Implementation of the Travel Management Rule
Gila National Forest

AIR QUALITY SPECIALIST REPORT

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Introduction

Air quality on Forest system lands is potentially affected by land management and development activities both on and off the forest. Air pollution can affect human health, reduce visibility, and contribute to acidic deposition in sensitive, high-elevation locations. This analysis reviews any potential affects for authorized motorized vehicle travel on the Gila National Forest to impact National and State Ambient Air Quality Standards (AAQS), to degrade air quality by more than any applicable Prevention of Significant Deterioration (PSD) increment, to affect Class I Wilderness areas, or to cause or contribute to visibility impairment beyond any existing conditions. Air pollutants related to travel management activities can include vehicle emissions and fine particulate matter created primarily by dust from vehicle travel over a dry and unpaved road surface. Local and regional air quality is discussed in the following sections as well as a discussion of potential impacts to health (i.e., violating standards) and regional visibility.

Existing Condition

Regulatory Setting

Air quality in New Mexico is governed by a series of federal, state and local laws. These laws are designed to ensure that air quality in the state are in compliance with the Clean Air Act of 1970. The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants, listed below in Table 1. Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m^3), and micrograms per cubic meter of air ($\mu g/m^3$). These standards (1) identify a chemical compound, (2) describe a time period for measurement, and (3) define a maximum concentration.

Table 1. National Ambient Air Quality Standards

National Ambient Air Quality Standards				
	Primary Standards		Secondary Standards	
Pollutant	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m^3)	8-hour	None	
	35 ppm (40 mg/m^3)	1-hour		
Lead	0.15 $\mu g/m^3$	Rolling 3-Month Average	Same as Primary	
	1.5 $\mu g/m^3$	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 $\mu g/m^3$)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10}) (particles < 10 microns in diameter)	150 $\mu g/m^3$	24-hour	Same as Primary	
Particulate Matter ($PM_{2.5}$) (particles < 2.5 microns in diameter)	15.0 $\mu g/m^3$	Annual (Arithmetic Mean)	Same as Primary	
	35 $\mu g/m^3$	24-hour	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour	Same as Primary	
	0.08 ppm (1997 std)	8-hour	Same as Primary	
	0.12 ppm	1-hour (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 $\mu g/m^3$)	3-hour
	0.14 ppm	24-hour		

Ambient air quality standards in New Mexico are found in New Mexico Administrative Code (NMAC) 20.2.3 and define the upper limit of a pollutant that can be present in outdoor air without harm to the public's health. They are designed to protect even the most sensitive individuals in nearby communities. These standards represent objectives that will preserve air resources within the state, while recognizing that at certain times, due to unusual meteorological conditions, these standards may be exceeded for short periods of time without the addition of specific pollutants into the atmosphere. Table 2 identifies the NM Ambient Air Quality Standards.

Table 2. New Mexico Ambient Air Quality Standards

New Mexico Ambient Air Quality Standards		
Pollutant	**Averaging Time**	**New Mexico Standard**
Total Suspended Particulates	24 hr	150 ug/m3
	7 day	110 ug/m3
	30 day	90 ug/m3
	Annual geometric mean	60 ug/m3
Carbon Monoxide (CO)	8 hr	8.7 ppm
	1 hr	13.1 ppm
Nitrogen Dioxide (NO_2)	24 hr	0.10 ppm
	Annual arithmetic average	0.05 ppm
Sulfur Dioxide (SO_2) >3.5 miles from Chino Mine in Hurley	24 hr	0.10 ppm
	Annual arithmetic average	0.02 ppm
Sulfur Dioxide(SO_2) <3.5 miles from Chino Mine in Hurley (not to be exceeded > 1/yr)	24 hr	0.5 ppm
	3 hr	0.50 ppm
	Annual arithmetic average	0.03 ppm
Hydrogen Sulfide	1 hr	0.090 ppm
Total Reduced Sulfur	½ hr	0.003 ppm

The Freeport-McMoRan Chino Copper Smelter in Grant County, near the Gila National Forest, is currently considered an SO_2 maintenance area. The maintenance area is defined as a 3.5 mile radius region around the smelter. The maintenance area also includes high elevation areas within an 8-mile radius. The state submitted a State Implementation Plan to the regional EPA headquarters in 1978 and a redesignation plan to the EPA in 2003. The redesignation plan (http://www.nmenv.state.nm.us/aqb/Control_Strat/sip/Grant_Text.pdf) was approved by the EPA in 2003. In 2008 the Hurley smelter stack was demolished, thus there are no further point source emissions tied to the Chino Copper Smelter. To date however, the NM Air Quality Bureau has not updated any requirements specific to this SO_2 maintenance area.

All areas of the Gila National Forest outside of the Gila Wilderness are considered Class II areas for air quality. Although additional pollutants are limited in Class II areas, they are less protected than Class I areas. In Class II areas, state and federal regulators set emission limits to meet or maintain the Federal criteria pollutant standards and State ambient air quality standards. These emission limits must be complied with to meet the requirements of the Clean Air Act. Class II areas usually experience ambient pollution levels that limit visibility for many days of the year. Despite this, the Air Quality Bureau of the New Mexico Environment Department has not designated any airsheds in or around the Gila National Forest as being in non-attainment of Ambient Air Quality Standards.

Gila Wilderness Areas (Hoadley, 2008)

The Gila Wilderness Area was in existence at the time of the passage of the Clean Air Act Amendments of 1977, and thus was designated as a Class I area and provided the highest level of protection from additional air pollution. The Aldo Leopold and Blue Range Wilderness areas were added to the Wilderness Preservation System in 1980 and are considered Class II areas for air quality because they were not designated until after 1977.

Air Quality Values at Risk

The Federal Land Managers Air Quality Values Related Workgroup identified in their 2000 (FLAG, 2000) report that the three areas of greatest concerns for air quality in Class I and II areas under their jurisdiction include 1) visibility impairment, 2) ozone effects on vegetation, and 3) effects of pollutant deposition. Air Quality Resource Values (AQRV) at risk from these threats includes flora, fauna, odor, water, soils, geologic features and cultural resources. For established Air Quality Related Values (Blankenship, 1990a), the Gila Wilderness` Area Class I airshed is certified for visibility impairment due to regional haze.

Pollution Sources

Prevailing winds on the Gila National Forest are generally from the southwest though they may shift to easterly during the summer monsoon. Primary pollution sources are therefore most likely located in Southeast Arizona, Southwest New Mexico and extreme West Texas. Pollutants are also likely being transported across the border from Mexico. Table 1 shows the sources contributing the largest emissions in the vicinity of the three wilderness areas in 1999 (EPA, http://www.epa.gov/air/data/geosel.html). Some of the large smelters in this area have gone out of operation since 1999; however, the Asarco plant in El Paso has recently been granted approval for a renewal of their air quality permit from the state of Texas and may soon return to operation.

Table 3. Emissions in Tons per year from sources in Greenlee, Graham, and Cochise counties in Arizona; Catron, Grant,Hidalgo, Luna, and Dona Ana counties in New Mexico and El Paso and Hudspeth counties in Texas (1999 data).

CO	NOx	VOC	SO2	PM2.5	PM10	NH3	Facility	County	State	Industry
1,720	146	22.9	46.3	121	125		Phelps Dodge El Paso Operations	El Paso Co	TX	3331 - Primary Copper
853	1,067		2.5	25.4	25.4	13.7	Rio Grande Generating Station	Dona Ana Co	NM	4911 - Electric Services
	2,650						Deming Comp Sta	Luna Co	NM	4922 - Natural Gas Transmission
493	6,636	59.7	5,969	718	1,268	3.89	Az Electric Power Cooperative Inc	Cochise Co	AZ	4911 - Electric Services
488	2,628	30.4	7	66.1	66.1	36	El Paso Electric Co	El Paso Co	TX	4911 - Electric Services
	888						Florida Comp Sta	Luna Co	NM	4922 - Natural Gas Transmission
392	632	395	369	105	117		Chevron Usa Products Co	El Paso Co	TX	2911 - Petroleum Refining
	612						Afton Comp Sta	Dona Ana Co	NM	4922 - Natural Gas Transmission
273		264	10.3	1.35	1.92	7.68	White Sands Test Facility	Dona Ana Co	NM	9661 - Space Research And Technology
266	1,088	587	0.84	971	1,826		Phelps Dodge Corporation	Greenlee Co	AZ	1021 - Copper Ores
179	90.3		0.19	7.95	9.88		Border Steel Inc	El Paso Co	TX	3312 - Blast Furnaces And Steel Mills
130	584	377	69.9	98.3	110		Chevron Usa Inc	El Paso Co	TX	2911 - Petroleum Refining
128	358		747	54.1	104	0.1	Chemical Line Company - Douglas Facility	Cochise Co	AZ	3274 - Lime
	144		0.1	2.4	2.4		Wilcox Compressor Station	Cochise Co	AZ	4922 - Natural Gas Transmission
91.1	113		0.2	13	13		El Paso Electric Co	El Paso Co	TX	4911 - Electric Services
60.8	279	9.9	48.6	4.46	4.73		White Sands Missile Range	Dona Ana Co	NM	9711 - National Security
59	272	50.9	2.38	49.8	62.4		Physical Plant Boilers	Dona Ana Co	NM	4911 - Electric Services
45.7	284		0.21				El Paso Natural Gas Co	Hudspeth Co	TX	4922 - Natural Gas Transmission
32.8	39.1		403	26.8	37.5		Asarco Incorporated	El Paso Co	TX	3331 - Primary Copper
30.7	106		18,632	390	524	0.21	Hidalgo Smelter	Hidalgo Co	NM	3331 - Primary Copper
26.2	236		16,068	276	392		Chino Mines	Grant Co	NM	3331 - Primary Copper
15.4	154						El Paso Natural Gas Co	El Paso Co	TX	4922 - Natural Gas Transmission
9.16	680						Lordsburg Comp Sta	Hidalgo Co	NM	4922 - Natural Gas Transmission

Visibility

In 1985 the EPA initiated a network of monitoring stations to measure impacts to visibility in Class 1 Wilderness Areas. The Gila Wilderness was added to the Interagency Monitoring for Protection of Visual Environments (IMPROVE) network on April 6, 1994. This site is located near the Gila Cliff Dwellings National Monument and Monument is considered representative of all three wilderness areas (see Figures 1 and 2). Data are currently available on the Visibility Information Exchange Web Site (VIEWS, http://vista.cira.colostate.edu/views/) through 2005.

Figure 1. Gila Wilderness Areas

Figure 2. Location of IMPROVE site.

Visibility impairment in this area is a result of Regional Haze which is caused by the accumulation of pollutants from multiple sources in a region. Emissions from industrial and natural sources may undergo chemical changes in the atmosphere to form particles of a size which scatter or absorb light and result in reductions in visibility.

Smoke from wildland fire is a large contributor to increased visibility reduction on the worst days monitored in the area. In the early summer months, when wildland fire peaks in this area, the contribution of Organic Carbon (shown in green), which is likely attributed to wildland fires, is dominant. The greatest contributor to visibility reduction when fires are not prevalent is ammonium sulfate, which is formed from SO_2 emissions from industrial sources.

Relative to other parts of the country the Gila Wilderness Area has some of the least impacted visibility observed even on the worst days. Visibility in the eastern states is generally more limited due to the presence of higher concentrations of water vapor. Visibility impact due to Organic Carbon in this region is primarily from wildfires. In 2004, the Gila showed more impact than surrounding areas but less than either the east or west coast on the worst days.

Ozone

Ozone is considered a secondary pollutant because it forms on warm sunny days when the primary pollutants nitrogen oxide (NOx) and volatile organic compounds (VOC) are present. In addition to its impact on plant and human health, ozone also contributes to Regional Haze and its subsequent visibility impairment. While other air pollutants may negatively affect vegetation, ozone is recognized as the one most likely to cause damage. Visible damage due to cells may be present in the form of spots or dead areas. Decreased growth or altered carbon allocation may also occur. Ponderosa Pine is one species which is known to be sensitive to ozone in the atmosphere (FLAG, 2000).

Ozone monitors in the Southwestern United States in 2006 indicate that while high concentrations are not generally present in this area, the cumulative impacts are in the moderate range and may be having some impact on ozone sensitive species such as Ponderosa pine.

Deposition

Deposition of acidic pollutants through precipitation can result in acidification of water and soil resources in areas far removed from the source of the pollution. Work is ongoing to determine the sensitivity and critical loads that will cause impacts in some areas. A study in the 1980s found that based on the geology, soils and existing water chemistry the Gila Wilderness had sufficient acid neutralizing capacity to merit a low sensitivity ranking with respect to acid deposition (Blankenship, 1989).

A wet deposition monitor is maintained by the New Mexico Environment Department at the Gila Cliff Dwellings National Monument. Data are available from the National Acid Deposition website: http://nadp.sws.uiuc.edu/sites/siteinfo.asp?id=NM01&net=NTN
Trend plots for SO_4 and NO_3 from the National Acid Deposition site indicate a decrease over the past few years.

Smoke Management

The Gila National Forest has a Memorandum of Understanding (MOU) with the New Mexico Environmental Department Air Quality Bureau to follow the New Mexico Smoke Management Program (State of New Mexico, 2004). The Smoke Management Program was developed to protect the health and welfare of New Mexicans from the impacts of smoke from all sources of fire, and to meet the requirements of the federal Regional Haze Rule. The objective of the MOU between NMED and the Forest is to ensure that the Forest has, and would use, all the tools and information necessary to manage impacts from smoke. Particulate monitors would be used to measure smoke concentrations. However, even when heavy smoke blankets airsheds in and around the Forest, monitoring indicates that National Ambient Air Quality Standards have not been exceeded.

Airsheds
The Gila National Forest occupies portions of four designated airsheds in New Mexico. Table 4 outlines the number of Gila National Forest acres within each airshed.

Airshed	Total Acres in Airshed	GNF Acres within Airshed	% of Forest in Airshed	% of Airshed Occupied by GNF
Lower Rio Grande	3,613,983	290,744	9%	8%
Western Closed	1,997,830	137,191	4%	7%
South-Western Closed	3,999,237	219,672	6%	5%
Lower Colorado River	8,679,673	2,744,899	81%	32%

Table 4. Gila National Forest acres within NM airsheds

In general, air quality conditions on the Gila National Forest, including the three Wilderness areas are very good and there are no violations of the National Ambient Air Quality Standards. While there is room for improvement, visibility in this area is some of the least impaired in the nation. Primary contributors to visibility reduction include Organic Carbon associated with wildland fire and sulfates from industrial sources such as copper smelting and electric power generation. While there is some indication of elevated Ozone levels, they rarely exceed levels which have been determined to be harmful to vegetation. A cumulative effects index indicates moderate conditions but values are lower than in neighboring areas. Deposition monitoring indicates a decreasing trend in some of the more harmful pollutants. This is likely a result of reduced activity in the copper smelting industry.

Climate Change
The U.S. Environmental Protection Agency (EPA) has asserted that scientists know with virtual certainty that human activities are changing the composition of the Earth's atmosphere. It is also documented that "greenhouse" gases, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and hydrofluorocarbons have been increasing (EPA, 2010). The atmospheric buildup of these gases is largely the result of human activities such as the burning of fossil fuels. Greenhouse gases absorb infrared energy that would otherwise be reflected from the earth. As the infrared energy is absorbed, the air surrounding the earth is heated (CARB, 2007).

The Southwestern Region of the Forest Service recently released "Southwestern Region Climate Change – Trends and Forest Planning May 2010. The following information is summarized from excerpts of this publication:

> "In the Southwest, climate modelers agree there is a drying trend that will continue well into the latter part of 21^{st} century (IPCC 2007; Seager et al. 2007). The modelers predict increased precipitation, but believe that the overall balance between precipitation and evaporation would still likely result in an overall decrease in available moisture. Regional drying and warming trends have occurred twice during the 20^{th} century (1930s Dust Bowl, and the 1950s Southwest Drought). The current drought conditions "may very well become the new climatology of the American Southwest within a time frame of years to decades". According to recent modeling,

> the slight warming trend observed in the last 100 years in the Southwest may continue into the next century, with the greatest warming to occur during winter. These climate models depict temperatures rising approximately 5 to 8 degrees Fahrenheit by the end of the century (IPCC, 2007). This trend would increase pressures on the region's already limited water supplies, as well as increase energy demand, alter fire regimes and ecosystems, create risks for human health, and affect agriculture (Sprigg, 2000).
>
> Average air temperatures are rising, and it is likely that continued warming will accentuate the temperature difference between the Southwest and the tropical Pacific Ocean, enhancing the strength of the westerly winds that carry moist air from the tropics into the Southwest during the monsoon. This scenario may increase the monsoon's intensity, or its duration, or both, in which case floods will occur with greater frequency (Guido, 2008). While the region is expected to dry out, it is likely to see larger, more destructive flooding. Along with storms in general, hurricanes and other tropical cyclones are projected to become more intense overall. Arizona and New Mexico typically receive 10 percent or more of their annual precipitation from storms that begin as tropical cyclones in the Pacific Ocean. In fact, some of the largest floods in the Southwest have occurred when a remnant tropical storm hit a frontal storm from the north or northwest, providing energy to empower a remnant tropical storm (Guido, 2008).
>
> Most global climate models are not yet precise enough to apply to land management at the ecoregional or National Forest scale. This limits regional and forest-specific analysis of the potential effects from climate change".

Due to the limitations of climate models, as stated above, site-specific analysis of climate change at the Forest level in regards to implementing the travel management rule remains improbable. Several unknowns further limit the discussion and analysis. These include lack of data regarding traffic numbers and projected increases or decreases in motorized visitors or passersby to the Forest, limited data and knowledge of current effects to ecosystem resiliency within the Forest as a result of motorized travel, and limited knowledge of surrounding areas' contributions to current and future climate impacts to assess cumulative effects.

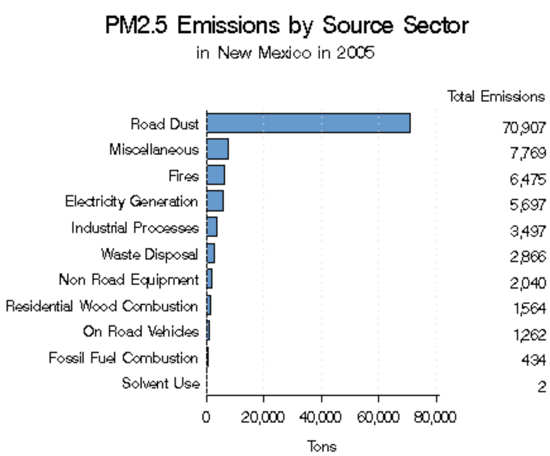
Projected future climate change may possibly affect New Mexico in a variety of ways. Public health can suffer due to an increase in extreme temperatures and severe weather events resulting in escalating transmission of infections, disease, and air pollution. Agriculture is vulnerable to altered temperature and rainfall patterns, and new pest problems. Forest ecosystems could face increased fire hazards and may be more susceptible to pests and diseases. Snowpacks could shrink and winter runoff may start in midwinter, not spring, with rain falling on snow triggering flood events.

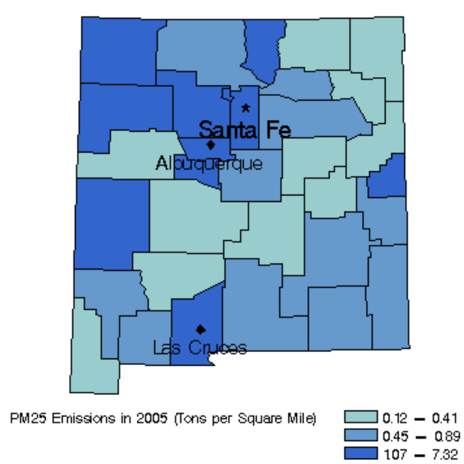
While the future of climate change and its effects across the Southwest remains uncertain, it is certain that climate variability will continue to occur across the Gila National Forest. Forest management activities should strive for promoting resilience and resistance of natural resources to impacts of climate change. Implementation should focus on maintenance and restoration of resilient native ecosystems, thus reducing the ecosystems' vulnerability to variations in climate. Diversity remains an integral component in these native ecosystems and synchronization should be avoided so that one failure does not lead to a domino effect. Projects must promote connected landscapes and endeavor to reset significantly disrupted animal and plant communities, thus restoring their flexibility to changes in climate. Management across the Forest will have to respond accordingly to climate change to minimize negative impacts from any ongoing or proposed activity.

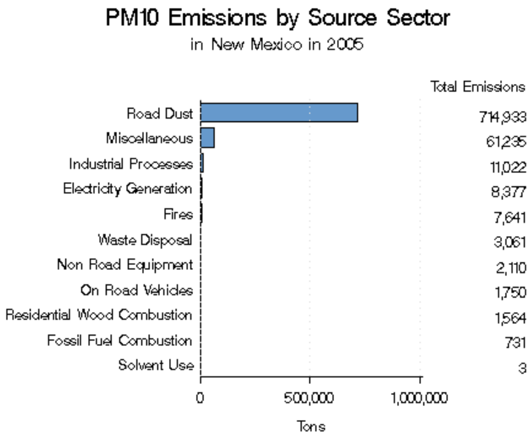
Fugitive Dust

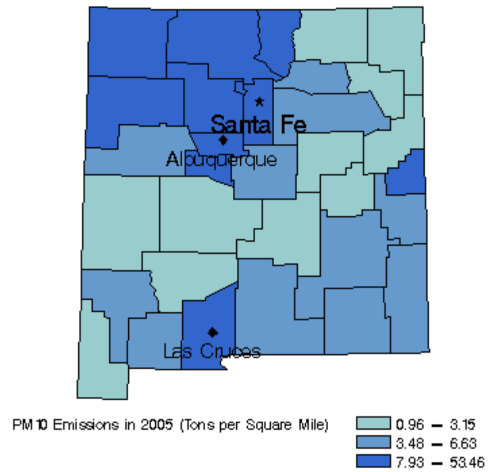
Fugitive dust is primarily lightweight soil particles, including silt and clay that arises to the atmosphere in an unconfined flow stream and become suspended in the air. It typically is a result of mechanical disturbance of granular material, but can also be a result of wind action on exposed soil. Fugitive road dust is a result of motor vehicle use on dry road surfaces. The force of wheels moving across the native surfaces causes pulverization of surface material. Dust is lofted by the rolling wheels as well as by the turbulence caused by the vehicle itself. This air turbulence can persist for a period of time after the vehicle passes. The quantity of dust emissions from a native surface road varies linearly with the volume of traffic. The silt content of the road surface layer, the distance traveled, the weight and speed of the vehicle, average number of wheels per vehicle, the road surface texture, the fraction of road surface material which is classified as silt (particles less than 75 microns in diameter), and the moisture content of the road surface, as well as weather conditions, influence the amount of dust produced. Surfaced roads produce a relatively smaller amount of dust than do native surface roads, especially during dry weather (US EPA, 2002).

Although a small amount of fugitive dust occurs naturally, the Environmental Protection Agency (EPA) lists road dust as the largest single source of particulate matter in the air (EPA, State and County Emissions Summaries, 2005). The following figures illustrate the most recent data for New Mexico.









Motorized use on dirt roads, in particular during windy weather conditions, can increase fugitive dust levels. Dust is created and raised into the air as motorized vehicles travel along the road surface and disturb soil crusts, break down soils, and generate wind currents. Once soil surfaces are disturbed, wind erosion may continue to perpetuate fugitive dust in the air (Lovich and Bainbridge, 1999). Adjacent to roads, dust generated from motorized traffic can cover plants which can interfere with plant growth by clogging pores and reducing light interception. In addition, fugitive dust can cause low visibility on unpaved roads.

Vehicle Emissions

Vehicle emissions in the project area are most concentrated along secondary highways. The Forest does not have jurisdiction on vehicle use levels or emissions in any of these concentrated motorized areas. Recreation motorized use and emissions in the project area are more localized to roads and motorized trails, with generally sufficient wind dispersion to avoid air quality concerns. The EPA has set standards for emissions of nonroad engines and vehicles (snowmobiles, ATVs, boats, etc.). The standards for emissions of oxides of nitrogen (NOx), hydrocarbons (HC), and carbon monoxide (CO) are to ensure compliance with the Clean Air Act, and to regulate those emissions that contribute significantly to the formulation of ozone and carbon monoxide. Compliance with these standards requires manufacturers to apply existing gasoline or diesel engine technologies to varying degrees, depending on the type of engine (US EPA, 2002).

Emissions controls on automobiles have become much more effective in recent years; however emissions from small engines still pose problems to air quality. In particular, OHV emissions from two-stroke engines (many are which are being phased out) do not burn fuel completely and produce significant amounts of airborne contaminants (nitrogen oxides, carbon monoxide, ozone, among other aldehydes, and extremely persistent polycyclic aromatic hydrocarbons (PAH), including the suspected human carcinogen, methyl tert-butyl ether (MTBE) (*http://www.arb.ca.gov/msprog/offroad/sm_en_fs.pdf*).

Some airborne contaminants settle onto plants or into soils and function as fertilizers, thus causing changes in plant community composition and altering growth rates (Bazzaz & Garbutt, 1988; Ferris & Taylor, 1995, Falkengren-Grerup, 1986; Holzapfel & Schmidt, 1990; Angold, 1997). The accumulation of emissions contaminants has been found in the tissues of plants and animals exposed to them. Prior to the ban on leaded gasoline, lead also was prevalent in plants and animals near paved roads and other travel routes, and because it persists in the environment, it can still have impacts when contaminated soils are mobilized (USGS, 2007). Sulfur dioxide, which can be taken up by vegetation, may result in altered photosynthetic processes (Winner & Atkison, 1986; Mooney, et al., 1988).

OHV emissions also contain a variety of heavy metals, including zinc, copper, nickel, chromium, and lead (National Research Council, 1986). In terms of overall quantity, lead was one of the most significant heavy metals emitted prior to the ban on leaded gasoline in 1996 (Daines et al, 1970; Motto et al, 1970; Quarles et al, 1974; Wheeler and Rolfe, 1979). The declining gradient in lead concentrations away from roadsides may be due, in part, to the direction of surface water flow (Byrd et al., 1983), as soil and other debris to which lead adheres were flushed away by the volume of water that runs off road surfaces. Although lead emissions from gasoline have declined dramatically since control policies were implemented in the 1970s (Forman et al, 2003), it persists in soils and can continue to move through the environment when contaminated soils are dislodged.

Laws, Regulations and Policies

Applicable Laws

Clean Air Act of 1963 (77 Stat. 392; 42 U.S.C. 1857) - Gave the Federal government, for the first time, enforcement powers regarding air pollution.

Clean Air Act Amendments of 1970 (84 Stat. 1676; 42 U.S.C. 1857b) - Sharply expanded the Federal role in setting and enforcing ambient air quality standards, including regulating land management practices to achieve and maintain such standards.

Clean Air Act Amendments of 1977 (91 Stat. 685; 42 U.S.C. 7401 et seq.) - Established as a national goal preventing any future impairment, of visibility of Class I areas from man-made air pollution. Class I Federal areas include all International Parks, all National Wilderness Areas that exceed 5,000 acres, all National Memorial Parks that exceed 5,000 acres, and all National Parks that exceed 6,000 acres.

Clean Air Act Amendments of 1990 (P.L. 101-549; 42 U.S.C. 7661f) - EPA established limits on how much of a pollutant can be in the air anywhere in the United States. States are not allowed to have weaker pollution controls than those set for the whole country. States are required to develop state implementation plans (SIPs) that explain how each state enforces the Clean Air Act. A SIP is a collection of the regulations a state will use to clean up polluted areas. EPA must approve each SIP, and if a SIP isn't acceptable, EPA can take over, enforcing the Clean Air Act in that state.

- Approval and Promulgation of Implementation Plan for New Mexico: General Conformity Rules (March 1997) –enable the New Mexico Environment Department to review conformity of all Federal actions (See 40 CFR part 51, subpart W--

Determining Conformity of General Federal Actions to State or Federal Implementation Plans) with the control strategy SIPs submitted for the nonattainment and maintenance areas within the State except for actions within the boundaries of Bernalillo County.

Organic Administration Act of 1897 (30 Stat. 34 amended; 16 U.S.C. 473-478, 479-482, 551) - Authorized the Secretary of Agriculture to manage the National Forests to improve and protect the forests, to secure favorable conditions of water flow, and to furnish a continuous supply of timber.

Multiple Use Sustained Yield Act of 1960 (74 Stat. 215; 16 U.S.C. 528-531) - Established a policy of multiple use, sustained yield management for the renewable resources of the National Forest System.

National Environmental Policy Act of 1969 (83 Stat. 852 as amended; 42 U.S.C. 4321, 4331-4335, 4341, 4347) - Required that environmental considerations be incorporated into all Federal policies and activities, and required all Federal agencies to prepare environmental impact statements for any actions significantly affecting the environment.

Forest and Rangeland Renewable Resources Planning Act of 1974 (88 Stat. 476 as amended; 17 U.S.C. 1600-1614) - Provided for continuing assessment and long-range planning of the Nation's forest and range renewable resources under the jurisdiction of the Secretary of Agriculture.

National Forest Management Act of 1976 (90 Stat. 2949; 16 U.S.C. 472a, 476, 476 (note), 500, 513-516, 521b, 528 (note), 576b, 594-2 (note), 1600 (note), 1600-1602, 1604, 1606, 1608-1614) - Established additional standards and guidelines for managing the National Forests, including directives for National Forest land management planning, and public participation. It is the primary statute governing the administration of national forests.

Gila National Forest Plan Standards and Guidelines (1986)

- Minimize air pollution form land management activities through application and timing of improved management practices (p. 12)
- Prepare air quality and smoke management plans, and review and make recommendations for proposed sources that may impact the Forest’s Class I and Class II wilderness areas (p. 43)
- Review and make recommendations for state air quality redesignations for State Implementation Plans (SIPs), Prevention of Significant Deterioration Permits (PSDs), and other air quality issues. (p. 43)
- Develop and initiate, within the first decade, a Forest air resource monitoring plan to evaluate future impacts. (p. 43)

For Gila Wilderness Class I airshed:

- Maintain high quality visual conditions. The form, line, texture, and color of characteristic landscapes will be clearly distinguishable when viewed as middle ground. Cultural resources and ecosystems will remain unmodified by air pollutants.

Determine baseline information and the background condition of the above Air Quality Related Values and specify limits of acceptable change that will protect affirmatively these values in class I areas.

- Perform Prevention of Significant Deterioration (PSD) permit application review to determine the potential effect increased emissions from major stationary sources will have on Air Quality Related Values (AQRV) of this National Forest Class I area. Impacts of air pollution generating activities will be predicted using current modeling techniques.

Forest Plan Amendment No. 7 Air Quality Related Values (1992)
Aquatic Resources – Levels of acceptable change:

Acid neutralizing capacity level (based on current level of sensitivity):

Current level	Levels of acceptable change
Sensitive < 200 μeq/e	No decrease
Moderately sensitive	
200-400 μeq/e	10% decrease but not less than 200 μeq/e

pH (levels based on current values):

Current level	Level of acceptable change
Less than 6.6 SU	No decrease
6.6 to 7.0 SU	No decrease greater than 0.1 SU
Greater than 7.0 SU	No decrease greater than 0.5 SU and not below 6.8 SU

Terrestrial Resources – Limits of acceptable change:

Lichens – no specific level; periodic monitoring
Soils – base saturation; a change of 10%; cation exchange capacity – a 10% deviation from normal range
Conifer needle longevity – 25% change in needle retention
Ozone injury to Ponderosa pine – concentration recommended by Fox, D.G. (1989, A Screening Procedure to Evaluate Air Pollution Effects on Class I Wilderness Areas)

Visibility (throughout the Class I Gila Wilderness only, year round) – Limits of acceptable change:

Layered haze – a 2% change in contrast;
Uniform haze – a Just Noticeable Change (as measured by extinction).

Forest Service Manual (FSM) 2500 Watershed and Air Management – Chapter 2580 Weather Program (06/1/1990)
2580.2 Objectives

- Protect air quality related values with Class I areas
- Control and minimize air pollutant impact from land management activities
- Cooperate with air regulatory authorities to prevent significant adverse effects of air pollutants and atmospheric deposition on forest and range land resources

2580.3 Policy

- Integrate air resource management objectives into all resource planning and management activities.
- Use cost effect methods of achieving resource management objectives

Forest Service Manual (FSM) 2580 Watershed and Air – Chapter 2580 Air Resource Management (Region 3 Supplement 06/30/2005)

2580.3 Policy

- Minimize the impact of the Region's management activities on air quality and comply with requirements of Federal, state and local air regulatory authorities
- Affirmatively protect Air Quality Related Values (AQRVs) within the Region's Class I wilderness areas.
- Protect Resource Values Affected by Air Pollution (RVAAP) on all National Forest System Lands.
- Maintain or improve air quality within Class I airsheds.

2580.4 Responsibility

2580.4.2 (Forest Supervisors)

e. conduct conformity determinations as required by EPA rule pursuant to Clean Air Act Section 176(c).

f. consult with State and local air quality regulatory authorities on pollution impacts to National Forests. Document written or verbal complaints for Class I area visitors regarding visibility or other AQRV impairment. Forward comments to the permitting authority and recommend actions needed to protect these resources

Executive Order (EO) 11644 (February 8, 1972) and EO 11989 (May 24, 1977) – Provide direction for Federal agencies to establish policies and provide for procedures to control and direct the use of OHVs on public lands so as to: (1) protect the resources of those lands; (2) promote the safety of all users of those lands; and (3) minimize conflicts among the various users on those lands.

- The Forest Service developed regulations in response to the Eos (36 CFR, 219, 261 and 295). Under those regulations, OHV use can be restricted or prohibited to minimize: (1) damage to the soil, vegetation, watershed and impacts to water quality, or other resources of public lands; (2) harm to wildlife or wildlife habitats; and (3) conflict between the use of OHVs and other types of recreation.

New Mexico Air Quality Control Act (Sections 74-2-1 to 74-2-17 NMSA 1978) and New Mexico Ambient Air Quality Standards and Air Quality Control Regulations —provide state and local air quality regulations that affect certain management activities in the Southwestern Region

Methodology and Analysis Process

The analysis area under consideration for air quality impacts is the area within a radius of 62 miles (100 km) from the edge of the project area. NMED's air quality permitting system suggests that sources within a radius of 62 miles be considered, especially those located downwind of the project. Cumulative effects for air quality takes into account the impacts of the alternatives when combined with past, present, and foreseeable future actions and events. Past actions may have no effect if the action is no longer contributing emissions to the air.

Data Sources
Data sources for this analysis included existing surveys, inventories and data bases incorporated into the Gila NF GIS layers:

- Roads, associated maintenance levels, road widths and road miles from the Gila NF Infra Database (see engineering section).
- User created routes inventory (Forest and Public)
- NM air basins (State of New Mexico)

Assumptions:

- Public education, compliance, and enforcement of regulations will generally limit public travel to designated routes.
- The action alternatives involve the closure of routes to vehicle use by the public and not the physical removal (decommissioning) or roads. The removal of roads typically involves the extraction of culverts, the ripping of the road surface, and in some cases the re-contouring of the ground surface to blend in with the natural topography. It typically can take more than 20 years for closed roads to revegetate to background conditions, if traffic is successfully eliminated.
- Closed routes without fixed barriers are expected to revegetate minimally. These routes will not disappear from the landscape until decommissioned, and will continue to be a minor source of fugitive dust during windy periods.
- Miles by traffic use are unknown. Traffic use on maintenance level 2 routes and user-created routes is generally low, and traffic use on maintenance levels 3, 4, and 5 routes is generally moderate.
- An undetermined amount of unauthorized routes exist that are not included in any current inventory.
- Fugitive dust is the major air pollutant from native-surface roads. Other pollutants from roads, such as trace metals and man-made chemicals may be attached to dust. Thus, the relative effects of the alternatives with regard to fugitive dust apply to trace metals and man-made chemicals.
- The designation of motorized routes does not translate to changes in numbers of motorized vehicles, either full-size or off road vehicles, that use the Forest, just location of use.
- The designation of motorized routes does not translate to changes in emissions of vehicles that use the Forest, just location of where emission may occur.

- Minimal fugitive dust emissions will be produced from motorized dispersed camping within designated corridors and areas. Acres associated with this activity will not be included in this analysis
- Minimal fugitive dust emissions will be produced from motorized big game retrieval over vegetated surfaces. Acres associated with this activity will not be included in this analysis.
- The majority of dust generated from roads is a direct result of motorized traffic on the roads. Wind erosion plays a minor role.
- Road miles are converted to acres of disturbance (miles of road x assumed road widths) based on road maintenance levels. The following average road widths were used:

Routes	Average Assumed Width of Route (ft)
Single Track Trails	3
Maintenance Level 1 – Decommissioned*	0
Maintenance Level 1 – Closed	12
Maintenance Level 2	12
Maintenance Level 3	14
Maintenance Level 4	20
Maintenance Level 5	20
ATV Trails	8
Non Forest Service Roads	16

*Decommissioned is defined as returning the route to its natural (pre-road) condition.

Data Limitations: The amount of fugitive dust generated from acres of disturbed roadways on Forest has not been quantified, nor is there data that documents the frequency or timing of travel that occurs on these roadways. Estimates of increases or decreases in fugitive dust generation are relative to corresponding increases and decreases in open roadways by alternative.

Issue Statements

1. The proposed motorized routes specifically the type, extent, level of use and location of motorized routes may lead to resource, recreation, social and economic impacts.
2. Motorized dispersed camping with proposed designated corridors and areas may lead to resource, recreation, social and economic impacts.
3. The proposed motorized big game retrieval may lead to resource, recreation, social and economic impacts.
4. The proposed designated areas, specifically for OHV activities may lead to resource, recreation, social and economics.

Key Indicators

Indicator Measure: acres of roaded disturbance with potential to contribute to fugitive dust and visibility impairment

Criteria for measure: acres of roaded disturbance Forestwide and per airshed,

Indicator Measure: acres with potential to impact Gila Wilderness Class I airshed
Criteria for measure: acres of roaded disturbance within 1 mile of Gila Wilderness Class I airshed

Effects

Each of the alternatives are analyzed to determine if there is potential for motorized vehicle travel on the Gila National Forest to degrade air quality, contribute to violations of National Ambient Air Quality Standards, contribute to visibility impairment, or affect the Gila Wilderness Class I airshed beyond its current condition. The direct effects to air quality by motorized use on native surface routes are directly related to the level of use the Forest receives. While this project will not result in a change in the levels of use, it will result in a change in the locations of use and acres available for negative impacts. Tables 5-10 provide a summary of potential acres of roaded areas that would be available for vehicular traffic to produce fugitive dust.

Under Alternatives C, D, E, F, and G, fewer miles of roads and trails are open for motorized use as compared to Alternative B (No Action). Alternative B would not produce fugitive dust beyond the amount produced currently by routine forest management or user activities. The effects of Alternatives C, D, E, F, and G would be similar to Alternative B, except that impacts from fugitive dust and vehicle emissions may be reduced because fewer miles and acres of roaded disturbance would be available for motorized vehicle use. It is possible that the same amount of motorized use would occur across the Forest, with users increasing their activities on the remaining open routes, if other routes are made unavailable (closed). Closed roads would continue to be a minor source of fugitive dust during wind events until the road has been decommissioned, or has returned to pre-road conditions naturally.

The roaded areas available for disturbance are displayed 1) Forestwide, 2) by each of the four airsheds occupied by the Gila National Forest, and 3) by the Gila Wilderness Class I airshed. Analysis indicates that, Forestwide, Alternative E provides the greatest reduction in potential roaded acres (-39%) that may impact air quality and reduce visibility within a Class I airshed, followed by Alternative D (-25%). Alternatives F (-17%) and G (-18%) reduce motorized routes by virtually the same amounts. Alternative C provides the least reduction in motorized routes (-1%), and would leave the most roaded acres available for potential disturbance. A discussion follows Table 10 of air quality impacts under each alternative.

Table 5 Forestwide—Potential Air Quality impacts by Alternative

Forestwide Miles & Acres with potential to contribute to fugitive dust and add to visibility impairment Forestwide	Miles	Change in Miles from No Action	% Increase or decrease from No Action No Action	Acres	Change in Acres from No Action	% Increase or decrease from No Action
Alternative B – No Action	4,686			6,894		
Alternative C	4,633	-54	-1%	6,818	-77	-1%
Alternative D	3,441	-1,245	-27%	5,179	-1,715	-25%
Alternative E	2,756	-1,930	-41%	4,215	-2,679	-39%
Alternative F	3,817	-869	-19%	5,713	-1,181	-17%
Alternative G	3,785	-901	-19%	5,666	-1,228	-18%

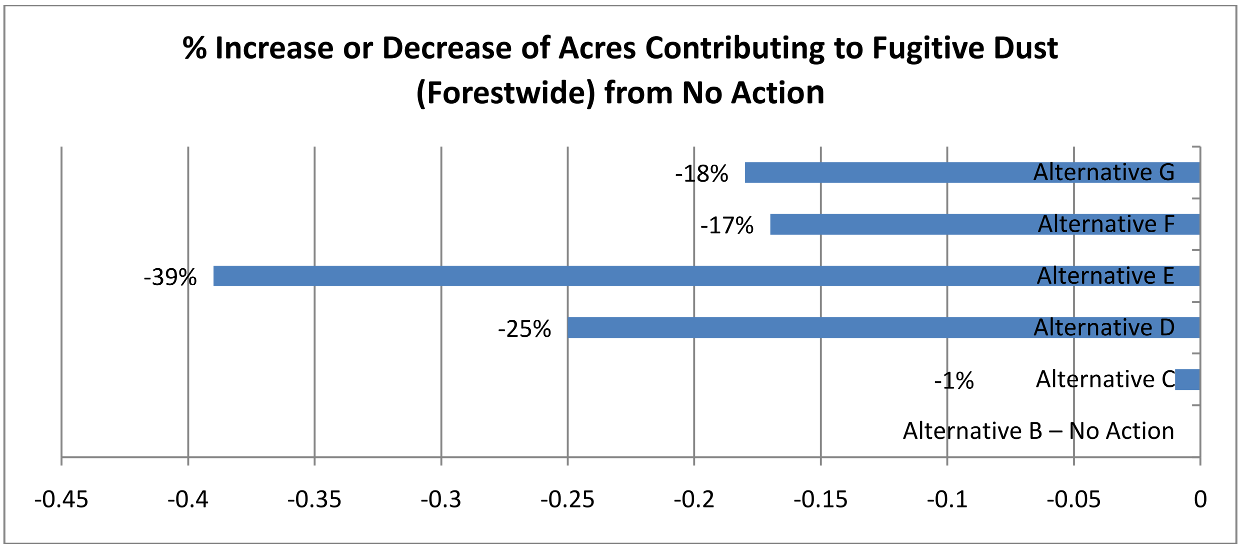


Table 6. Lower Colorado River Airshed—Potential Air Impacts by Alternative

Lower Colorado River Miles & Acres with potential to contribute to fugitive dust and add to visibility impairment	Miles	Change in Miles from No Action	% Increase or decrease from No Action No Action	Acres	Change in Acres from No Action	% Increase or decrease from No Action
Alternative B – No Action	3,787			5,668		
Alternative C	3,816	29	1%	5,653	-15	0%
Alternative D	2,860	-928	-24%	4,313	-1,355	-24%
Alternative E	2,262	-1,525	-40%	3,475	-2,193	-51%
Alternative F	3,169	-618	-16%	4,749	-919	-26%
Alternative G	3,142	-645	-17%	4,710	-958	-20%

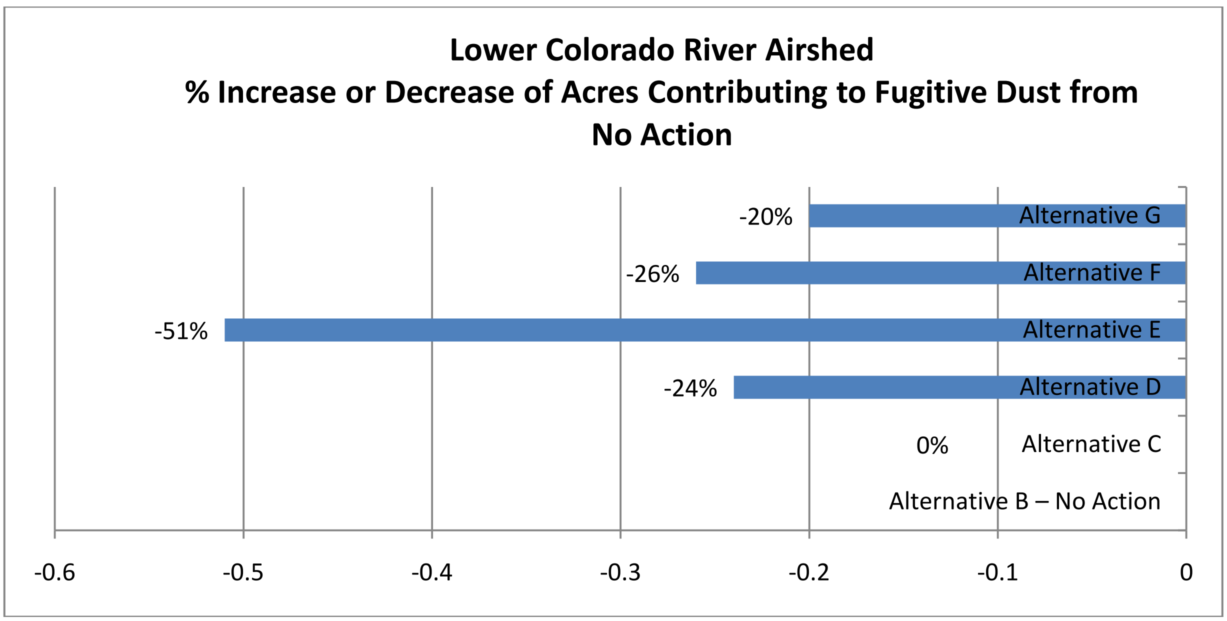


Table 7. Lower Rio Grande Airshed—Potential Air Impacts by Alternative

Lower Rio Grande Miles & Acres with potential to contribute to fugitive dust and add to visibility impairment	Miles	Change in Miles from No Action	% Increase or decrease from No Action No Action	Acres	Change in Acres from No Action	% Increase or decrease from No Action
Alternative B – No Action	238			338		
Alternative C	191	-47	-20%	277	-61	-18%
Alternative D	151	-87	-37%	219	-119	-35%
Alternative E	145	-93	-39%	210	-128	-38%
Alternative F	174	-64	-27%	252	-86	-25%
Alternative G	174	-64	-27%	252	-86	-25%

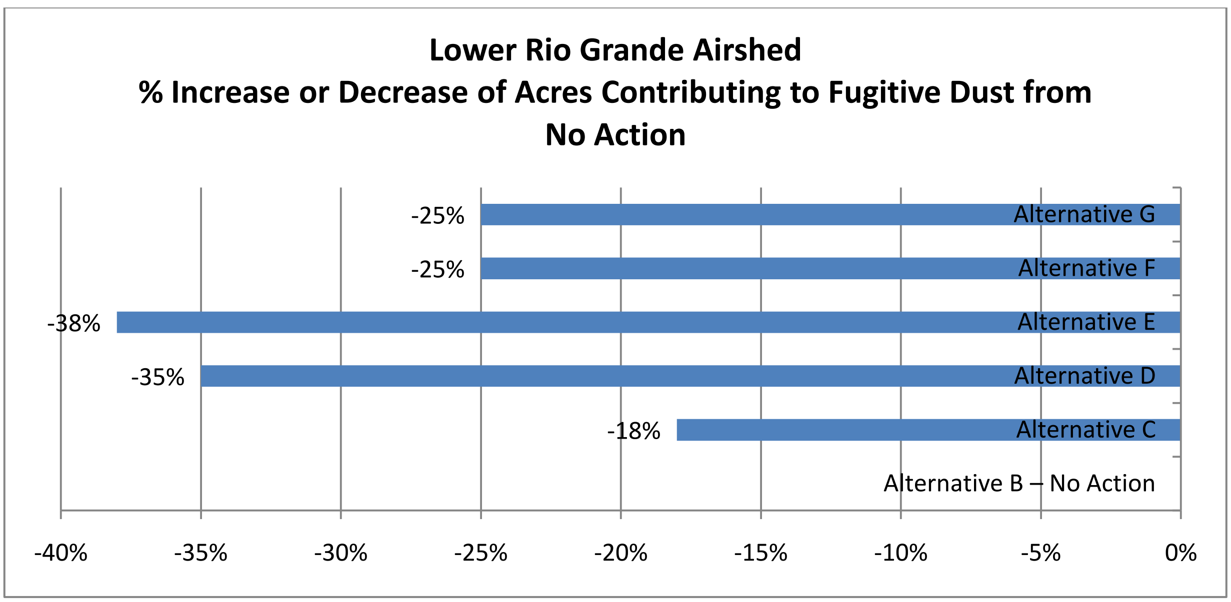


Table 8. Southwestern Closed Airshed—Potential Air Impacts by Alternative

Southwestern Closed Miles & Acres with potential to contribute to fugitive dust and add to visibility impairment	Miles	Change in Miles from No Action	% Increase or decrease from No Action No Action	Acres	Change in Acres from No Action	% Increase or decrease from No Action
Alternative B – No Action	331			395		
Alternative C	302	-29	-9%	404	9	2%
Alternative D	199	-132	-40%	297	-97	-25%
Alternative E	160	-171	-52%	241	-153	-39%
Alternative F	221	-109	-33%	330	-65	-16%
Alternative G	221	-110	-33%	329	-65	-17%

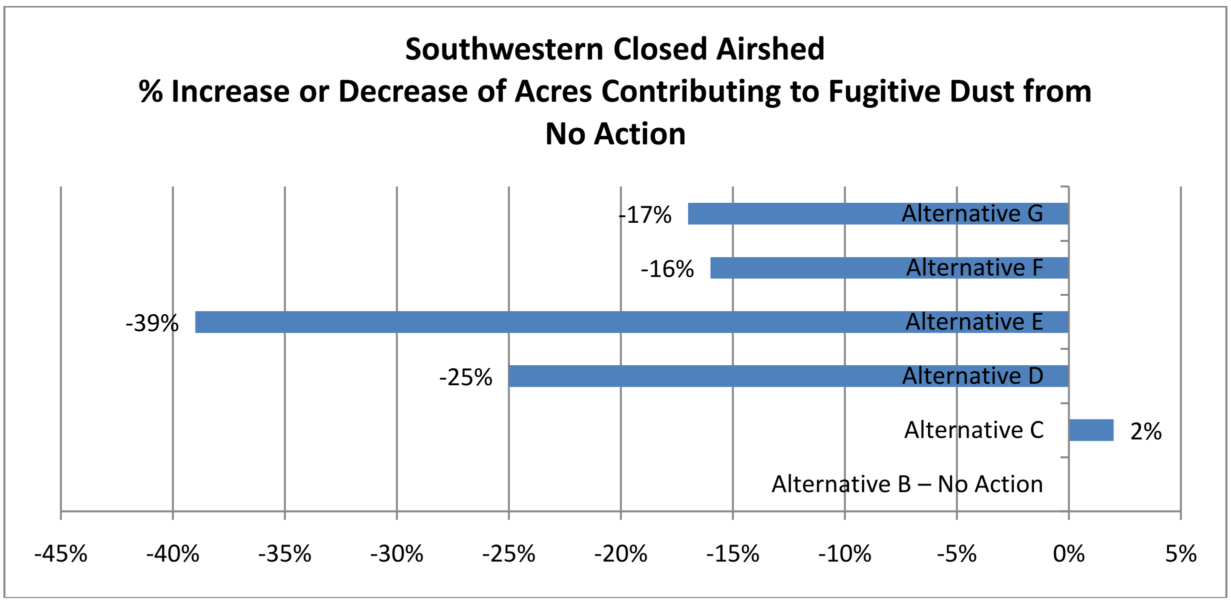


Table 9. Western Closed Airshed—Potential Air Impacts by Alternative

Western Closed Miles & Acres with potential to contribute to fugitive dust and add to visibility impairment	Miles	Change in Miles from No Action	% Increase or decrease from No Action No Action	Acres	Change in Acres from No Action	% Increase or decrease from No Action
Alternative B – No Action	330			494		
Alternative C	324	-7	-2%	484	-10	-2%
Alternative D	232	-98	-30%	351	-143	-29%
Alternative E	189	-141	-43%	288	-205	-42%
Alternative F	253	-77	-23%	382	-112	-23%
Alternative G	249	-82	-25%	375	-119	-24%

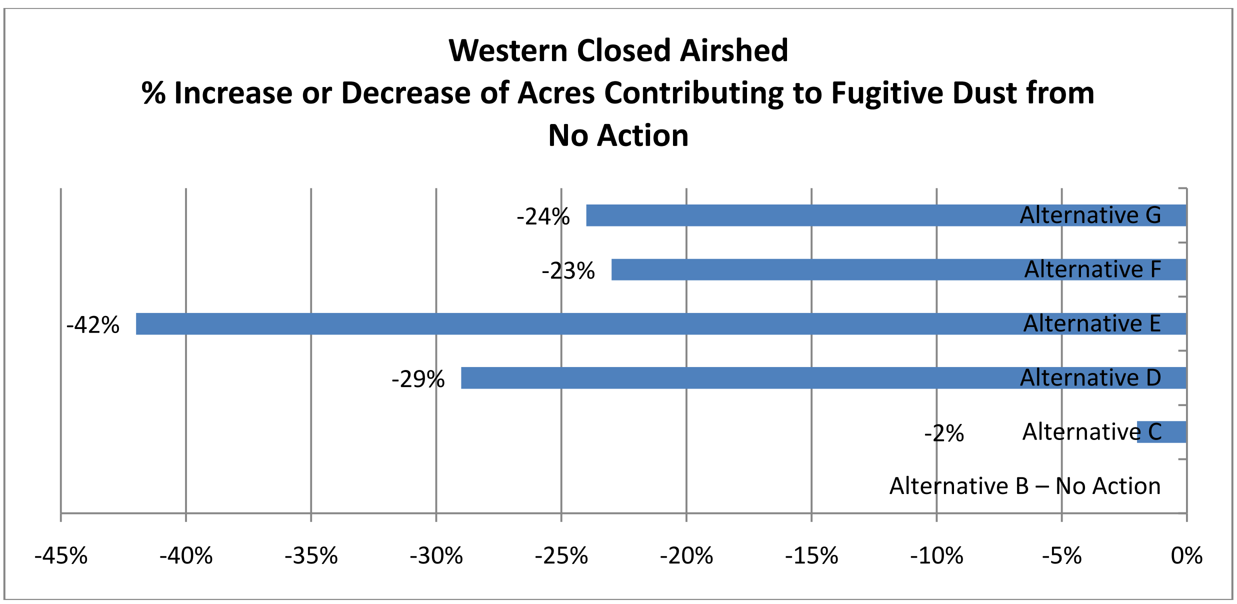
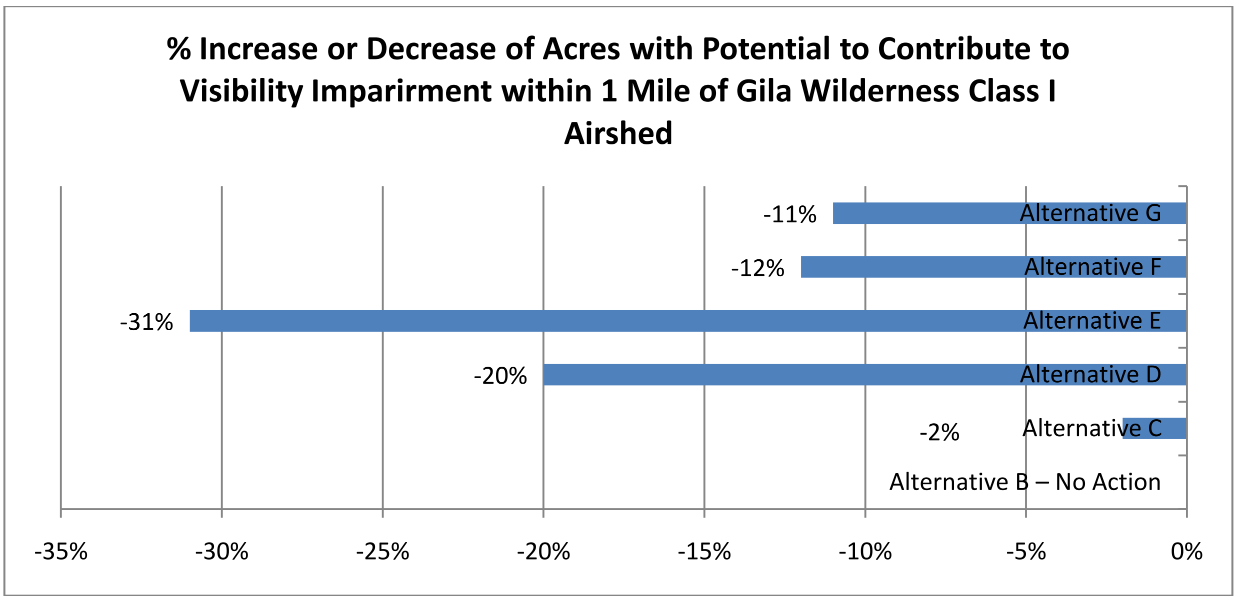


Table 10. Miles/Acres of Routes within 1 Mile of Gila Wilderness Class I Airshed

Miles & Acres within 1 mile of Gila Wilderness -- potential to contribute to add to visibility impairment	Miles	Change in Miles from No Action	% Increase or decrease from No Action No Action	Acres	Change in Acres from No Action	% Increase or decrease from No Action
Alternative B – No Action	246			349		
Alternative C	224	-22	-9%	341	-9	-2%
Alternative D	182	-65	-26%	280	-70	-20%
Alternative E	155	-92	-37%	241	-109	-31%
Alternative F	202	-44	-18%	309	-40	-12%
Alternative G	204	-42	-17%	311	-38	-11%



Effects Common to All Alternatives:

Effects that will carry out throughout all alternatives are related to fugitive dust, vehicle emissions, air quality within the Gila Wilderness Class I airshed, and potential impacts to climate change. The implementation of any of the action alternatives will impact air quality to some degree, with the potential for negative impacts varying by the number of roads that will remain open for motorized use in each proposal.

Fugitive dust levels produced from Forest roads result from routine forest management, user activities, and wind disturbance on native road surfaces. While wind disturbance can release fugitive dust from the road even without motorized interaction, the primary release of fugitive dust into the atmosphere is a result of wheels interacting with the native road surface and releasing dust particles into the air.

The main effects from fugitive dust as a result of motorized routes are reduced visibility on and adjacent to roads and increased levels of small diameter particulates (specifically $PM_{2.5}$ and PM_{10}) which can impact human health. Fugitive dust impacts depend on the quantity and drift potential of the dust particles that enter the air column. Large particles will typically settle out near the source. However, fine particles of dust may disperse over a much wider area, in particular on a windy day. These fine particles may float for a long time due to lack of gravitational settling. Drift distances for fugitive dust have been estimated based on particle size and wind speeds. These estimates indicate that for a typical mean wind speed of 10 mph, particles larger than about 100 microns in aerodynamic diameter are likely to settle out within 20 to 30 feet from the edge of the route. Particles that are 30 to 100 microns in diameter are likely to settle further out, but usually within a few hundred feet of the source, depending on wind turbulence. Smaller particles such as $PM_{2.5}$ and PM_{10} have much slower settling rates and are much more likely to be impacted by atmospheric turbulence. The release of these smaller particles becomes an indirect effect to air quality over a more widespread area. However, $PM_{2.5}$ and PM_{10} levels would rapidly disperse over this larger area as they are carried by winds.

Exposure to particulate matter can aggravate a number of respiratory illnesses and may even cause early death in people with existing heart and lung disease. Both long-term and short-term exposure can have adverse health impacts. These finer particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Emissions within the Forest boundary from automobile use would be most concentrated adjacent to motorized roads and trails. The direct effects of these emissions are formation of $PM_{2.5}$, carbon monoxide, volatile organic compounds, nitrogen oxide, and production of diesel engine particulate matter. Indirect effects of vehicle emissions are related to air quality degradation as a result of $PM_{2.5}$ and $PM_{10,}$ reduced ability of the blood to carry oxygen based on exposure to carbon monoxide, and formation of ozone in the atmosphere when hydrocarbons and nitrogen oxide precursor emissions react in the presence of sunlight. Ozone is a strong irritant that can constrict the airways, forcing the respiratory system to work harder to provide oxygen to the rest of the body.

Low numbers of vehicle traffic and good wind dispersion across the Forest are generally sufficient to avoid long-lasting air quality impacts. In addition, automobile emissions are controlled by standards that are designed to regulate outputs that contribute to the formulation of ozone and carbon monoxide. Emissions from OHVs, especially those with two-stroke engines, would have the most negative impact on air quality, as these can produce significant amounts of air borne contaminants. These contaminants can settle onto plants or into soils and act as fertilizers. If these volumes of emissions are significant, the contaminants can cause changes in plant community composition and alter growth rates. Some contaminants can persist in soils for several years.

Air quality within the Gila Wilderness Class I airshed can be negatively impacted by motorized routes on adjacent native surface roads as this activity can reduce visibility by the production of dust. Fine particulate matter produced from Forest roads that becomes suspended in the air can act as light scatterers and contribute to regional haze. Currently, the

Gila Wilderness` Area Class I airshed is certified for visibility impairment due to regional haze.

Impacts to *climate change* may occur from the burning of fossil fuels by motorized vehicles. This burning results in the emission of greenhouse gases including CO_2, methane (CH_4), nitrous oxide (N_2O), and hydrofluorocarbons (HFCs). These gases are emitted as CO_2, CH_4, N_2O emissions resulting directly from operation of the vehicle, and CO_2 emissions resulting from operating the air conditioning system.

Alternative B – No Action

Impacts to air quality as a result of current motorized use on the Forest are detailed above in the Effects Common to All Alternatives. Under Forest Service jurisdiction, there are currently 4,686 miles of open routes that create 6,894 acres of roaded disturbance. These routes are of varying widths based on maintenance levels. Cross country travel by motor vehicles is permitted in all areas, except designated Wilderness, roads, trails, or areas specified in Forest Orders, and restricted off-road vehicle areas identified in the Forest Land Management Plan. This cross country travel includes access for motorized big game retrieval, dispersed recreation and camping areas. Currently, cross country travel associated with motorized big game retrieval, motorized dispersed recreation, and camping areas is not repetitious enough in the same location to generate notable amounts of fugitive dust. This would only occur in an area where an unauthorized route has been created, the route was frequently traveled, and little to no vegetation remained on the route.

Effects Unique to each Action Alternative

Each action alternative will be evaluated based on the potential risk to air quality relative to the change from the No Action alternative. The effects common to all alternatives will have the potential to either increase, decrease or remain the same, based on the change from the No Action Alternative. The relative risk of change from baseline is derived based on the potential acres of disturbance that are possible under each of the action alternatives.

Alternative C

General Direct and Indirect Effects

Issue 1 – Motorized Big Game Retrieval (1 mile corridor for elk, deer, bear, mountain lion, javelina, pronghorn)—minimal effects, similar to the No Action Alternative, would result under this activity. MBGR typically occurs over vegetated surfaces where fugitive dust is not generated. This activity would not be repetitious enough in the same location to mobilize significant amounts of fine particles.

Issue 2 – Motorized Dispersed Recreation (300' corridor designated along specific routes)—minimal effects, similar to the No Action Alternative, would result under this activity. Motorized dispersed recreation typically occurs over vegetated surfaces where fugitive dust is not generated. This activity would not be repetitious enough in the same location to mobilize significant amounts of fine particles.

Issue 3 – Areas (39 areas: 1 motorcycle/ATV; 38 camping)—The Travel Management Rule defines 'areas' as open to all motorized vehicle use. The 38 camping areas proposed in this alternative are existing sites with traditional use related to camping. The majority of these sites are less than 1 acre in size. Limited ATV activity has occurred on these sites in the past, and it is anticipated that activity will continue to be limited. Minimal effects to air quality would result as a continuation of this traditional use. The motorcycle/ATV area proposed is located near the Village of Reserve, within the Lower Colorado River airshed. This area covers approximately 8 acres and is located within an old borrow pit near the previous landfill site. Currently, there is little to no herbaceous vegetation at this area and the site would continue to remain denuded of most vegetation under this proposal. There would be recurrent mobilization of fugitive dust within these eight acres during periods of use. This area would be a localized source of negative impacts to air quality.

Issue 4 – Motorized Routes – Effects to air quality under this alternative would be similar to the No Action Alternative. Proposed open routes under Forest Service jurisdiction total 4,633 miles of open routes that create 6,818 acres of roaded disturbance. This represents a 1% reduction Forestwide from the No Action, which is negligible in terms of change. Alternative C, by airshed shows negligible reduction in acres of potential disturbance in the Lower Colorado River airshed acres, approximately 18% reduction in acres in the Lower Rio Grande airshed, approximately 2% reduction in acres in the Southwestern Closed airshed, and approximately a 2% reduction in the Western Closed airshed.

Alternative D

General Direct and Indirect Effects

Issue 1 – Motorized Big Game Retrieval (within 300' dispersed camping corridor) — minimal effects similar to Alternative B—No Action

Issue 2 – Motorized Dispersed Recreation (300' corridor designated along specific routes) — minimal effects similar to Alternative B—No Action

Issue 3 – Areas (no areas designated)—There would be no negative impacts to air quality due to camping areas. This alternative is an improvement over Alternatives C, F, and G because there is no proposed eight-acre motorcycle/ATV area that would contribute to recurring, localized fugitive dust emissions near the Village of Reserve.

Issue 4 – Motorized Routes—Effects to air quality under this alternative would be similar to Alternative B, with the possibility of a reduction in negative impacts from fugitive dust due to fewer miles of routes and acres of roaded disturbance available for motorized vehicle use. Proposed open routes under Forest Service jurisdiction total 3,441 miles of open routes that create 5,179 acres of roaded disturbance. This represents a 25% reduction from the No Action. Alternative D, by airshed shows a 24% reduction in acres of potential disturbance in the Lower Colorado River airshed acres, approximately 35% reduction in acres in the Lower Rio Grande airshed, approximately 25% reduction in acres in the Southwestern Closed airshed, and approximately a 29% reduction in the Western Closed airshed.

Alternative E

General Direct and Indirect Effects

Issue 1 – Motorized Big Game Retrieval (No MBGR permitted)—No effect to air quality

Issue 2 – Motorized Dispersed Recreation (No camping corridors designated)—No effect to air quality

Issue 3 – Areas (no areas designated) – Same as Alternative D—no negative impacts to air quality due to areas.

Issue 4 – Motorized Routes—Effects to air quality under this alternative would be similar to Alternative B, with the possibility of a reduction in negative impacts from fugitive dust due to fewer miles of routes and acres of roaded disturbance available for motorized vehicle use. Proposed open routes under Forest Service jurisdiction total 2,756 miles of open routes that create 2,679 acres of roaded disturbance. This represents a 39% reduction from the No Action, which represents the largest reduction in open routes of all alternatives. Alternative E, by airshed shows 40% reduction in acres of potential disturbance in the Lower Colorado River airshed acres, approximately 38% reduction in acres in the Lower Rio Grande airshed, approximately 39% reduction in acres in the Southwestern Closed airshed, and approximately a 42% reduction in the Western Closed airshed.

Alternative F

General Direct and Indirect Effects

Issue 1 – Motorized Big Game Retrieval (within ½ mile of motorized routes, elk only)—minimal effects similar to Alternative B—No Action

Issue 2 – Motorized Dispersed Recreation (300' corridor designated along specific routes) —minimal effects similar to Alternative B—No Action

Issue 3 – Areas (39 areas: 1 motorcycle/ATV; 38 camping)—same as Alternative C

Issue 4 – Motorized Routes—Effects to air quality under this alternative would be similar to Alternative B, with the possibility of a reduction in negative impacts from fugitive dust due to fewer miles of routes and acres of roaded disturbance available for motorized vehicle use. Proposed open routes under Forest Service jurisdiction total 3,817 miles of open routes that create 5,713 acres of roaded disturbance. This represents a 17% reduction from the No Action. Alternative F, by airshed shows a 26% reduction in acres of potential disturbance in the Lower Colorado River airshed acres, approximately 25% reduction in acres in the Lower Rio Grande airshed, approximately 16% reduction in acres in the Southwestern Closed airshed, and approximately a 23% reduction in the Western Closed airshed.

Alternative G

General Direct and Indirect Effects

Issue 1 – Motorized Big Game Retrieval (within 300' dispersed camping corridor) — same as Alternative D

Issue 2 – Motorized Dispersed Recreation (300' corridor designated along specific routes) —minimal effects similar to Alternative B—No Action

Issue 3 – Areas (39 areas: 1 motorcycle/ATV; 38 camping)—same as Alternative C

Issue 4 – Motorized Routes—Effects to air quality under this alternative would be similar to Alternative B, with the possibility of a reduction in negative impacts from fugitive dust due to fewer miles of routes and acres of roaded disturbance available for motorized vehicle use. Proposed open routes under Forest Service jurisdiction total 3,785 miles of open routes that create 5,666 acres of roaded disturbance. This represents an 18% reduction from the No Action, which is virtually the same as Alternative F. Alternative G, by airshed shows a 20% reduction in acres of potential disturbance in the Lower Colorado River airshed acres, approximately 25% reduction in acres in the Lower Rio Grande airshed, approximately 17% reduction in acres in the Southwestern Closed airshed, and approximately a 24% reduction in the Western Closed airshed.

Cumulative Effects

In all action alternatives, the cumulative effects of fugitive dust on air quality caused by the proposed change in motorized travel on designated routes, combined with all other activities, would result in only negligible differences than those currently occurring. Some past actions may no longer be having any effect on air quality. The actions contributing to cumulative effects include those industrial activities listed earlier in Table 3 as well as other activities occurring on Forest lands such as prescribed fire, wildland fire, motorized traffic, and harvest operations, because they have caused or have the potential to cause changes in air quality.

In all alternatives, the cumulative effects of fugitive dust on air quality caused by motorized travel on designated routes would result in only negligible differences than those currently occurring. Fine particulate matter from road dust would combine with other particulates produced during implementation of Forest projects such as prescribed burning and harvest operations. Implementation of projects off-Forest (i.e. state, private, BLM lands) such as prescribed burns, harvest and mining operations, and travel on native surface roads would also contribute particles.

There is no data to support predictions of the amount of particulates contributed by all of these other sources. In addition, past impacts to air quality are not usually evident. Motorized travel emissions would only be combined with other localized sources. Due to low traffic volume, these emissions are fairly low across the Gila National Forest and disperse rather quickly. Actual cumulative effects would be relatively minor and should show little change in any alternative from existing condition. Depending on timing with other projects, some combinations of fugitive dust from motorized routes and other particulates in the air could contribute to further reduce visibility for short time periods within the Gila Wilderness Class I airshed. Emissions produced by motorized vehicles in use across the Forest would continue to contribute to greenhouse gases, as under current conditions.

Irreversible and/or Irretrievable Commitment of Resource

There would be no irreversible or irretrievable impacts to air resources with implementation of any of the action alternatives. Air quality would remain comparable to existing conditions.

Conclusions about Alternative Effects

In summary, Alternative E, unilaterally, indicates largest decrease in potential direct, indirect and cumulative effects to air quality from No Action. Alternative D has second largest decrease in potential effects to air quality across the board; with exception of Alternative F in the Lower Colorado

River Airshed (this is notable as 81% of the Gila NF is in the Lower Colorado River Airshed). Alternatives F & G are mostly similar (within 1%), with the exception of the Lower Colorado River Airshed, where Alternatives D and F are more similar (within 1%) and Alternative G trails. Alternative C indicates the least amount of decrease in potential effects to air quality from No Action, with potential acres in Southwestern Closed airshed increasing by 2%. This alternative poses little change from No Action.

The Gila National Forest is meeting New Mexico Air Quality Standards and meeting Forest Plan standards and guidelines under the No Action Alternative, and would continue to meet all laws, regulations, and policies with implementation of any of the action alternatives.

Best Available Science

This evaluation was developed in consideration of the best available science and is consistent with the Gila National Forest Land and Resource Management Plan, as amended. It includes use of current (web-posted) data and reports available from various state and federal government agencies including: New Mexico Environment Department; U.S. Environmental Protection Agency; Forest Service directives (manuals and handbooks); current and past inventory, monitoring, and administrative information; and use of current literature endorsed by the Southwestern Region Forest Service. A list of references is available, with websites as available.

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