I. LEGISLATIVE FRAMEWORK AND FOREST SERVICE POLICY

A. FEDERAL AND STATE LAWS AND REGULATIONS

The regulation of air pollution sources is delegated by the Clean Air Act to the U.S. Environmental Protection Agency, and as applicable, to the states. However, the Forest Service has the responsibility to protect particular values of National Forest lands from the adverse impacts of activities inside and outside the forest boundary. The following sections describe applicable legislative acts, regulations, and standards, as well as the role of the Forest Service in implementing air quality programs.

1. FEDERAL CLEAN AIR ACT

Congress passed the Clean Air Act (CAA) in 1960 with major amendments to the Act in 1967, 1970, 1977, and 1990. The purpose of the CAA is to enhance the quality of the nation's air resources and to protect public health and welfare. The Environmental Protection Agency (EPA) holds the primary oversight in carrying out this law.

The CAA established National Ambient Air Quality Standards (NAAQS) and gave the states primary responsibility for air quality management. States carry out this responsibility through their preparation of a State Implementation Plan (SIP) which must be approved by the EPA. The SIP outlines how a state will achieve and maintain applicable federal and state standards. The states must involve the public and industries through hearings and opportunities to comment on the development of each state plan. Table 1 lists the current NAAQS that apply both federally and throughout the state of Colorado.

The CAA provides the legal and regulatory framework for protecting air resources on National Forest System lands. The act also requires that the Forest Service comply with all Federal, State, or local air control rules, regulations, and directives. The Forest Service must consult with the State in matters concerning Forest management activities that may impact prevention of significant deterioration of air quality, visibility, air quality maintenance plan requirements, and nonattainment requirements.

One of the goals of the CAA is to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, or historic value. Section 165 (d)(2)(B) of the CAA specifically states that the Federal Land Manager (FLM) has: "…an affirmative responsibility to protect the air quality related values (including visibility) of any such lands within a Class I area." In Region 2, the FLM role has been delegated to the Regional Forester. It is the responsibility of the FLM to consult with EPA in the statutory process required for the approval of a Prevention of Significant Deterioration (PSD) permit application for a major source (42 USC 7475 (d)(2)(B)).

Table 1 - Criteria Pollutants, Federal and State Standards, Major Sources and Impacts

(Adapted from U.S. EPA, http://www.epa.gov/air/criteria.html, accessed 4/7/08)

(Differences in theColorado Ambient Air Quality Standards (CAAQS) are included in **bold** text in the footnotes)

Pollutant	Primary Standard	Averaging Time	Secondary Standard	Sources and Impacts
Carbon Monoxide (CO)	9 ppm (10 mg/m^3)	8-hour[(1)]	None	Formed from incomplete combustion, mainly from on-road vehicles, and off-road engines and equipment. Other sources include industrial processes, residential wood burning, and natural sources such as forest fires. Highest ambient levels typically during colder months when pollution trapped near the ground beneath a layer of warm air ("Inversion"). Causes harmful health effects by reducing oxygen delivery to the body's organs and contributes to the formation of smog.
	35 ppm (40 mg/m^3)	1-hour[(1)]	None	
Lead (Pb)	1.5 µg/m^3	Quarterly Average[(2)]	Same as Primary	Found naturally in the environment and in manufactured products. Major sources have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metals processing is the major source of lead emissions to the air today.
	0.15 ug/m^3	Rolling 3-month average	Same as Primary	
Nitrogen Dioxide (NO_2)	0.053 ppm (100 µg/m^3)	Annual Mean	Same as Primary	NO_2 belongs to the family of nitrogen oxide gases, or NOx and forms when fuel is burned at high temperatures. Primary sources are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. NOx is one of the main ingredients involved in the formation of ground-level ozone. NOx reacts to form nitrate particles, acid aerosols, as well as NO2, all of which can cause respiratory problems. NOx also contributes to the formation of acid rain, contributes to nutrient overload that deteriorates water quality, and contributes to atmospheric particles that cause visibility impairment.
PM10[(3)]	150 µg/m^3	24-hour[(4)]	Same as Primary	Particulate Matter (PM) is a complex mixture of extremely small particles. "PM10" are 10 microns in diameter or smaller; "PM2.5" are 2.5 microns in diameter or small. PM may consist of acids, organic chemicals, metals, and soil or dust particles. PM can be emitted directly from sources such as construction sites, unpaved roads, fields, smokestacks, and forest fires, or forms when chemicals such as sulfur dioxides and nitrogen oxides react in the atmosphere after being emitted from power plants, industries, or automobiles. PM can pass through the throat and nose and enter the lungs causing serious health effects. PM2.5 is the major cause of reduced visibility (haze).
PM2.5	15.0 µg/m^3	Annual Mean[(5)]	Same as Primary	
	35 µg/m^3	24-hour[(6)]	Same as Primary	
Ozone (O_3)	0.075 ppm (2008 std)	8-hour[(7)]	Same as Primary	Ground-level ozone is formed when oxides of nitrogen (NOx) react with volatile organic compounds (VOCs) in the presence of sunlight. Major sources of VOC and NOx include industrial facilities, electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents. Sunlight and warm weather accelerate the reaction, which is why ozone is typically a summertime pollutant. At high concentrations, ground-level ozone can damage plant tissues and adversely impact plant growth and health. At higher concentrations, ozone can impact public health.
	0.08 ppm (1997 std)	8-hour[(8)]	Same as Primary	
Sulfur Dioxide (SO_2)	0.03 ppm	Annual Mean	-------	SO2 belongs to the family of sulfur oxide gases (SOx) which are formed when fuel containing sulfur, such as coal and oil, is burned, or when metals are extracted from ore. SO2 dissolves in water vapor to form acid, and interacts with other gases and particles in the air to form secondary products. Most SO2 comes from electric utilities, especially those that burn coal. SO2 reacts with other chemicals in the air to form tiny sulfate particles which are associated with increased respiratory symptoms and disease. Sulfate particles are the major cause of reduced visibility in many parts of the U.S., including our national parks. SO2 reacts with other substances in the air to form acid rain.
	0.14 ppm	24-hour[(1)]	-------	
	-------	3-hour[(1)(9)]	0.5 ppm (1300 µg/m^3)	

1. Not to be exceeded more than once per year.
2. **The CAAQS is a monthly standard.**
3. Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM10 standard in 2006 (effective December 17, 2006). **The CAAQS for annual PM_{10} is 50 ug/m^3.**
4. Not to be exceeded more than once per year on average over 3 years. **The CAAQS is a one-month average.**
5. The 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
6. The 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective Dec. 17, 2006).
7. The 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed the standard. Effective May 27, 2008.
8. The 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed the standard. The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
9. **The CAAQS is 700 ug/m^3.**

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

In 1971, under the authority of Section 109 of the CAA, the EPA adopted health-based standards (NAAQS) that limit the concentration of certain air pollutants, called *criteria pollutants*, throughout the United States (40 CFR 50) (see Table 1). The primary standards are designed to protect public health, including sensitive populations such as the elderly, children, or people with asthma. Secondary standards are designed to mitigate harmful effects to animals, vegetation, and buildings, and limit decreases in visibility. Individual States have the responsibility for air quality management and for meeting these air quality standards.

Forest Service Conformity under NAAQS: Under the Clean Air Act, any area that violates the NAAQS for any of the six criteria pollutants is designated as a *non-attainment area*. A *maintenance area* is a non-attainment area that has been re-designated to attainment status subject to submission and approval of a maintenance plan. If a state has a non-attainment or maintenance area, it must develop a SIP that describes how the state will achieve and maintain federal and state standards.

The conformity rule of the CAA pertains to specific projects that are proposed in a non-attainment or maintenance area. The rule states: "no department, agency, or instrumentality of the federal government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan…" (Sec. 176, 42 USC 7506).

As it pertains to the Forest Service, the rule requires that the agency demonstrate that its actions (or actions of those who occupy and use National Forest lands under Forest Service authorization) will not impede the SIP's to attain or maintain the ambient air quality standard. When applicable, activities on national forests that may require a review for conformity include: fuel treatments including prescribed fire and harvest activities; road, trail, or building construction; and land use and special use permit decisions such as ski or winter sports area, mining, oil and gas development and landfills.

Periodic review and revision of the NAAQS is required under the CAA. States must revise their SIP's to demonstrate attainment of new standards as they are developed.

PREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY (PSD)

The CAA includes provisions to mitigate deterioration of air quality in areas that already meet Federal standards. These provisions are known as the Prevention of Significant Deterioration (PSD) program (Sec. 160-169, 42 USC 7470 et seq., 40 CFR 51.166). The goals of the PSD program are to:

1. protect air quality in areas cleaner than required by the NAAQS
2. protect air quality in certain national parks and wilderness areas
3. ensure that economic growth in these areas is consistent with the preservation of the existing air resources.

The PSD provisions categorize every region in the country as Class I, II, or III with allowable levels of air quality deterioration for each class (Table 2). Class I areas were originally designated as national parks over 6,000 acres, national wilderness areas and national memorial parks over 5,000 acres, and international parks that were in existence as of August 7, 1977. The list of all Class I areas can be found in 40 CFR 81.406. All remaining lands (public and private) outside of those listed are Class II areas. Currently, there are no Class III designations in the nation. Any redesignation from a Class II to Class I area can only be accomplished by individual states. The NAAQS must be met in both Class I and Class II areas.

Table 2 - Maximum Allowable Increase in Concentrations over Baseline Concentration (ug/m3) (40 CFR 51.166)

Pollutant	Time Period	Class I	Class II	Class III
PM10	Annual Arithmetic Mean	4	17	34
	24-Hour Maximum	8	30	60
SO2	Annual Arithmetic Mean	2	20	40
	24-Hour Maximum	5	91	182
	3-Hour Maximum	25	512	700
NO2	Annual Arithmetic Mean	2.5	25	50

The PSD program requires that all new major sources of pollution must apply for a permit from the appropriate air regulatory agency before construction can begin. A major stationary source is defined as one which would emit 100 or 250 tons per year of a regulated pollutant depending upon the type of source. The role of the Forest Service in the PSD permitting process is to review an application for an air polluting activity, determine if the additional pollution will impact air quality related values (AQRVs) in Class I wilderness areas, and make recommendations to state and federal permitting agencies before a permit is issued. It also requires that the EPA and states (in their SIP's) consider recommendations of the FLM. Ultimately it is up to the state regulatory agency to grant or deny the permit.

To help determine any potential negative impacts of air pollution, it is important that the Forest Service conduct an inventory of AQRVs and collect monitoring data to assess human-caused change and/or model future impacts. Steps towards protecting AQRV's include:

1. determine what components should be protected
2. measure the existing conditions of those components
3. analyze whether pollution is impacting components
4. establish and maintain long term monitoring of components to identify and predict future impacts
5. establish and maintain a database for use in the air regulatory process.

Best Available Control Technology Review for New or Modified Pollutant Sources: One key part of an air permit application is the review of proposed air pollution control technology for each new or modified emission unit at a facility. Air quality regulations recognize that it is most cost effective to require pollution control upgrades at the time new sources are built or modified, thereby allowing plant owners to plan for these costs as part of the construction of a new plant or an overall plant upgrade.

In general, the review of air pollution control technology involves analyzing what types of control technologies are possible for each regulated pollutant from each emission unit at the facility. The best performing option is selected unless it is deemed to be too expensive or causes other adverse environmental impacts. This process of ensuring that the best available control technology (BACT) is applied to industrial sources reduces air emissions to the lowest possible amount and minimizes air pollution impacts.

VISIBILITY PROTECTION AND REGIONAL HAZE RULE

Regional haze is visibility impairment caused by cumulative air pollutant emissions from numerous sources over a wide geographic area. Through the 1977 amendments to the CAA, Congress set a national goal for visibility as "the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I federal areas which impairment results from manmade air pollution" (Sec. 169A, 42 USC 7491). The amendments required the EPA to promulgate regulations to help States develop emission limits, schedules of compliance and other measures as necessary to make reasonable progress toward meeting the national goal.

These regulations were promulgated in 1980 to address visibility impairment that is "reasonably attributable" to one or a small group of sources. The EPA deferred action on regional haze regulations until monitoring, modeling, and scientific knowledge about the relationship between pollutants and visibility effects improved. In 1999, EPA announced a major effort to improve air quality in national parks and wilderness areas. The Regional Haze Rule (40 CFR 51) calls for state and federal agencies to work together to improve visibility in 156 national parks and wilderness areas. The rule requires the states, in coordination with the EPA, the National Park Service, U.S. Fish and Wildlife Service, the U.S. Forest Service, and other interested parties, to develop and implement air quality protection plans to reduce pollution causing visibility impairment. The Colorado Air Quality Control Commission will conduct a hearing regarding the proposed State Regional Haze State Implementation Plan in December 2008.

The Forest Service and other agencies have been monitoring visibility in national parks and wilderness areas since 1988. A consistent methodology to monitor visibility in these Federal class I areas was developed, known as the Interagency Monitoring of Protected Visual Environments (IMPROVE).

2. COLORADO STATE CLEAN AIR ACT (CO. AIR QUALITY CONTROL ACT)

The Clean Air Act gives individual states primary responsibility for implementing air quality programs. The Colorado Air Quality Control Act outlines the State's responsibilities as required under the CAA. Though individual states may have air pollution laws more stringent than federal laws, they may not have weaker pollution limits than those set by EPA (40 CFR 52.14).

Colorado State has taken the citizen board approach as a means of regulating air quality. The board is made up of nine commissioners advised by the Department of Public Health and Environment. The commission was created by Article 7 of Title 25, C.R.S. to adopt an air

quality program for the state, assure that the state's program meets the requirements of the Federal CAA, and deal with the issuing of or denial of a PSD permit, permit conditions, and enforcement orders.

The Colorado Air Pollution Control Division tracks pollution sources, generates inventories to quantify emissions, and issues permits that allow entities to conduct operations with limits on emissions. Under its Organic Act authority (16 USC 551), the Forest Service may require stricter mitigation measures than those required by the states.

3. FOREST SERVICE ORGANIC ACT OF 1897

The basic authority to protect national forest lands was delegated to the Forest Service by the Organic Act of 1897. Unlike the national parks, which were created primarily to preserve natural beauty and unique outdoor recreation opportunities, the founders of early national forests envisioned them as working forests with multiple objectives. The Organic Administration Act of 1897, under which most national forests were established, states: "No national forest shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States…"

4. WILDERNESS ACT OF 1964

The Wilderness Act of 1964 (16 USC 1131) established a system of public land preserves. The Code of Federal Regulations under 36 CFR 293 provides the Forest Service the responsibility to manage wilderness areas to preserve and protect the wilderness character, and to restore as necessary the natural wilderness condition. The Wilderness Act and implementing regulations do not specifically address air pollution impacts; however, they do specify what should be protected ("the earth and its community of life") and the degree of protection ("preserve its natural condition").

5. NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

The National Environmental Policy Act (NEPA), as amended (42 USC 4321) established the EPA along with national environmental policies and goals to protect, maintain, and enhance the environment. NEPA requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet this requirement, federal agencies prepare a detailed statement known as an Environmental Impact Statement (EIS). EPA reviews and comments on EIS's prepared by other federal agencies, and maintains a national filing system for all EIS's.

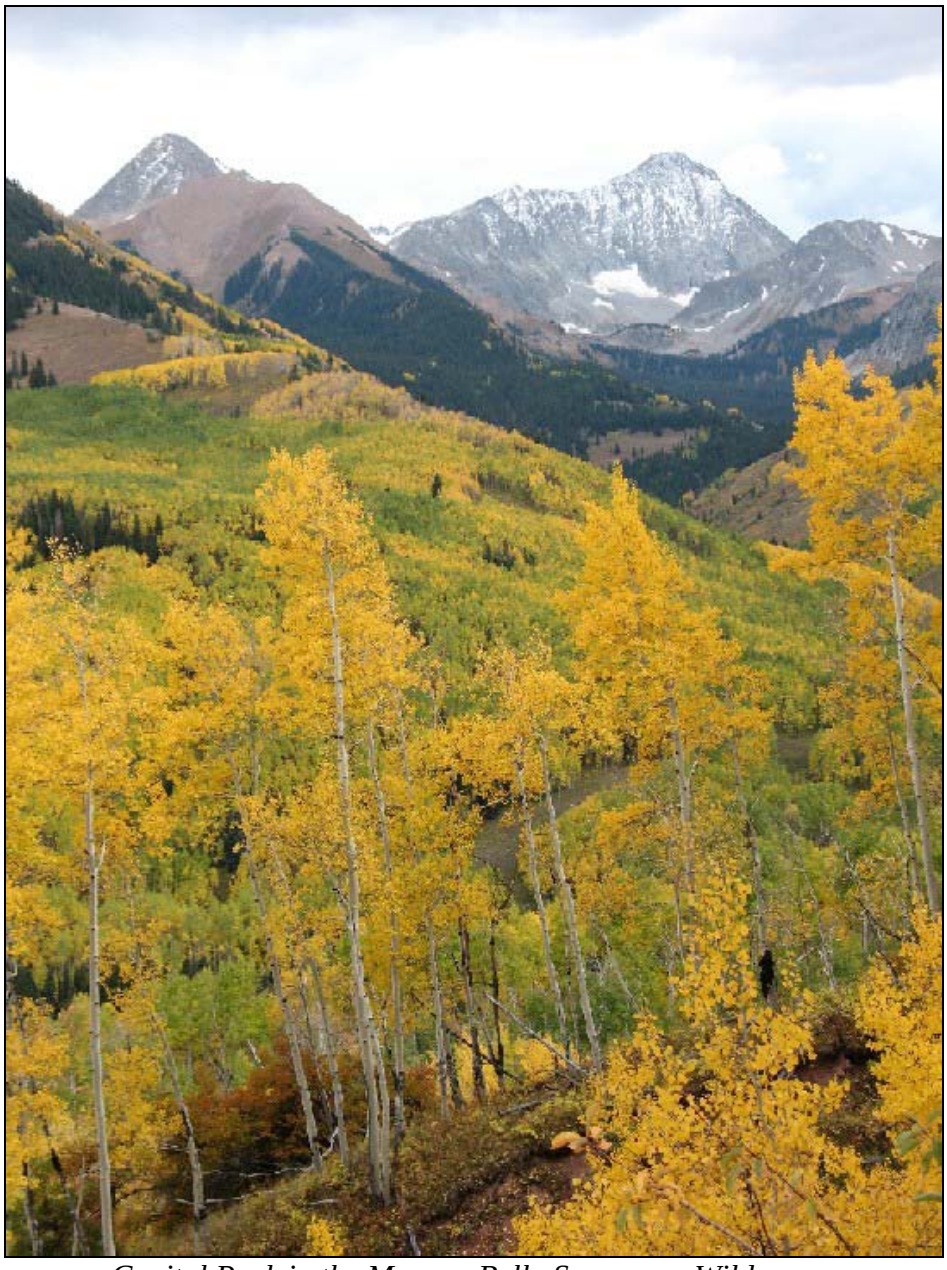
6. FOREST & RANGELAND RENEWABLE RESOURCES PLANNING ACT OF 1974

This basic authority to protect national forests was further enhanced by the Forest and Rangeland Renewable Resource Planning Act of 1974, as amended by the National Forest Management Act

(16 USC 1602) of 1976. This act directs the Forest Service to "…recognize the fundamental need to protect and, where appropriate, improve the quality of soil, water, and air resources…" (16 USC 1602(5)(C)).

7. MULTIPLE-USE SUSTAINED-YIELD ACT OF 1960

In the Multiple-Use Sustained-Yield Act of 1960 (16 USC 528), Congress established that the national forests shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes.



Capitol Peak in the Maroon Bells-Snowmass Wilderness

B. FOREST SERVICE POLICY

The overriding objective of the Forest Service management program is to ensure that national forests are managed in an ecologically sustainable manner. The national forests were originally envisioned as working forests with multiple objectives: to improve and protect the forest, to secure favorable watershed conditions, and to furnish a continuous supply of timber for the use of citizens of the United States. Forest management objectives have since expanded and evolved to include ecological restoration and protection, research and product development, fire hazard reduction, and the maintenance of healthy forests.

The role of the Forest Service in air quality management is to coordinate national forest activities with state and federal air quality control efforts. This is done by properly managing and/or mitigating the sources of air pollution created by Forest Service activities, such as prescribed fire, the construction and use of roads, and the operation of various facilities. The Forest Service establishes pollution impact monitoring efforts in wilderness areas to understand the condition of resources of concern, such as lichen or sensitive lakes. The Forest Service is dedicated to its stewardship role under the Organic Act and to its responsibility under the CAA's PSD provisions to protect and enhance AQRV's in designated Class I wilderness areas. Table 3 identifies AQRV's and general metrics that can be used to determine air quality impacts.

Table 3 - Air Quality Related Values (AQRVs)

AQRV	IMPACTS - CHANGES IN:
Visibility	Contrast, Visual Range, Coloration.
Water	pH, Total Alkalinity, Metal Concentration, Anion and Cation Concentrations.
Soil	Cation Exchange Capacity, Base Saturation, pH, Structure, Metals Concentration.
Flora and Fauna	Growth, Mortality, Reproduction, Diversity, Visible Injury, Succession, Productivity.
Cultural-Archaeological	Decomposition Rate and Paleontological
Odor	Odor

1. FOREST SERVICE MANUAL

The Forest Service policy for air resource management in wilderness is set forth in the Forest Service Manual (http://www.fs.fed.us/im/directives/).

Section 2300 (Recreation, Wilderness, and Related Resource Management) established general criteria for wilderness management under authority of the CAA. The objectives set forth in Section 2320.2 include direction to, "gather information and carry out research in a manner compatible with preserving the wilderness environment to increase understanding of wilderness ecology, wilderness uses, management opportunities, and visitor behavior."

Specific policies are outlined in Section 2323.6, Management of Air Resources:

a. Protect air quality and related values, including visibility, on wilderness land designated Class I by the Clean Air Act as amended in 1977.

b. Protect air quality in wilderness areas not qualifying as Class I under the same objectives as those for other National Forest System lands.

c. Define air quality related values (AQRV) and initiate action to protect those values.

d. For each air quality related value, select sensitive indicators, monitor, and establish the acceptable level of protection needed to prevent adverse impacts.

e. Determine the potential impacts of proposed facilities in coordination with State air quality management agencies. Make appropriate recommendations in the permitting process following established Prevention of Significant Deterioration application review procedures for major emission sources. Requests to air quality management agencies for consideration of Class II values in the permit process are appropriate.

f. Manage smoke from management ignited prescribed fires occurring in or adjacent to Class I wilderness areas in a manner that causes the least impact on air quality related values.

Forest Service Manual Section 2580 – Air Resource Management – provides further direction:

a. Cooperate with air regulatory authorities to prevent significant adverse effects of air pollutants and atmospheric deposition on forest and rangeland resources.

b. Integrate air resource management objectives into all resource planning and management activities.

c. Protect current condition of air quality related values within Class I areas.

d. Monitor the effects of air pollution and atmospheric deposition on forest resources.

2. CLASS II WILDERNESS - FOREST SERVICE POLICY

Wilderness areas established subsequent to the 1977 Amendments to the CAA are Class II air quality areas under the definitions in the Act. They are not subject to the same level of protection under the PSD permitting provisions of the CAA. However, management protection of the three Class I areas on the WRNF generally should protect air quality related values in the Forest's Class II wilderness areas. Air quality modeling on the WRNF often includes assessing impacts to Class II wilderness areas.

3. FLM AIR QUALITY RELATED VALUES WORKGROUP

The FLMs' AQRV Work Group (FLAG) was formed at the request of industry to FLM's to develop a consistent approach to evaluate air pollution effects on federally managed resources during the PSD process. FLAG members include representatives from agencies that manage Class I wilderness areas: the U.S. Department of Agriculture Forest Service (USDA/FS), the National Park Service (NPS), and the U.S. Fish and Wildlife Service (FWS).

The goals of FLAG have been to provide consistent policies and processes both for identifying air quality related values (AQRVs) and for evaluating the effects of air pollution on AQRVs, primarily those in federal Class I air quality areas, but in some instances, in Class II wilderness areas. The FLAG Phase I Report (December 2000) consolidates the results of the FLAG visibility, ozone, and deposition subgroups. The chapters prepared by these subgroups contain issue-specific technical and policy analyses, and recommendations for evaluating AQRVs (http://www.fs.fed.us/air/documents/flag.pdf). This document is currently under revision (see http://www.nature.nps.gov/air/Permits/flag/index.cfm for more information)

4. REVISED FOREST PLAN DIRECTION FOR WHITE RIVER NATIONAL FOREST

Air resource management is specifically addressed in the current Land and Resource Management Plan for the WRNF as follows:

GOAL 2 (MULTIPLE BENEFITS TO PEOPLE)

Objective 2, Strategy 2b.4 states:

Monitor visibility and wilderness lake chemistries to assure that over the life of the plan, air-quality-related values in all wilderness areas are protected and where necessary, improved.

Objective 2, Stategy 2c.17 states:

Over the life of the plan, minimize the amount and impact of air pollutants produced from land management activities.

STANDARDS AND GUIDELINES

The current Forest Plan's standards and guidelines for air resource management are as follows:

Standards

1. Meet state and federal air quality standards and comply with local, state, and federal air quality regulations and requirements either through original project design or through mitigation for such activities as prescribed fire, ski area development or expansion, mining, and oil and gas exploration and production.

2. Perform conformity determinations or apply appropriate mitigation to zero out pollutants in order to maintain conformity with the SIP for proposed activities that will contribute to air pollutants to Environmental Protection Agency (EPA) designated non-attainment and maintenance areas.

Guidelines

1. For water bodies in both Class 1 and Class 2 wilderness areas for which the acid neutralizing capacity (ANC) is greater than 25 micro-equivalents per liter, the limit of acceptable change (LAC) from human-caused air pollution is no more than 10 percent change in ANC. For those extremely sensitive water bodies in which the ANC is less than 25 micro-equivalents per liter, the LAC is no greater than one micro-equivalent per liter.

2. For plume visibility impairment in wilderness, the LAC is a 5 percent change in contrast. The LAC for haze visibility impairment in wilderness is a 0.5 percent change in deciview or 5 percent change in light extinction.

3. Minimize the impact of smoke for each wildland fire by identifying smoke-sensitive areas, using "best available control measures," monitoring smoke impacts, and following guidance in state smoke management plans.

4. Reduce the impacts to air quality and loss of energy resources by only allowing flaring of gas from oil wells during production testing of wells. Connection to a pipeline or reinjection will be required once production is established. Exceptions will be considered on a case-by-case basis.

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