires in Yukon-Koyukuk and Southeast Fairbanks boroughs, and 29% came from point sources in Fairbanks North Star borough. For ammonia contributions in 2002, 97% came from natural fires in Yukon-Koyukuk and Southeast Fairbanks boroughs. The State noted that natural fires are the dominant source for all of the pollutants identified at this monitoring site, and there are no other significant sources of PM2.5 other than natural fires. Overall, the information presented in Table III.K.7-1of the SIP submittal demonstrates that the only significant anthropogenic sources of concern impacting Denali are Fairbanks SO2 point sources.

Table III.K.7-3 of the SIP submittal shows the WEP values for Denali based on data collected at the Trapper Creek site. This table shows that natural fires are the largest source of emissions impacting this site, although there is also significant contribution from several anthropogenic source categories. In summary, 82% of the PM2.5 in 2002 came from natural fires in Yukon-Koyukuk and Southeast Fairbanks boroughs, and 11% of the PM2.5 came from point sources in the Matanuska-Susitna borough. For NOx, 32% of the contributions for 2002 came from natural fires in Yukon-Koyukuk borough, 20% came from point sources on the Kenai Peninsula and 16% came from on-road mobile sources in the Matanuska-Susitna borough. The contribution of NOx from on-road mobile sources is expected to drop to about half this value by

2018 due to the benefits of fleet turnover and increasingly stringent federal motor vehicle emissions standards. For SOx, 57% of the contributions for 2002 came from natural fires in the Yukon-Koyukuk borough, while 19% of the SOx came from stationary sources in the Matanuska-Susitna borough. Alaska has determined that natural fires are the dominant source for all of the visibility impairing pollutants at the Trapper Creek monitor in Denali National Park, but there is also a significant contribution from point sources on the Kenai Peninsula, and from on-road and stationary sources in the Matanuska-Susitna borough.

2. Simeonof Wilderness Area

A summary of the WEP values for the boroughs impacting Simeonof is presented in Table III.K.7-2 of the SIP submittal. The WEP analysis for this site shows that natural fires in the Yukon-Koyukuk borough are the dominant source of all pollutants impairing visibility. The WEP analysis concluded that 96% of the PM2.5, 87% of the VOCs, 76% of the NOx, 91% of the SOx, and 95% of the ammonia impacting Simeonof during 2000-2004 was from natural fires in the Yukon-Koyukuk borough. Alaska indicated that the forecast for emissions from natural fires in 2018 impacting the Simeonof Class I area are the same as for the baseline, which means that the visibility impacts from anthropogenic sources is expected to remain relatively small compared to contributions from natural fires through 2018 at this site.

3. Tuxedni National Wildlife Refuge Area

The information presented in Table III.K.7-4 of the SIP submittal shows a complex mixture of anthropogenic and natural source contributions that impact visibility at the Tuxedni National Wildlife Refuge. While natural fires are still the most significant source for many of the pollutants, (including 78% of the PM2.5, 41% of the VOCs, 44% of the SOx, and 54% of the ammonia), 64% of the NOx that impacts Tuxedni comes from point sources on the Kenai Peninsula. Anthropogenic sources projected to significantly impact Tuxedni in 2018 are: 1) point and stationary sources on the Kenai Peninsula, which will contribute 44% of the VOCs impacting Tuxedni, and 2) stationary areas sources on the Kenai Peninsula, which will contribute 37% of the SOx impacting Tuxedni.

EPA is proposing to find that Alaska has used appropriate air quality models to identify the primary pollutants, and source areas for these pollutants, impacting the Denali, Simeonof, and Tuxedni Class I areas. EPA is also proposing to find that the SIP submittal contains an appropriate analysis of the impact of these pollutants on visibility in each of the Class I areas in Alaska. See WRAP TSD Chapter 6.B (EPA's analysis of the WRAP's WEP analysis for Alaska).

E. Best Available Retrofit Technology (BART)

1. Alaska BART Regulations

Alaska has adopted new regulations at 18 AAC 50.260 (a)-(q) which provide the State with the authority to regulate BART sources in Alaska. In April 2007, ADEC proposed regulations to adopt the federal BART rules into 18 AAC 50.260 to establish the process and

specific steps for the BART eligible sources to follow to provide the analysis necessary for ADEC to make BART determinations. ADEC's regulations adopting the federal BART rules were promulgated on December 30, 2007 and submitted to EPA for inclusion in the SIP on February 7, 2008. The essential elements of these regulations are summarized below.

In 18 AAC 50.260(a), ADEC adopts the federal BART guidelines at 40 CFR part 51 Appendix Y and the definitions at 40 CFR 51.301 with specified exceptions where the definition at AS 46.14.990 is used. 18 AAC 50.260(b) specifies that sources subject to BART be identified in accordance with Section III of the BART guideline and sets the date by which ADEC will notify subject sources of their status.

18 AAC 50.260(c) establishes the procedures by which a source can request an exemption from BART by submitting a visibility impact analysis showing that the source is not reasonably anticipated to cause or contribute to any impairment of visibility in a Class I area.

18 AAC 50.260(d)-(l) establish the process that sources that did not request or receive an exemption or an Owner Requested Limit (ORL) must undertake to conduct a BART analysis, including visibility impact analysis modeling, to determine BART emission limits for sources that are subject to BART.

18 AAC 50.260(m) establishes how a final BART determination may be appealed.

18 AAC 50.260(n) establishes the deadline by which a source must implement a final BART determination.

18 AAC 50.260(o) requires the owner or operator of a source required to install control technology to maintain the equipment and conduct monitoring, recordkeeping, and reporting in accordance with the final BART determination.

18 AAC 50.260(p) explains the billing process for ADEC services under this section.

18 AAC 50.260(q) includes the definitions related to regional haze in the rules that are not in 18 AAC 50.990. These new regulations are consistent with the definitions and requirements for BART under the RHR. EPA proposes to approve these regulations.

2. BART-Eligible Sources in Alaska

In order to identify sources that could potentially be eligible for BART, ADEC conducted a preliminary review of its Title V permits. ADEC then worked in conjunction with WRAP's contractor, Eastern Research Group, Inc. (ERG), to identify BART- eligible sources from this preliminary source list. ERG's report of April 2005, found that the following seven sources were BART- eligible sources:

- Chugach Electric, Beluga River Power Plant (Chugach Electric);
- Alyeska Pipeline Service Company, Valdez Marine Terminal (Alyeska);
- Tesoro, Kenai Refinery (Tesoro);
- Anchorage Municipal Light and Power, George Sullivan Plant 2 (Anchorage Municipal);
- ConocoPhillips Alaska Inc., Kenai LNG Plant (CPAI);
- Agrium, Chemical-Urea Plant (Agrium); and
- Golden Valley Electric Association, Healy Power Plant (GVEA).

Chugach Electric was determined to not be BART-eligible due to the replacement of the BART-eligible emission units with ones that were not BART-eligible. In April 2007, ADEC sent a letter to Chugach officials regarding the status of its BART-eligible emission units. Chugach

responded with information that the BART-eligible emission units had been replaced and the plant had become a "steam electric plant" after the BART timeframe. EPA concurs with ADEC that Chugach Electric is not a BART-eligible source.

After identifying the BART-eligible sources, the second phase of the BART evaluation is to identify those BART-eligible sources that may reasonably be anticipated to cause or contribute to visibility impairment at any Class I area, *i.e.,* those sources that are 'subject' to BART. The BART Guidelines allow states to consider exempting some BART-eligible sources from further BART review because they may not reasonably be anticipated to cause or contribute to any visibility impairment in a Class I area. Consistent with the BART Guidelines and Alaska's regional haze regulations, ADEC provided BART source emission rates to WRAP, which conducted modeling to determine which BART-eligible sources could be reasonable anticipated to cause or contribute to visibility impairment in two Class I areas, Denali National Park and Tuxedni National Wildlife Refuge[8]. In WRAP's analyses, a 0.5 dv threshold was used to determine if a source was causing or contributing to visibility impairment in either of these two Class I areas.

Alaska also established a 0.5 dv threshold to determine if a BART-eligible source was subject to BART (see p. III.K.6-4 of the SIP submittal). This threshold was based on the following reasons:

1) Baseline visibilities at all Alaska IMPROVE sites are within 0.5 dv of the 2018 goal (See Table III.K.4-3 of the SIP submittal), and calculations conducted by ADEC demonstrate that the 2018 goal will be achieved in all Alaska Class I areas (see Alaska Regional Haze SIP submittal,

[8] Visibility impacts at Simeonof and the Bering Sea Wilderness Areas are expected to be below 0.5 dv.

III.K.9-33 through 9-40), except the Bering Sea Wilderness Area, for which there is no baseline data.

2) Insight into selecting a threshold was also gained from a review of the uncertainty observed in historical visibility measurements at each of the Class I area monitoring sites. Uncertainty values computed for each site (i.e., standard deviation) vary from 0.5 dv for Denali, to 0.8 dv at Simeonof, to 0.6 dv at Trapper Creek, to 1.0 dv at Tuxedni. A BART threshold of 0.5 dv would either be less than or equal to each of these visibility uncertainty values, thus visibility impacts of sources meeting this significance threshold would not be distinguished from historical variations observed at each of the monitoring sites.

Based on these reasons, Alaska selected the 0.5 dv threshold to determine which sources are subject to BART. Any source with an impact of greater than 0.5 dv in any Class I area, would be subject to a BART analysis and BART emission limitations. In the BART Guidelines, EPA recommended that States "consider the number of BART sources affecting the Class I areas at issue and the magnitude of the individual sources' impacts. In general, a larger number of BART sources causing impacts in a Class I area may warrant a lower contribution threshold." 70 FR 39104, 39161 July 6, 2005.

EPA reviewed the modeled impacts of the BART-eligible sources that Alaska decided were BART-exempt. These sources, Alyeska, Tesoro, Anchorage Municipal, Conoco-Phillips, and Agrium, were modeled to have a cumulative visibility impact of just over 1 dv on Tuxedni, and a 0.98 dv impact at Denali. See Table III.K.6-2 in SIP submittal. Given the number and location of sources and the cumulative impact from these sources, it is reasonable for Alaska to

conclude that a 0.5 dv threshold was appropriate for capturing those BART-eligible sources with significant impacts on visibility in Class I areas. For these reasons and in consideration of the facts specific to Alaska, EPA is proposing to approve the 0.5 dv threshold adopted by Alaska for determining which sources in Alaska are subject to BART.

To initially identify sources subject to BART, based on a 0.5 dv threshold, Alaska used the CALPUFF dispersion model results generated by WRAP. CALPUFF was used to assess the impact of emissions from BART-eligible sources on visibility at Denali and Tuxedni. CALPUFF used meteorological data forecast data, surface meteorological measurements, and major source specific emission estimates to calculate visibility impacts due to emissions of SO2, NOx and primary PM emissions. See Alaska Regional Haze SIP submittal Section III.K.6 for a summary of source specific modeling results and deciview impacts.

ADEC subsequently refined the CALPUFF modeling results by using a more accurate three-year meteorological data set, Additionally, the sources, ADEC, EPA, and the FLMs worked together to develop a more detailed CALMET modeling protocol along with the additional meteorological data. The results of this second dispersion modeling were compared to the 0.5 dv threshold to determine which sources were subject to BART. The modeling result for three of the six remaining BART-eligible sources (Alyeska Pipeline Service Company, Valdez Marine Terminal, Tesoro, Kenai Refinery and Anchorage Municipal Light & Power, Sullivan Plant) demonstrated that their visibility impacts were less than 0.5 dv. Therefore, Alaska determined that these three sources are not subject to BART.

The Agrium, Chem-Urea Plant is not currently operating and it is not known when it might reopen, and operating data necessary to conduct a BART analysis was not available. Agrium notified ADEC that it would be requesting the suspension of the renewal of its Title V permit as well as the termination of its current Title V permit for this facility. Given these conditions, ADEC issued a BART determination for Agrium which stated that Agrium has a zero emission limit for its BART eligible units, and must pursue a new air permit if and when it plans to restart this facility. Therefore, Agrium currently has a zero emission limit for its BART eligible units and that if this facility restarts operation, a new PSD air permit would be required that includes all units (including the BART units) at the facility. As a result, if this facility restarts operation, all BART-eligible units at the facility would be reclassified as PSD units and therefore would be subject to PSD emission limits. Therefore, ADEC has determined that this source is not subject to BART.

Alaska's review of the more refined CALPUFF modeling of the Conoco Phillips Alaska, Inc. (CPAI), Kenai LNG Plant found that its impact on the Tuxedni Class I area was greater than 0.5 dv. Subsequently, ADEC issued a Compliance Order by Consent (COBC) to the facility providing that after December 31, 2013, the emissions from the identified BART eligible units at the CPAI Kenai LNG Plant will be limited to a level that will not cause or contribute to visibility impairment in any Class I area at equal to or greater than 0.5 dv. The specific operating conditions, and allowable maximum daily NOx emission limits, required to remain below a 0.5 dv impact, are specified in Exhibit B of the COBC. ADEC has determined that this source is not subject to BART. EPA proposes to approve this determination.

EPA proposes to approve ADEC's determination that Alyeska Pipeline Service Company Valdez Marine Terminal; Tesoro, Kenai Refinery; Anchorage Municipal Light & Power, Sullivan Plant; the Agrium, Chem-Urea Plant, and the CPAI Kenai LNG Plant are not subject to BART.

3. BART-Subject Sources in Alaska

Modeling for the remaining BART eligible source, the GVEA Healy Power Plant Unit #1, demonstrated baseline visibility impacts of greater than 3.4 dv, and therefore is subject to BART. A summary of the modeling results and proposed actions to control emissions from this facility is summarized below.

ADEC determined that the Golden Valley Electric Association (GVEA), Healy coal fired power plant is a BART-eligible source located approximately 5 miles from Denali National Park. The BART-eligible units consist of one primary coal-fired boiler, a 25-MW Foster-Wheeler boiler, referred to as "Healy Unit #1", and one auxiliary boiler (Auxiliary Boiler #1). GVEA undertook a full assessment of control options for Healy Unit # 1 under 18 AAC 50.260(d)-(e) and used the WRAP modeling protocol and submitted its initial BART control analysis report on July 28, 2008. In this revised BART report, GVEA concluded that the existing NOx, SO2, and PM limits were BART for Healy Unit #1.

Subsequently, ADEC through its contractor Enviroplan, conducted a thorough BART analysis following the steps outlined in the BART Guidelines. Followings ADEC's consultation

with the FLM and receipt and review of public comments, Enviroplan completed a final BART determination report for GVEA on January 19, 2010, and revised this report on June 1, 2010. See Alaska Regional Haze SIP submittal, Appendix III.6-62 through 6-179. (Final Enviroplan BART Determination Report for GVEA, revised June 1, 2010 ("Enviroplan GVEA Healy BART Report")). This report, based on updated site-specific cost information on control technologies, and on the assumption that the useful life of installed control technologies would be 8 years (based on installation by 2016 and plant shutdown in 2024), concluded that the following control technologies are BART for Healy Unit #1: 1) Selective Non Catalytic Reduction (SNCR) added to the existing Low NOx Burners (LNB) with Over Fired Air (OFA) for NOx, 2) the existing dry sodium bicarbonate dry sorbent injection (DSI) system for SO2, and 3) the existing reverse-gas baghouse system for PM10

The Enviroplan GVEA Healy BART Report concluded that SNCR was BART for NOx because it would be cost effective at $4,208/ton (based on a 2024 closure of Healy Unit #1), and because SNCR would provide an 0.62 deciview improvement in visibility at the Denali Class I area for 51 days per year (a reduction from 3.36 dv impact to a 2.74 dv impact). The State determined that Selective Catalytic Reduction (SCR) was not cost effective at $15,762/ton and was therefore was rejected as BART for NOx control for this unit. Enviroplan also concluded that Rotating Over Fire Air (ROFA®), even though cost effective, would not be incrementally cost effective over SNCR because the cost per deciview improvement for the ROFA® equivalent emission limit would be 50 percent higher than the cost for the SNCR limit (for a visibility improvement of only 0.05 dv), and the capital cost of installing ROFA® would be 180 percent higher than installing SNCR.

For SO2 controls, Enviroplan indicated that increased sorbent injection, with a potential visibility improvement of 0.25 dv, was the only cost-effective option that could improve visibility in Denali National Park. However, after evaluating this alternative according to the required BART criteria, Enviroplan concluded that this option was cost prohibitive because it would cost $3,578 for each ton of SO2 removed and would result in a visibility improvement of only 0.25 dv. Enviroplan also noted that increasing the sorbent injection rate, could potentially cause a visibility impairing "brown plume" effect (due to the oxidation of nitrogen oxide (NO) to nitrogen dioxide (NO2) prior to discharge from the stack), which would adversely impact visibility in Denali National Park.

Based on the results of Enviroplan's evaluation, and in response to public comments received on the proposed BART for Healy Unit #1, ADEC determined that the BART emission limits for GVEA Healy Unit #1, based on a 2024 shutdown, are 0.20 lb/mmBtu for NOx, the current limit of 0.30 lb/mmBtu for SO2, and the current limit of 0.015 lb/mmBtu for PM.

The BART Guidelines provide that a source's remaining useful life may be considered as an element of the cost analysis in a BART determination for a particular source and recognizes that if the remaining useful life represents a relatively short time frame it may affect the annualized costs of the retrofit controls. BART Guidelines IV.D.4.k.1. As explained in the BART Guidelines, where the facility will be shut down earlier than its normal expected life, the remaining useful life is the difference between the date the controls are put in place and the date the facility permanently ceases operations. The BART Guidelines further provide that "Where

this date affects the BART determination this date should be assured by a federally, or State-enforceable restriction preventing further operation." BART Guidelines, IV.D.4.k.2.(2). In the case of the Healy Unit #1, EPA recognizes that the 2024 shutdown date relied on in the cost effectiveness calculation described above is not enforceable. However, the BART Guidelines provide that the methods specified in EPA's Control Cost Manual used to calculate annualized costs should reflect the specified time period for amortization that varies depending on the type of control. Therefore, based on our review, EPA considers 15 years to be a reasonable estimated remaining useful lifetime for the particular control technologies under consideration for NOx or SO2 control technologies for Healy Unit #1.

Based on a 15- year lifetime, EPA found that SCR was not cost effective for controlling NOx emissions at $10,170/ton. This cost effectiveness value does not include the cost to replace lost electricity generation during installation of SCR because there is insufficient evidence that the cost is a necessary consequence of SCR installation. When this element is removed from the cost estimate, the overall cost effectiveness over a 15-year lifetime for SCR decreases from $11,765/ton to $10,170/ton (see EPA's Healy BART Report- addendum). EPA finds that SCR is still not cost effective at this lower rate. However, the following NOx control technologies were considered cost effective: SNCR at $3,125/ton, ROFA at $3,476/ton, and ROFA® with Rotamix® at $4,325/ton.

EPA next considered the environmental impacts of each of these cost effective technologies. ROFA® with Rotamix® when operated to achieve the quoted NOx emission rate of 0.11 lb/MMbtu, reportedly carries some risk of increased emissions of carbon monoxide

(CO), carbon dioxide (CO2), and "loss-on-ignition" (un-burnt carbon particulate matter). Increased particulate matter emissions could result in additional visibility impairment at the Denali Class I area. However, EPA found that data quantifying this risk is not readily available, since facilities employing ROFA® with Rotamix® are typically allowed slightly higher NOx emission limits than those quoted by the vendors of these technologies. EPA's review did not identify a facility utilizing ROFA® with Rotamix® that was subject to an emission limit near 0.11 lb/mmBTU, the level quoted by the vendor for ROFA® with Rotamix® for Healy Unit #1. Installation of the ROFA® technology alone (without Rotamix®) is cost effective, and could achieve an emission rate of 0.15 lb/mmBtu according to the vendor quote, but would only result in a visibility improvement of approximately 0.05 dv beyond the improvement achievable using SNCR. ADEC considered this incremental visibility improvement not significant enough to warrant the increased cost for ROFA®, and EPA agrees with this decision.

ADEC selected the BART NOx emission limit for Healy Unit #1 based on a consideration of the BART five-step control review process, information provided by GVEA in their BART analyses, the Enviroplan GVEA Healy BART Report, and a decision by ADEC to grant GVEA's request to allow for some operational variability in the NOx emission rate for Healy Unit #1. GVEA conducted an analysis of 2003-2008 (5 years) 30-day rolling NOx and SO2 emissions from Healy Unit #1, applied three standard deviations to the mean of these values, and requested that their BART emission limits reflect the resultant rates at three standard deviations. In response, ADEC determined that an additional allowance of 5% higher than the emission rate identified in the findings report (0.19 lb/mmBtu) would sufficiently allow for operating variability. Specifically, ADEC determined that the flexibility provided by a 0.20

lbs/mmBtu NOx emission limit instead of a 0.19 lb/mmBtu NOx emission limit would require GVEA to stay within the specified emission limit, while allowing for a reasonable amount of operational variability. See Appendix III.K.6-114 of the SIP submittal. EPA believes that this minor NOx emission allowance would not significantly change the visibility impairment at Denali National Park due to emissions from Healy Unit #1. Therefore, EPA proposes to approve the State's determination that an emission limit of 0.20 lbs/mmBtu for NOx is BART for Healy Unit #1.

For SO2, EPA found that optimizing the existing Dry Sorbent Injection (DSI) system to achieve an emission limit of 0.18 lb/mmBtu, by increasing the sorbent injection rate, is cost effective at $3,578/ton. . However, increased sorbent injection rate carries the risk of a "brown plume" effect. Brown plume refers to the oxidation of nitrogen oxide (NO) to nitrogen dioxide (NO2) prior to discharge from the stack. NO2 is brown in color, while NO is colorless; the two together form NOx. Combustion emissions are initially NO, and oxidize in the atmosphere to NO2. High sorbent injection rates can increase the potential for this oxidation to occur prior to discharge, potentially resulting in a visible brown plume from the exhaust stack. Due to the proximity of Healy Unit #1 to Denali National Park, a brown plume may result in increased visibility impairment in the sections of the Park closest to Healy Unit #1, even though overall visibility impairment would be reduced. Two other SO2 control options, a spray dryer, and wet limestone flue gas desulfurization, were considered not to be cost effective at $7,198/ton and $7,763/ton, respectively. Therefore, EPA proposes to approve the SO2 emission limit achievable by the current DSI control technology, 0.30 lb/mmBtu, as BART for Healy Unit #1.

ADEC determined that the existing reverse-gas baghouse system is the state-of-the-art particulate emissions (PM) control technology for utility boiler applications, and therefore, the existing high-efficiency reverse-gas baghouse installed on the Healy Unit #1 is BART for PM. EPA proposes to approve the PM emission limit achievable by the current reverse-gas baghouse control technology, 0.015 lb/mmBtu, as BART for Healy Unit #1.

Regarding the Auxiliary Boiler#1, the State indicated that this unit is just used during shutdown periods or emergency repairs to Healy Unit #1 to supply heat to the Healy 1 building or to provide steam and potable hot water to Healy Unit #2, if needed, when Healy Unit #1 is not operating and that it is fired monthly for maintenance checks. Additionally, refined modeling for the State also indicated that that the predicted visibility impacts attributable to the boiler were less than .067 dv. The State determined that the existing uncontrolled configuration and current Title 5 permit limits for the Auxilliary Boiler #1 were BART, and that no additional controls were required. See Enviroplan GVEA Healy BART Report Table E-1 for BART emission limits specific to the Auxiliary Boiler#1. EPA agrees that given the low annual emissions for the boiler, add-on pollution controls equipment for NOx and PM are not cost effective. EPA found that the only viable method to control SO2 emission from the Auxiliary Boiler #1 would be to switch to ultra-low sulfur diesel. However, due to the cost differential between high sulfur diesel and ultra-low sulfur diesel in the Fairbanks area, it would cost approximately $28,000/t on to reduce SO2 emission from the Auxiliary boiler#1 by switching fuels. Based on this cost, EPA has determined that this approach would not be cost effective. EPA proposes to approve the State's BART determination for the Auxiliary Boiler #1.

F. Determination of Reasonable Progress Goals

The RHR requires States to show "reasonable progress" toward natural visibility conditions over the time period of the SIP, with 2018 as the first milestone year. The RHR at 40 CFR 51.308(d)(1)requires states to establish a goal, expressed in deciviews, for each Class I area within the state that provides for reasonable progress toward achieving natural visibility conditions by 2064. As such, the State must establish a Reasonable Progress Goal (RPG) for each Class I area that provides for visibility improvement for the most-impaired (20% worst) days and ensures no degradation in visibility for the least-impaired (20% best) days in 2018. RPGs are estimates of the progress to be achieved by 2018 through implementation of the Long Term Strategy (LTS), which includes anticipated emission reductions from all State and Federal regulatory requirements implemented between the baseline and 2018, including but not limited to BART and any additional controls for non-BART sources or emission activities including any Federal requirements that reduce visibility impairing pollutants.

As explained above, ADEC relied on the WEP analysis conducted by the WRAP to project visibility conditions at Denali National Park, Simeonof Wilderness Area, and Tuxedni National Wildlife Area in 2018. The visibility projections were based on estimates of emissions reductions from all existing and known controls resulting from Federal and state CAA programs as of December 2010.

In setting the RPGs for its Class I areas, ADEC considered a number of different factors. These factors included: 1) attainment of the URP in each Class I area by 2018, 2) results of the Four Factor Analysis, 3) additional improvements in visibility due to BART controls, 4) evidence that there is significant contribution to visibility impairment from international sources (such as Asian Dust, and Arctic Haze) and substantial contributions from natural sources (such as wildfires and sea salt), and 5) additional improvements in visibility in Alaskan Class I areas due to new maritime emission regulations that will achieve substantial reductions by 2015 in SO2 and NOx emissions from commercial marine vessels. These five factors are further described in the following paragraphs.

1) Attainment of the 2018 URPs - ADEC conducted a statistical analysis of historical visibility data from the Denali, Tuxedni, and Simeonof Class I areas to demonstrate that the visibility in the Class I areas in Alaska in 2018 projected by the WEP analysis falls within the bounds of the 2018 URP glide path, with a 95% degree of confidence. This indicates that there is no difference between the WEP forecast of visibility impairment in the Class I areas, and the URP determined for each Class I area in 2018.

2) Results of the Four Factor Analysis –As described in section II.D. above, when establishing RPGs the RHR requires the states to consider (1) the costs of compliance; (2) the time necessary for compliance; (3) the energy and non-air quality environmental impacts of compliance; and (4) the remaining useful life of any potentially affected sources. 40 CFR 51.308(d)(1)(i)(A). This is referred to as the Four Factor Analysis. As reflected in the information presented in Table III.K.9-2 of the SIP submittal, the WEP

analysis indicates that three categories of point sources may be significant contributors to regional haze and warrant further analysis under the four factors. These three categories are: industrial boilers, petroleum refineries, and reciprocating engines and turbines. Based on the four-factor analyses of these three source categories, ADEC concluded that it is not reasonable to require additional controls for these source categories at this time. Alaska explained its reasons to support this decision include: 1) the Class I areas in Alaska do not need large visibility improvements to reach natural conditions in 2064, 2) the Class I areas are predicted to attain the URP in 2018, 3) emissions from natural sources (primarily wildfires) contribute the most significant visibility impacts, and 4) it is uncertain, at this time, how much visibility improvements could be attained by controlling individual point sources, since each contributing point source has not been individually modeled for visibility impact to the nearest Class I area.

3) Additional Improvements not included in the WEP Analysis - Additional improvements at several sources that were not factored into ADEC's WEP analysis reduce visibility impairing pollutants impacting Denali, and Tuxedni, within the next 5 years. GVEA's Healy Power Plant Unit #1 will install SNCR as BART for NOx, which will reduce NOx impacts at Denali by 0.62 dv. The Conoco Philips Kenai LNG plant will also reduce its emissions to below 0.5 dv under the conditions of a consent order. Finally, the Agrium, Chem-Urea Plant in the Kenai has stopped operating and therefore has dramatically reduced NH3, NOx and PM2.5 emissions impacting Tuxedni (by 98%, 18%, and 93%, respectively). These reductions in emissions from sources on the Kenai Peninsula

indicate that visibility at Tuxedni should improve even more rapidly than predicted by the WEP analysis.

4) Contribution from International Sources and Natural Sources – Significant contributions to haze in the Class I areas is Alaska include natural sources (biogenic aerosols, sea salt, volcanic emissions) and international sources. See generally, Alaska Regional Haze SIP submittal, III.K.3-4 to 3-8. There is also evidence that natural wildfire is a substantial contributor to visibility impairment in the three modeled Class I areas, but particularly in the Denali Class I area. The speciation analysis, clearly demonstrate that natural fires are the dominant source of pollutants impacting all Class I areas within Alaska on the 20% worst days. In Denali, natural fires contribute 97% of the PM2.5, 68% of the VOCs, 79% of the NOx, and 65% of the SO2 that cause visibility impairment in that Class I area. At Trapper Creek (also in Denali), natural fires contribute 86% of the PM2.5, 65% of the VOCs, 34% of the NOx, and 62% of the SO2 that cause visibility impairment. In Simeonof, natural fires contribute 99% of the PM2.5, 89% of the VOCs, 76% of the NOx, and 92% of the SO2 that cause visibility impairment on the worst 20% days. In Tuxedni, natural fires contribute 78% of the PM2.5, 41% of the VOCs, 15% of the NOx, and 44% of the SO2 that cause visibility impairment on the worst days. See generally Alaska Regional Haze SIP submittal, Section III.K.4, and WEP analyses shown in Tables III.K.7-1 through III.K.7-4.

5) Additional Improvements due to New Maritime Emission Regulations – Alaska also found that new emission control requirements on commercial marine vessels, which will

be fully in effect by 2015, will reduce SO2, NOx, and PM2.5 emission contributions to visibility impairment in Simeonof Wilderness Area and Tuxedni National Wildlife Refuge. In October 2008, the International Maritime Organization (IMO) adopted Annex VI amendments which specify (1) new fuel quality requirements for commercial marine vessels beginning from July 2010, (2) Tier II and III NOx emission standards for new commercial marine engines, and (3) Tier I NOx requirements for existing pre-2000 commercial marine engines. The Annex VI amendments designate waters within 200 miles of the North American coast (including Alaska) as an emission control area (ECA). The requirements of Annex VI ensure large reductions in particulate matter, NOx, and SO2 emission from commercial marine vessels operating in the ECA. These reductions were not factored into the Alaska 2018 emissions inventory projections or the WEP analysis, but are expected to further improve visibility at Tuxedni, and to a lesser extent Simeonof, which are both significantly impacted by emissions from commercial marine vessels.

Alaska acknowledged that its emission inventory and 2018 reasonable progress forecasts and emission inventory do not include emissions from the 50 MW coal-fired unit at the GVEA facility in Healy (Healy Unit #2) The State explained, the unit has not operated for a number of years, is not currently operating and that the available information to analyze the potential visibility impact of the Healy Unit #2 emissions on Denali is inconclusive. The State does recognize however that if the unit is brought on line, the point source NOx and SOx emissions emitted from within the Denali Borough would increase by a factor of 4.0 and 2.8 respectively. Alaska Regional Haze SIP submittal III.K.9-32, 9-37. EPA is aware that on February 3, 2012,

ADEC issued a revised Title 5 permit to GVEA allowing Healy 2 to resume operations, and that emissions from Healy 2 could have an impact on visibility in Denali. Final Air Quality Operating Permit No. AQ0173TVP02 (Feb. 3, 2012). However, since the visibility impacts of these future emissions have not yet been modeled, the exact amount of impact cannot be determined at this time. Therefore, for reasonable progress purposes, it is not reasonable to require additional controls on the facility at this time. If or when the unit begins operating again, ADEC commits to assessing the impact of these additional emissions on visibility in Denali and will evaluate control options for the facility as part of its 5 year progress report. In light of the uncertainty regarding the facility at this time, we propose to approve the State's consideration of the Healy Unit #2 in its reasonable progress evaluation. EPA will consider additional relevant information it receives during public comment period regarding the emissions or visibility impact of this source as it relates to Alaska's reasonable progress goals.

EPA is proposing to agree with the State's analysis and conclusion that it is not reasonable to seek additional controls on other emission sources within the State at this time to achieve further reasonable progress. Importantly, the RPGs for the Class I areas in Alaska are projected to meet the URP in 2018. Alaska has demonstrated that the RPGs provide for visibility improvement on the worst days, and no degradation of visibility on the best days compared to the baseline average. EPA finds that the State's decision not to seek additional control measures is supported by the fact that there is significant contribution to haze in the Class I areas due to international sources and some natural sources (biogenic aerosols, sea salt, and volcanic emissions), as well as substantial contributions to haze from wildfires. In addition, the State expects reductions in statewide emissions of SO2 and NOx due to BART emission limits on

Healy Unit #1, emission limits on the Conoco Phillips Kenai LNG Plant specified in the consent order between Alaska and Conoco Philips, and the shutdown of the Agrium, Chem-Urea Plant. Based on the above reasons, EPA is proposing to approve ADEC's demonstration that its RPGs provide for reasonable progress in all its Class I areas for the first planning period, as required in CFR 51.308(d)(1)(i), (ii) and (vi).

G. Long Term Strategy (LTS)

Alaska relied on monitoring, emission inventories and modeling information from the WRAP as the technical basis for its LTS. Coordination and consultation occurred with other states through the WRAP, in which all western states participated in developing the technical analysis upon which their SIPs are based. This included identifying all anthropogenic sources of visibility impairment including major and minor stationary sources, mobile sources, and area sources. The anticipated net effect on visibility over the first planning period due to changes in point, area, and mobile source emissions is a significant reduction in regional haze in the Denali, Tuxedni, and Simeonof Class I areas. In particular, ADEC considered the following factors in developing its long-term strategy.

1. Ongoing Air Pollution Control Programs

Alaska has a number of ongoing programs and regulations that directly protect visibility or provide for improved visibility by generally reducing emissions.

a. Prevention of Significant Deterioration/New Source Review Regulations

The two primary regulatory programs for addressing visibility impairment from industrial sources are the BART and Prevention of Significant Deterioration/New Source Review (PSD/NSR) rules. The PSD/NSR rules require that emissions from new industrial sources and major changes to existing sources protect visibility in Class I areas through attainment of air quality related values, including visibility, in Class I areas.

b. Regional Haze BART Controls

Section 51.308(e) of the RHR includes the requirements for states to implement Best Available Retrofit Technology for eligible sources within the State that may reasonably cause or contribute to any impairment of visibility in any mandatory Class I area. Alaska's BART regulations (18 AAC 50.260) specify how to determine if a source is subject to BART, and identify the process for determining BART emission limits for BART-subject sources. As discussed in section II.E. above, ADEC has completed analysis of identified BART-eligible sources in Alaska and has determined BART emission limits for all BART-subject sources. Each source subject to BART is required to install and operate BART as expeditiously as practicable, but in no case more than five year after EPA approval of the regional haze SIP.

c. Operating Permit Program and Minor Source Permit Program

ADEC implements a Title V operating permit program as well as a minor source permit program for stationary sources of air pollution. The Title V permits are consistent with the requirements of 40 CFR Part 71 and requirements are found in 18 AAC 50 Article 3, Major

Stationary Source Permits. The requirements for minor source permits are found in 18 AAC 50 Article 5, Minor Permits. These permit programs, coupled with PSD/NSR requirements, serve to ensure that stationary industrial sources in Alaska are controlled, monitored, and tracked to prevent deleterious effects of air pollution.

d. Alaska Open Burning Regulations

Alaska has previously established open burning regulations in 18 AAC 50.065. These regulations are intended to prevent particulate matter emitted from open burning from adversely impacting visibility in Class I areas. For example,18 AAC 50.065 (b)-(f) provide ADEC the authority to require pre- approvals for controlled burning to manage forest land, vegetative cover, fisheries, or wildlife habitat if the area to be burned exceeds 40 acres yearly. The open burning regulations, working in conjunction with the state's Enhanced Smoke Management Plan, control visibility impairing pollutants resulting from planned open burning activities.

e. Local, State and Federal Mobile Source Control Programs

Mobile source emissions show decreases in NOx, SO2, and VOCs in Alaska during the period 2002-2018. These declines in emissions are due to numerous rules already in place, most of which are federal regulations. The State of Alaska has established regulations related to mobile sources that primarily impact the Fairbanks and Anchorage CO maintenance areas, Alaska's two largest cities. These programs have resulted in NOx and hydrocarbon emission reductions from motor vehicles in Alaska's two largest communities.

f. The Federal Motor Vehicle Control Program and Federal Diesel Emission Standards

The Federal Motor Vehicle Control Program (FMVCP) is a federal certification program that requires all new cars sold in all states except California to meet more stringent emission standards. As a result, motor vehicle emissions will be reduced as the older vehicle fleet is replaced with newer cleaner vehicles. Additionally, a variety of federal rules establishing emission standards and fuel requirements for diesel on-road and non-road equipment will significantly reduce emissions of particulate matter, nitrogen oxides, and sulfur oxides from emission sources over the first planning period in Alaska. Alaska reports that as of 2010, all on-road and non-road diesel engines in Alaska have meet EPA's national requirements for 15 ppm sulfur diesel fuel. In addition to these regulatory programs, ADEC is also promoting voluntary projects to reduce diesel emission reductions throughout the state.

g. Implementation of Programs to Meet PM_{10} NAAQS

The community of Eagle River and the Mendenhall Valley in Juneau are either currently or formerly nonattainment areas with respect to the NAAQS for coarse particulate matter (PM10). These areas exceeded the standards due primarily to wood burning and road dust sources, and now have strict controls in place that regulate wood burning and control road dust, the two major sources of PM10 in these communities.

2. Measures to Mitigate Impacts of Construction Activities

In developing its LTS, ADEC has considered the impact of construction activities on visibility in the Class I areas. ADEC regulations at 18 AAC 50.045(d) require that entities who cause or permit bulk materials to be handled, transported, or stored or who engage in industrial activities or construction projects shall take reasonable precautions to prevent particulate matter from being emitted into the ambient air. This regulation allows the state to take action on fugitive dust emissions from construction activities. Based on the general knowledge of growth and construction activity in Alaska, ADEC believes that current state and federal regulations adequately address this emission source category.

3. Emission Limitations and Schedules for Compliance

Emission limits and compliance schedules for affected sources are specified under Alaska and federal regulations in accordance with the Clean Air Act. Additionally, as discussed above, Alaska has established specific emission limits and compliance schedules for sources subject to BART. The state anticipates future SIP updates may identify additional emission controls that could be implemented at that time and commits to include limits and compliance schedules as needed in future plan updates.

4. Source Retirement and Replacement Schedules

Alaska's continued implementation of NSR and PSD requirements, with the FLMs reviewing impacts to Class I areas, will assure that there is no degradation of visibility in Alaska

Class I areas on the least impaired days from expansion or growth of stationary sources in the state. ADEC will continue to track source retirement and replacement and include known schedules in periodic revisions to its Air Quality Control (ACC) Plan and Regional Haze SIP.

5. Smoke Management Techniques for Agricultural and Forestry Burning

Smoke from wildland fires is a major contributor to visibility impairment Class I areas in Alaska. Alaska found that implementation of effective smoke management techniques through regulation and an Enhanced Smoke Management Plan (ESMP) will mitigate impacts of planned burning on visibility in its Class I areas. Additionally, ADEC has developed and implemented an ESMP, and includes this plan as part of this long-term strategy. Specifically, the ESMP, which will be revised at least every 5 years or sooner if needed, outlines the process, practices and procedures to manage smoke from prescribed and other open burning to help ensure that prescribed fire (e.g. controlled burn) activities minimize smoke and air quality problems.

6. Enforceability of Emission Limitations and Control Measures

BART emission limits and control measures will enforceable as a matter of State law by virtue of Alaska's BART regulations at 18 AAC 50.260 and federally enforceable once approved as part of its State Implementation Plan. ADEC has adopted this Regional Haze Plan into the Alaska Air Quality Control Plan (Alaska's State Implementation Plan) at 18 AAC 50.030, which ensures that all elements in the plan are federally enforceable once approved by EPA.

EPA is proposing to find that ADEC adequately addressed the RHR requirements in its long-term strategy (LTS). EPA believes that this LTS provides sufficient measures to ensure that Alaska will meet its emission reduction obligations to achieve adequate visibility protection for the Class I areas in the State.

H. Monitoring Strategy and Other Implementation Plan Requirements

The primary monitoring network for regional haze in Alaska is the IMPROVE network. As discussed in section III.B. of this notice, there are currently two IMPROVE monitoring sites at Denali National Park, one at Simeonof, and one at Tuxedni. There is no IMPROVE site for the Bering Sea Wilderness Area. As previously explained, one of the monitoring challenges in Alaska is the logistical difficulty of monitoring at remote locations in the harsh arctic environment. The challenges for ongoing air and visibility monitoring in Alaska include transportation and site maintenance in isolated and remote areas where access may be intermittently available only by air or water, and electrical power may be lacking. Alaska is working with EPA and the FLMs to ensure that the monitoring network in Alaska provides data that are representative of visibility conditions in each affected Class I area within the State. In the SIP submittal, Alaska commits to rely on the IMPROVE network for complying with the regional haze monitoring requirement in EPA's RHR for the current and future regional haze implementation periods. See Alaska Regional Haze SIP submittal III.K.3.C.2.

I. Consultation with States and FLMs

Through the WRAP, member states and Tribes worked extensively with the FLMs from the U.S. Departments of the Interior and Agriculture to develop technical analyses that support the regional haze SIPs for the WRAP states. The State of Alaska provided an opportunity for FLM consultation, at least 60 days prior to holding any public hearing on the SIP. This SIP was submitted to the FLMs on June 24, 2010, for review and comment. Comments were received from the FLMs on August 23, 2010. As required by 40 CFR Section 51.308(i)(3), the FLM comments and State responses are included the SIP submittal.

40 CFR Sections 51.308(f-h) establish requirements and timeframes for states to submit periodic SIP revisions and progress reports that evaluate progress toward the reasonable progress goal for each Class I area. As required by 40 CFR Section 51.308(i)(4), ADEC will continue to coordinate and consult with the FLMs during the development of these future progress reports and plan revisions, as well as during the implementation of programs having the potential to contribute to visibility impairment in mandatory Class I areas. This consultation process shall provide on-going and timely opportunities to address the status of the control programs identified in this SIP, the development of future assessments of sources and impacts, and the development of additional control programs.

J. SIP Revisions and Five Year Progress Reports

Section 51.308(f) of the Regional Haze Rule requires that regional haze plans be revised and submitted to EPA by July 31, 2018, and every ten years thereafter. In accordance with those

requirements, ADEC commits to revising and submitting this Plan by July 31, 2018, and every ten years thereafter. See Alaska Regional Haze SIP submittal section III.K.10.

40 CFR 51.308(g) requires states to submit a progress report to EPA every five years evaluating progress towards the reasonable progress goal(s). The first progress report is due five years from the submittal of the initial implementation plan and must be in the form of an implementation plan revision that complies with 40 CFR Sections 51.102 and 51.103. ADEC commits to submitting a report on reasonable progress to EPA every five years following the initial submittal of the SIP. The reasonable progress report will evaluate the progress made towards the reasonable progress goal for each mandatory Class I area located within Alaska and in each mandatory Class I area located outside Alaska, which may be affected by emissions from Alaska.

IV. Amendment to Air Quality Control Plan Regarding Open Burning and Regional Haze

The Alaska Regional Haze SIP submittal included amendments to the Air Quality Control Plan at 18 AAC 50.30. More specifically, Volume II., Section III. F: Open Burning is revised to include the “In Situ Burning Guidelines for Alaska, Revision 1" (August 2008) and to update the open burn application requirements in Alaska’s Enhanced Smoke Management Plan. ADEC's "In Situ Burning Guidelines" apply to specified situations involving oil spills. Alaska's Enhanced Smoke Management Plan applies to prescribed burning and for land clearing approvals. Additionally, Volume II, Section III. K: Area Wide Pollution Control Program for Regional Haze is a new section and, as discussed above, is intended to meet the RHR

requirements, and Volume II: Appendices to Volume II is amended to include the Appendices for Alaska's Areawide Pollutant Control Program for Regional Haze.

EPA proposes to approve the amendments at 18 AAC 50.30.

V. What Action is EPA Proposing?

EPA is proposing to approve the Alaska Regional Haze plan, submitted on April 4, 2011, as meeting the requirements set forth in section 169A of the Act and in 40 CFR 51.308 regarding Regional Haze. EPA is also proposing to approve ADEC's BART regulations in 18 AAC 50.260. Additionally, EPA is proposing to approve the amendments to 18 AAC 50.30 to adopt by reference Volume II., Section III. F. Open Burning; Volume II, Section III. K. Area Wide Pollution Control Program for Regional Haze; and Volume II, Appendices to Volume II**.**

VI. Statutory and Executive Order Reviews

Under the Clean Air Act, the Administrator is required to approve a SIP submission that complies with the provisions of the Act and applicable Federal regulations. 42 U.S.C. 7410(k); 40 CFR 52.02(a). Thus, in reviewing SIP submissions, EPA's role is to approve state choices, provided that they meet the criteria of the Clean Air Act. Accordingly, this proposed action merely approves state law as meeting Federal requirements and does not impose additional requirements beyond those imposed by state law. For that reason, this proposed action:

- is not a "significant regulatory action" subject to review by the Office of Management and Budget under Executive Order 12866 (58 FR 51735, October 4, 1993);

- does not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);
- is certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq*.);
- does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Public Law 104-4);
- does not have Federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);
- is not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001);
- is not subject to requirements of Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the Clean Air Act; and
- does not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this rule does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian

country located in the state, and EPA notes that it will not impose substantial direct costs on tribal governments or preempt tribal law.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Intergovernmental relations, Nitrogen dioxide, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides, Visibility, and Volatile organic compounds.

Dated: February 14, 2012

Signed: Dennis J. McLerran
Regional Administrator
Region 10.

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