Proposed Amendments to California's Agricultural Burning Guidelines

Staff Report

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California Environmental Protection Agency

Air Resources Board

Planning and Technical Support Division

PROPOSED REGULATION ORDER

California Environmental Protection Agency
AIR RESOURCES BOARD
Planning and Technical Support Division

Initial Statement of Reasons for Rulemaking

Public Hearing to Consider Amendments to the Agricultural Burning Guidelines

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INITIAL STATEMENT OF REASONS FOR RULEMAKING

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EXECUTIVE SUMMARY

California's existing smoke management programs can be improved through increased coordination by the federal, State, and local air agencies responsible for air quality, prescribed burning, and fire safety. State law gives the Air Resources Board (ARB) the responsibility to adopt statewide regulations to govern agricultural burning, including the prescribed burning of wildlands and rangelands. California's existing 1987 Agricultural Burning Guidelines need to be updated to improve interagency coordination, ensure use of real-time meteorological data to avoid smoke episodes, and refine program design to provide adequate opportunity for necessary open burning while protecting public health and air quality. Burn opportunities are needed for purposes such as public safety, wildfire prevention, forest health, ecological concerns, economic need, and disease and pest prevention.

At present, smoke management efforts in California are generally successful at avoiding smoke impacts to people. The challenge is to ensure that infrequent but serious smoke episodes do not continue to occur. Additional efforts are also needed to address expected parallel increases in prescribed burning and population growth, especially in rural areas. The combination of these two phenomena makes it critical that California's smoke management program be as technically sound and effective as possible.

California's smoke management program is implemented by local air pollution control and air quality management districts (air districts), in concert with ARB and burners (primarily other agencies and agriculture). In terms of prescribed burning, federal agencies include the U.S. Forest Service, U.S. Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, U.S. Bureau of Indian Affairs, and the military. State agencies include the California Department of Forestry, California Department of Parks and Recreation, and California Department of Fish and Game. The forestry and timber industry also conducts burns.

About 200,000 acres were treated in 1998 in California using prescribed burning. The U.S. Forest Service, the largest burner, treated about 80,000 acres. Next was the California Department of Forestry which burned 40,000 acres. Future projections made by burners would increase the total to about 340,000 acres in 2003, most of the increase by the U.S. Forest Service. Over the last year, the U.S. Forest Service has worked with ARB to develop an agreement that would help address past problems and accommodate expected increases. The concepts in this agreement serve as the foundation for proposed amendments regarding prescribed burning.

The crop waste component of the proposed revisions reflects longstanding agricultural burning programs, such as the Sacramento Valley Burn Program, which has greatly reduced smoke impacts from crop waste burning. Approximately 1.6 million acres of crop waste (e.g., rice and wheat straw), related agricultural waste, and orchard and vineyard prunings were burned in 1998. In contrast to prescribed burning, crop related waste burning is expected to decline somewhat as a result of the rice straw

burning phase-down in State law and the potential for increased use of biomass for fuel or other uses.

Under the existing regulations, the air districts play the lead role in making daily decisions for specific burns. These decisions should involve the timing, location, and amount of burning that can be authorized without an adverse public health or air quality impact. The proposed Guidelines require the air districts to have a daily burn authorization system that addresses each of these considerations. While State law requires that ARB make a burn or no burn day call for each air basin statewide, the air districts can further refine an ARB's burn day call on a local basis.

The proposed regulation would clarify that districts can work with ARB to develop a procedure to allow a district to use its own analysis of expected meteorological conditions for burn day calls. Some air districts already do it. In the case of a no burn day call by ARB for an air basin, the air districts could propose a more refined call (e.g., a marginal or burn day for all or limited parts of the air basin) based on their own analysis. With ARB's concurrence, a no burn call could be adjusted or refined for that air basin.

To help maximize the amount of burning that can take place while still avoiding smoke impacts, we are proposing a new concept – marginal burn days. The proposed regulation would allow ARB to designate each day as either a burn day, a no burn day, or a marginal day for each air basin. The concept of a marginal day designation would enable districts to allow limited amounts of burning in specified areas (e.g., a small portion of an air basin) when the burning will not cause or contribute to air quality problems. This should increase burn opportunities without a public health impact.

A key new proposal in terms of avoiding public health and air quality impacts is the requirement for smoke management plans by prescribed burners. Basic information on burn location, types and amounts of material to be burned, and location of smoke sensitive areas are required for burns greater than 10 acres. More comprehensive plans are required for the largest burns (greater than 100 acres) including projections of where smoke is expected to travel and contingency actions such as fire suppression or containment to be taken if weather changes or unanticipated smoke impacts occur. The other key concept is that of accountability—burners would need to comply with their smoke management plans including making a decision not to ignite a fire if the conditions specified in the plan are not met on the day of the burn.

Finally, all burners subject to a district's smoke management program would be required to have district authorization to burn on a particular day. The air district's could tailor their program to adopt appropriate authorization mechanisms.

A number of issues have been raised throughout the development of the proposed regulation. These are discussed in the report. The costs of an enhanced program, the need to continue burning for a number of reasons, the timeframe for implementation, the ARB's role in terms of oversight, the desire of some districts for

more delegation, and the potential for alternatives to burning were all discussed in the 15 workshops and in numerous written comments. We have revised the proposal substantially over the last several months to address many of the concerns raised. The proposed regulation is designed to ensure that, where necessary, air districts and burners improve their smoke management efforts and work more closely together. This should allow necessary crop and prescribed burning to continue while protecting the public from smoke and air quality impacts.

As there are new requirements associated with the proposed Guidelines, there are increased costs on State and local air and fire management agencies and the private sector. These costs are described in the Staff Report. We are committed to seeking ways to reduce the overall cost of the program by encouraging close cooperation between all stakeholders and developing computer-based systems to help track prescribed burns in the State. In addition, we are committed to working with the air districts to find ways to fully fund their costs to implement the smoke management program.

I. INTRODUCTION

The Air Resources Board (ARB or Board) is proposing amendments to California's Agricultural Burning Guidelines. The Agricultural Burning Guidelines were established in 1971 in response to statewide legislation in 1970 that recognized the need to reduce the harmful health effects caused by smoke from unrestrained open burning of vegetative material on public and private lands.

At present, smoke management efforts in California are generally successful at avoiding smoke impacts to people. The challenge is to ensure that infrequent but serious smoke episodes do not continue to occur. Additional efforts are also needed to address expected parallel increases in prescribed burning and population growth, especially in rural areas. The combination of these two phenomena makes it critical that California's smoke management program be as technically sound and effective as possible.

In response to these challenges and to facilitate stronger partnerships among air agencies and the agricultural and forest burning communities, we are proposing revisions to the Agricultural Burning Guidelines. One of the changes involves modifying the title to Smoke Management Guidelines for Agricultural and Prescribed Burning (Guidelines). The changes were tailored after the successful multi-district or regional approach used in the Sacramento Valley, where nine air districts coordinate the management of agricultural burning operations. Also influencing our revisions were those smoke management programs implemented in air basins in the Northern portion of the State that work with commercial timber interests and public lands managers.

What is agricultural burning and how is it distinguished from prescribed burning?

Section 39011 of the Health and Safety Code defines agricultural burning. Generally speaking, agricultural burning refers to the intentional use of fire for waste removal of vegetation, disease and pest prevention, forest operations, and range improvement – in areas such as agricultural fields, orchards, and wildlands.

Agricultural burning includes "prescribed burning," which consists of fires intentionally ignited to meet specific land management objectives (e.g., to reduce flammable fuels, such as the accumulation of brush, logs, etc. on forest floors; or to help restore ecosystem health and habitat). Thus, prescribed burning is a subset of agricultural burning. Throughout this staff report and the proposed amendments, we will explicitly identify provisions that apply to prescribed burning.

What are the objectives of the proposed Guidelines?

The proposed Guidelines are intended to achieve the following objectives:

- Minimize or prevent smoke impacts to protect public health and welfare, including visibility;

- Establish a collaborative approach among air agencies and burners that increases the effectiveness of the smoke management program;

- Provide increased opportunities for managed burning both on federal lands to reduce fuel loads and potentially catastrophic wildfires, and on agricultural lands to allow crop waste to be removed without adverse air quality impacts; and

- Encourage the development and use of alternatives to prescribed burning for disposing of, or reducing, the amount of forest fuels on public lands when economically feasible and ecologically advisable.

What would the proposed Guidelines do?

The proposed Guidelines would not change what burning is done, but may change the timing, location, and amounts of vegetative burning that is authorized on any particular day. The proposed Guidelines place primary emphasis on smoke management through improved planning, collaboration, and consultation between burners and air agencies.

The proposed Guidelines contain three new basic provisions: requirements for a "burn authorization system"; requirements for a "smoke management plan"; and provisions for the use of a "marginal" burn day.

Under, the first provision, the air districts now have to review and, if necessary, revise their daily "burn authorization systems." These systems describe how they will collect meteorological and pollutant information, what staff resources will be used, and other procedures to operate the program. The air districts will have to develop programs to make decisions on a daily basis of how much burning to allow, and where and when it should be allowed. The amount of burning allowed each day should be consistent with meteorological conditions and pollution levels on that day. On windier days and those with good vertical mixing, more burning can be allowed as those conditions will disperse smoke. On more polluted days, less burning or no burning should be allowed since the atmosphere is already polluted.

The second basic provision applies only to prescribed burning. "Smoke management plans" will have to be prepared by prescribed burners for each burn. The plans must then be reviewed and approved by the air district before burns can be done. The plans will contain information about the amount of material to be burned, how long the burn would be expected to take, and where the smoke from the burn would be expected to travel under the meteorological conditions desired for burning. Where larger burns are proposed, the plan must contain a discussion of alternatives to burning. Contingency plans will be included, describing actions that would be taken if meteorological conditions change or smoke impacts occur.

For the third provision, we have added the concept of a "marginal" burn day. On a marginal burn day, some limited burning in specified areas may be authorized on days

when limited amounts of burning would not cause or contribute to air quality problems. This provision should increase burn opportunities without a public health impact.

The proposed Guidelines also allow flexibility to the air districts to develop programs that are consistent with the air quality problems caused by burning in their areas and include exemptions under certain circumstances.

The complete text of the regulation is presented in Appendix A. A detailed discussion is presented in Chapter VI.

What process was used to develop the proposed Guidelines?

In developing the proposed Guidelines, we used a broad-based public outreach program to develop a comprehensive statewide approach to smoke management that also allows program flexibility at the local level. This outreach consisted of numerous program scoping sessions, public workshops, and individual stakeholder meetings that were held throughout the State.

The Board held three scoping sessions and 14 workshops in 1999 and one workshop in 2000. In total, over 500 persons attended these meetings. In addition, the Board held 23 separate meetings and conference calls with affected groups including air districts, federal and state land managers, farmers, foresters, and conservation groups. In addition, we received and considered over 100 written and e-mail comments on the proposed amendments.

II. NEED FOR PROPOSED GUIDELINES

The ARB is proposing changes to the Guidelines for several reasons:

- Improvements are needed to the existing Guidelines to allow California to meet health-based air quality standards and federal visibility requirements.

Emissions from agricultural burning, including prescribed burning, have the potential to significantly affect air quality and public health. More than 200 chemicals and compounds are found in smoke. Annually, vegetative burning emits thousands of tons of carbon dioxide, oxides of nitrogen, and a variety of toxic hydrocarbons and other cancer-causing organic compounds, condensed into inhalable airborne particles or particulate matter.

While air quality in California is improving, 14 of California's 15 air basins continue to violate the State PM_{10} standards, and the Sacramento Valley Air Basin violates the 24-hour standard by a considerable number of days.

Smoke from prescribed burning or wildfires can sometimes result in high ambient particle levels for several hours. While the duration of these episodes may not be long enough to cause a violation of the 24-hour standard, they nonetheless can be sufficient to affect the health of sensitive individuals, e.g., the elderly, children, and asthmatics.

- Federal and State land managers need to continue and are expected to increase prescribed burning in California to reduce excess vegetative fuel loadings that heighten the risk of catastrophic wildfires.

Because of the accumulation of vegetative materials on forest lands, incidents of large wildfires have become a more frequent occurrence. In order to restore the natural cycle of low intensity fire on these fire-dependent lands for ecological reasons, FLMs plan to increase the number of acres burned in our national forests and wildlands. While fuels management is beneficial for the overall life and health of forest lands, it must be carefully timed and planned so as to reduce the potential impact on public health and air quality. The proposed Guidelines would require prescribed burners to work more closely with the ARB and air districts to avoid burning on days that could pose adverse health impacts from smoke to an affected population.

- Severe smoke episodes that occurred from prescribed burning over the past two years could have been avoided with an approach that relies upon closer communication and collaboration between State and air districts and prescribed burners.

In some instances, poor communication between FLMs and the State and air districts have contributed to inappropriate burn decisions when weather conditions were unfavorable for smoke dispersion. These fires have caused short-term, high-impact smoke episodes in downwind communities that might otherwise have been avoided or

mitigated. As more people move into rural areas, there will be increasing need to manage prescribed burning activities on neighboring public lands (wildland/urban interface areas) to avoid public health impacts. The proposed Guidelines would require burners to engage with air districts and the ARB in an enhanced coordination and consultation process from the initial planning and scheduling phase through the post-burn evaluation.

The proposed Guidelines are needed to ensure that public health and air quality standards are taken into account in the face of expected increases in prescribed burning. The State is also required under federal law to address all identified sources of visibility impairment, including fires. The proposed Guidelines will form a part of our response to these requirements.

III. LEGISLATION AND HISTORY OF CALIFORNIA'S AGRICULTURAL BURNING GUIDELINES

Assembly Bill (AB) 16 (Ketchum), Chapter 1579 of the Statutes of 1970, directed the ARB to establish guidelines for the control and regulation of agricultural burning by the air districts in California. Originally, agricultural burning was defined as open outdoor fires used in agricultural operations in the growing of crops or raising of fowl or animals. In 1971, pursuant to AB 16, the ARB established Agricultural Burning Guidelines for six of the State's 11 air basins for the burning of waste produced during agricultural operations (these Agricultural Burning Guidelines can be found in sections 80100 *et seq.* of Title 17 of the California Code of Regulations).

In 1972, the Agricultural Burning Guidelines were amended to apply to all air basins in California and also to establish burn requirements for forest management and range improvement operations. Since then, the Agricultural Burning Guidelines have been modified many times. Major changes include amending the definition of agricultural burning to include open burning for the improvement of wildlife and game habitat and again for wildland vegetation management. The Agricultural Burning Guidelines were also amended to improve the quality of data reported by air districts and to improve management of smoke from rice straw burning in the Sacramento Valley (the Sacramento Valley Basinwide Agricultural Burning Plan).

Agricultural burning in the Sacramento Valley was regulated from 1971 to the fall of 1981, using the simple burn/no-burn control program similar to that used in the rest of the State. However, beginning in 1981, a unique, variable-acreage burning program was developed and tested in the Sacramento Valley; this program became part of the Agricultural Burning Guidelines in 1983. The Sacramento Valley Agricultural Burning Plan, as mandated in the Guidelines, specifies when, where, and how agricultural burning – including rice straw – is to be performed. There have been no substantial amendments to the Guidelines since 1987, when provisions to regulate wildland vegetation management burning were adopted.

IV. AIR QUALITY AND PUBLIC HEALTH

The warm weather and geographic features that make California such an attractive place to visit and live also contribute to the State's air quality problems – California records some of the highest levels of ozone and particulate matter in the country. Nearly all Californians live in areas that violate one or more health-based air quality standards established by the State or federal government.

Emissions from agricultural burning and prescribed fire have the potential to significantly impact air quality and public health. Smoke contains many potentially harmful air pollutants. More than 200 chemicals and compounds can be found in smoke, including carbon dioxide, oxides of nitrogen, a variety of toxic hydrocarbons and other organic compounds in the form of particulate matter. In addition, emissions from vegetative burning include large amounts of particulate matter.

The Effects of Smoke on Particulate Matter in California

Particulate matter is a complex mix of pollutants such as smoke, dust, nitrates, sulfates, and metals. Particles can be directly emitted from sources like vehicles, fires, and dust from roads or can be formed in the atmosphere by the reaction of chemical precursors, like oxides of nitrogen and ammonia. Incomplete combustion from agricultural, including prescribed, burning, generally form fine particles, while mechanically formed particles such as dust tend to be larger.

The season for high particle levels and the dominant pollution sources vary across the State. In much of northern and central California, levels of both fine particulate matter ($PM_{2.5}$) and PM_{10} are lower in spring and summer, higher in fall and winter. In Figure 1, this seasonal variation is displayed for the Sacramento Valley based on the five most recent years of air quality data (1994-1998). Because particle levels can be high during the fall months when a significant amount of burning occurs, it is important to manage smoke from burning activities as effectively as possible.

Figure 1. Seasonal Variations of Particulate Matter in Sacramento (1994-1998)

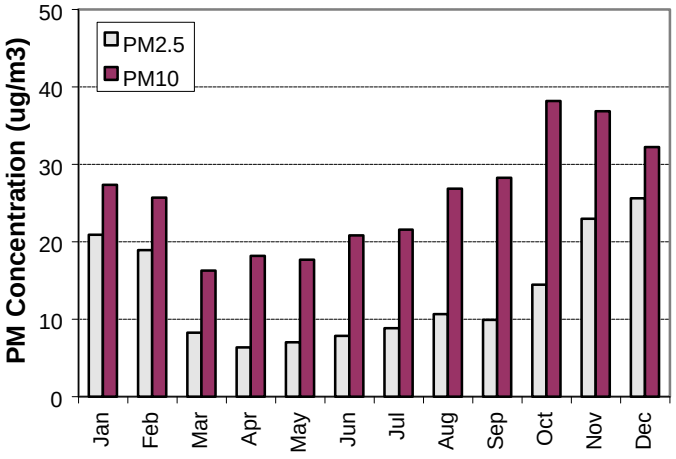


Table 1 shows the maximum 24-hour PM_{10} concentrations for California's 15 air basins for 1996-1998. Since the State's 24-hour PM_{10} standard is 50 $\mu g/m^3$, the table shows that 14 of California's 15 air basins violate the State PM_{10} standard, most by a considerable amount. U.S. EPA's 1999 promulgation of new federal air quality standards for fine particles less than 2.5 microns in diameter ($PM_{2.5}$) focused additional attention on the need to reduce emissions of particulate matter and particulate matter precursors.[1]

Table 1. PM10 – Maximum 24-Hour Concentrations ($\mu g/m^3$) and Number of Calculated Days Above the State PM_{10} Standard*

Air Basin	1996		1997		1998	
	Max. 24-hr. Std.	Days Above Std.	Max. 24-hr. Std.	Days Above Std.	Max. 24-hr. Std.	Days Above Std.
Great Basin Valleys[2]	397	21	402	36	1116	78
Lake County	26	0	18	0	35	0
Lake Tahoe	72	24	55	12	59	12
Mojave Desert[3]	138	24	130	18	165	18
Mountain Counties	114	18	138	66	92	24
North Central Coast	115	72	113	72	76	24
North Coast	87	9	66	6	50	0
Northeast Plateau	188	12	97	18	66	12
Sacramento Valley[4]	98	42	126	24	130	60
Salton Sea[5]	441	246	532	294	563	264
San Diego	93	90	125	126	89	108
San Francisco Bay Area	76	12	95	18	92	18
San Joaquin Valley[6]	153	204	199	108	160	114
South Central Coast	98	78	321	48	110	48
South Coast[7]	162	255	227	246	116	186

*Calculated number of days takes into account the sampling frequency of air monitoring.

[1] On May 14, 1999, a three-judge panel of the U.S. Court of Appeals for the District of Columbia remanded, or returned, the new ozone and $PM_{2.5}$ standards to U.S. EPA to provide a better rationale for how it selected the particular levels of the standards. Although the standards remain in place, the court has prohibited U.S. EPA from implementing them. The U.S. EPA has appealed the ruling and intends to ask the U.S. Supreme Court to review the decision.

[2] Only the Mono, Mammoth Lakes, Owens Valley, and Searles Valley portions of the air basin are nonattainment.

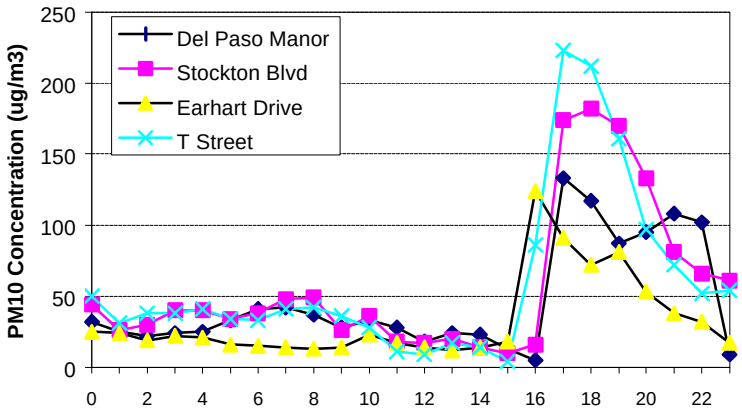
[3] Only the San Bernardino County and Searles Valley portion of the air basin is nonattainment although air quality in both areas currently meets the federal standard.

[4] Only Sacramento County is designated nonattainment. Recorded ambient levels currently show no exceedances of the federal standard. The air district has submitted a request to U.S. EPA to correct its designation status to attainment because the data upon which the nonattainment designation was made were subsequently invalidated.

[5] The Imperial Valley and Coachella Valley portions of the air basin are designated as nonattainment. Coachella Valley currently shows no exceedances of the federal standard. A redesignation request and maintenance plan for the Valley is now pending with U.S. EPA.

[6] Entire basin is non-attainment.

Figure 2: Hourly PM10 Levels in Sacramento on November 1, 1994



Smoke from planned or unplanned fires can sometimes result in short-term (several hour) episodes of high particle levels. In some cases, these episodes do not cause violations of the 24-hour particulate matter standards but very high hourly levels cause people to complain about the smoke affecting them.

The Sacramento Valley Plan is currently the most comprehensive smoke management program in the State for the management of crop waste, and is generally successful in preventing acute smoke incidences from occurring in urban areas. However, even with a successful program such as Sacramento Valley's, occasional problems can still occur. The November 1, 1994 smoke episode in the Sacramento Valley (see Figure 2 below), while extremely uncommon and infrequent, is useful to illustrate the climb of peak concentrations of particulate matter over 24 hours.

Although these short-term episodes may not trigger violations of particulate matter air quality standards, they are nonetheless a public health concern. Through more effective smoke management practices statewide, we hope to prevent the occurrence of such short-term smoke episodes.

Health Effects of Smoke

The practice of open-field burning of crop waste, forest materials and other plant residues releases large quantities of smoke particles and gases into the air. These airborne pollutants can be harmful to people. Smoke exposure has been associated with adverse health effects particularly among those with respiratory and cardiovascular illness.[7]

[7] Liu, D.; Tager, I.B.; Balmes, J.B.; Harrison, R.J. 1992. The effect of smoke inhalation on lung function and airway responsiveness in wildland fire fighters. Am.Rev. Respir. Dis. 146:1469-1473.

The key components of smoke that are of health concern include directly emitted particles, particles formed from emitted materials, and gaseous, vapor-phase materials.

There is a great deal of information on how the constituents of smoke can worsen existing illnesses. Smoke of all kinds, including rice straw smoke, contains inhalable particulate matter. More than 200 individual health studies on the impacts of particulate matter on public health were cited in the United States Environmental Protection Agency's document supporting the change in the particulate matter ambient air quality standard. A bibliography of these studies is available on request.

Most of the particles directly emitted from agricultural burning are less than 10 microns in size.[8] These particles are small enough to be inhaled and can be especially harmful to people with existing vascular or respiratory illness, the aged, and the very young. Exposure to such particles may worsen existing disease conditions. They can produce symptoms ranging from breathing difficulties to increased respiratory infections and even death. Observations of a clear association between ambient fine particle levels and these adverse health effects have been reported in numerous studies performed in cities across the nation and around the world. These reports form the basis of State and federal ambient air quality standards for particulate matter.

The findings in recently published literature have focused on the health consequences of PM_{10} and smaller size fractions. These studies indicate that when particle levels increase, health effects increase as well. For example, when 24-hour PM_{10} values increase by 50 micrograms per cubic meter (ug/m^3) above a base value, total daily mortality rates increase by approximately one extra death per million people. Most of these deaths occur two or three days following the episode. More than half of these deaths occur in people over 65 years of age. Most deaths are due to cardiovascular and respiratory causes. Should high ambient concentrations persist for several days, mortality increases during this period may be as high as 1.5 deaths per day, per million people. Hospital admission rates have also been found to increase with increases in PM_{10} and $PM_{2.5}$ levels.

Particles directly emitted from combustion of vegetative materials and waste products include soil material entrained in the smoke plume and products from the combustion of the vegetation itself. Soil particles are fairly large in size, mostly in the fraction above $PM_{2.5}$. The directly emitted combustion particles include partially burned residues that may be quite large, but they may also include substantial amounts of small particles. The smaller particles can be largely composed of the organic remains of incomplete combustion of the vegetation.

Particles originating from the gaseous products of combustion are a result of condensation and chemical processes. Complex organic compounds are formed in this

[8] Atmospheric Pollutant Emission Factors From Open Burning of Agricultural and Forest Biomass by Wind Tunnel Simulations, ARB Contract No. A932-126, April 1996, B. M. Jenkins, Principal Investigator

process, along with some sulfates and nitrates. Known and suspected human carcinogens have also been found in these particles.[9]

Vapor or gas phase materials are also released in large quantities by open-field crop waste combustion, such as rice straw. The list of components is very large, but the dominant ones include carbon monoxide, carbon dioxide, nitrogen dioxide, sulfur dioxide, and numerous organic substances. The extent to which these materials impact ambient air quality is not well studied, but most are harmful to health when present at elevated levels. Some of the organic vapors are precursors to the formation of ozone.

The ARB is sponsoring controlled clinical studies to look at the specific health effects of burning rice straw and other agricultural waste.[10] These studies include exposing human volunteers to controlled, quantified levels of smoke from burning rice straw and other vegetative materials. Subjects have been recruited from the general population as well as from groups that are likely to be sensitive to smoke, such as asthmatics and people with allergies. Lung function changes and other health effects following brief, multi-hour exposure periods to varying levels of smoke are being examined. Studies such as this will provide information critical to establishing how and to what extent smoke from these sources and other vegetative burning directly impacts human health.

[9] Jenkins, opt cite

[10] *The Effects of Smoke from Burning Vegetative Residues on Airway Inflammation and Pulmonary Function in Healthy, Asthmatic and Allergic Individuals*, ARB Contract No. 97-322

V. BURNING ESTIMATES AND ALTERNATIVE TREATMENTS TO BURNING

This chapter provides information on acres burned in California from removal of crop waste, prescribed burning and wildfires. The chapter also summarizes the array of alternative treatments in addition to burning that wildland owners use to remove vegetation.

Burning Estimates

The values included in this chapter were obtained from yearly air district agricultural burning reports, communications with the air districts, air district permit records, workshop comments, communications with other government agencies and private landowners, and comment letters submitted to the ARB during the course of rule development. While we have attempted to break out the acres burned into either crop waste or prescribed burning, there is likely some overlap between the two categories.

1. Crop Waste

Approximately 1.6 million acres of crop and other related agricultural waste (e.g., rice and wheat straw), and orchard and vineyard prunings were burned in California in 1998. There is no indication from air districts contacted that there are significant changes in crop waste burning practices or levels predicted for the future. The one exception is rice straw burning in the Sacramento Valley, which is subject to the Connelly-Areias-Chandler Rice Straw Burning Reduction Act of 1991 (the “Phase Down”), as subsequently amended by Senate Bill 318.

This Phase Down limits the amount of rice straw that may be burned in the Sacramento Valley Air Basin by requiring that the percent of acres burned decrease on a yearly basis. This reduction began in 1992 (when 90 percent of planted acres could be burned); the final phase down is scheduled for 2001. By that time, the total acres that may be burned will drop to 125,000 acres or 25 percent of the total acres planted, whichever is less – and only under specified conditions for disease control. This will likely result in a decrease in the acreage burned in the Sacramento Valley Air Basin. In 1998, 153,774 acres of rice straw were burned in the Sacramento Valley Air Basin.

Table 2 shows our best estimate of acres burned in California based on air district reporting and follow-up communication. Some air districts include prescribed burning activities in their reports while others do not. However, the majority of the data reported appear to be primarily crop waste and related agricultural waste burning.

Table 2. 1998 Agricultural Burning Estimate*

Air District or Air Basin	Estimated Acres Burned
Bay Area AQMD	7,544
Great Basin Unified APCD	1,121
Imperial County APCD	267,000
Lake County AQMD	21,496
Lake Tahoe Air Basin	813
Mohave Desert AQMD	38,735
Monterey Bay Unified APCD	35,126
Mountain Counties Air Basin	18,236
North Coast Unified AQMD	11,977
Northern Sonoma County APCD	5,394
Sacramento Valley Air Basin	441,785
San Joaquin Valley Unified APCD	745,094
San Luis Obispo County APCD	12,900
South Coast AQMD	7,841
Ventura County APCD	15,800
TOTAL	**1,630,862**

**Based on data received from reporting air districts.*

2. Prescribed Burning

About 208,000 acres were treated in California in 1998 using prescribed burning, which was conducted by federal and State land management agencies, the United States military, the CDF, and timber companies (see Table 3). While industry and some government agencies proposed to maintain 1998 levels through 2003, some federal agencies, notably the USFS and the BLM, indicated a substantial increase in prescribed burning over the same time period.

The Bureau of Land Management (BLM) burned 15,000 acres in 1998, and plans to increase this to 45,000 acres by 2003. The USFS burned about 80,000 acres in California in 1998. The agency has plans to increase these treatments to 220,000 acres by the year 2003, with 158,000 acres treated using prescribed burning and the remainder treated using mechanical means. However, this anticipated increase may be limited by budgetary constraints.

Table 3. California Prescribed Burning*
Actual and Projected Estimates (1998 and 2003)

Agency	Acres Burned 1998	Acres Projected 2003
U.S. Forest Service	80,000	158,000
California Dept. of Forestry	40,000	40,000
U.S. Bureau of Land Management (BLM)	15,000	45,000
U.S. Army – Fort Hunter-Liggett	14,000	23,000
National Park Service	13,000	19,000
U.S. Army – Camp Roberts	10,000	10,000
U.S. Fish and Wildlife Service	9,029	9,029
California Department of Parks and Recreation	2,150	5,500
California Department of Fish and Game	800	2,000
U.S. Army – Presidio of Monterey (Fort Ord)	225	200-800 (500 used in total below)
U.S. Air Force – Vandenberg Air Force Base	110	2,000
U.S. Bureau of Indian Affairs	100	2,000
Industry		
Forestry/timber industry	24,000	24,000
Total	**208,414**	**340,029**

* Communications with USFS, April 7, 1999, May 17, 1999, and June 10, 1999, and June 28, 1999 (letter from Mr. Ray Quintanar to Mr. Terry McGuire); CDF, August 20, 1999; BLM, April 7, 1999; U.S. Army – Fort Hunter-Liggett, August 18, 1999; National Park Service, August 10, 1999.; U.S. Army – Camp Roberts, August 19, 1999; California Department of Parks and Recreation, August 16, 1999; California Department of Fish and Game, August 18, 1999; U.S. Army – Presidio of Monterey (Fort Ord), August 25, 1999; U.S. Air Force – Vandenberg Air Force Base, August 17, 1999; U.S. Bureau of Indian Affairs, August 13, 1999; U.S. Fish and Wildlife Service, October 7, 1999; Paul Violett, Soper-Wheeler, November 2, 1999.

Most of the remainder of prescribed burners are expected to see increases in acres burned, but burning by the federal land management agencies dwarfs the total amount.

Prescribed burning by the CDF is conducted under their Vegetation Management Program. Under this program, about 40,000 acres per year are burned. While CDF would like to increase the areas treated by prescribed fire, they are limited by their funding and do not predict dramatic increases in the near future.

Private burners estimate that they burned approximately 24,000 acres in 1998 under their prescribed burning program. They do not expect that number to change significantly in the next five years.

It should be noted that “acreage burned” does not offer a good basis for comparing emissions from crop waste and forest and wildlands. This is because the emissions produced from open burning are dependent upon a variety of factors, such as

the quantity of fuel available for burning, the moisture in the fuel, the type of fuel, how the fuel is configured, how much of the fuel actually burns, and how quickly it burns. For example, burning wheat straw stubble is estimated to produce about 22 pounds of PM_{10} per acre. However, performing prescribed burning of Southern California chaparral is estimated to produce from 140 to 462 pounds of PM_{10} per acre, depending on the amount of material burned. Therefore, the acreage values should not be directly used to make judgments about which practices produce the highest emissions.

3. Wildfires

California wildlands are at high risk of catastrophic wildfires. As indicated in Table 4, preliminary numbers from 1999 indicate that wildland fires burned three times as many acres as in 1998. The five-year average between 1993 and 1997 for acres burned from wildfires is 320,850 acres. In contrast, far fewer acres were managed as prescribed fires in 1999 as in 1998. This disparity suggests a substantial diversion of fire-fighting resources to controlling wildfires instead of conducting prescribed burning. It also suggests a far greater smoke impact from wildfires on surrounding populations, probably significant ecological damage, and substantial dollars expended in fire-fighting resources and lost property.

Table 4. Estimates of Acres Burned in California from Prescribed Burning and Wildfires by State and Federal Land Managers

	1998	1999	5 Year Average (1993-1997)
Wildfires	215,412	731,163	320,850
Prescribed Burning	208,414	90,000	*

*Annual reporting data by federal land managers was not available prior to 1998; the 5 year average for prescribed burning by CDF over the 5 year period was about 34,000 acres.

The increasing threat of uncontrollable, catastrophic wildfires makes it incumbent that we act in concert with federal land managers to reduce the over-accumulation of vegetative fuels. While these conditions jeopardize the sustainability of forest resources, they also increasingly threaten human health, lives and property in nearby communities. Air districts will be required to develop smoke management programs that consider the need to reintroduce fire or other fuel reduction treatments into frequent-fire forests, protect public health, and meet air quality standards.

Alternatives to Prescribed Burning

Several factors should be considered when selecting appropriate treatments for treating crop waste and vegetation. These factors include not only safety, cost of treatment, and resource benefits, but also public health protection. The best combination of treatments are those that meet management goals with the most favorable impacts.

Prescribed fire may not always be the most appropriate tool to use to reduce or manage fire hazards. Major constraints to the sole use of prescribed fire include the high fuel load levels found in our national forests and in many urban/wildland regions. These conditions can sustain escaped flames and result in damaging wildfires -- and the greater production of air pollutants, especially particulate matter, associated with burning increased quantities of fuel. Consideration of alternative fuel treatment methods in lieu of or in combination with prescribed fire is therefore certainly warranted.

Wildland owners and managers have an array of tools, including fire, which can be used to achieve land use objectives, depending on the resource benefits to be derived. Other sections in this report describe the importance that re-introduction of fire provides to the overall ecological health of forestlands and prevention of crop disease and pest infestation of agricultural lands. This section describes some of the alternative tools that are also available to growers and land managers in the disposal or removal of agricultural waste and excess vegetative materials.

Typical alternative fuel management methods currently used in California include biomass chipping, crushing, disking, mowing, selective logging, chemical treatment and livestock grazing. Fuel management methods can be classified within two categories: utilization and disposal. If biomass is considered a raw material instead of a disposal problem, it may be possible to produce a valuable product while offsetting costs of fuel reduction.

The most promising potential use for biomass material is in industries that use wood products in a form that is least sensitive to raw material specifications and process modifications. Products such as biomass-produced electricity and compost have the greatest utilization potential. Conversion to other fuels such as ethanol also has a promising outlook.

California biomass facilities, in aggregate, result in an overall reduction in the emissions of some pollutants. The ARB believes that the biomass industry can play a role as one of several disposal alternatives, including the open burning of agricultural waste[11]. The most prominent benefit is in the reduction of particulate matter from the open burning of agricultural and forest wastes. To the extent that there is a planned increase in the use of prescribed fires on federal, State, and private forest lands, the benefits provided by the biomass industry as an alternative to prescribed fire would be further amplified. Federal air quality standards for particulate matter may also elevate the importance of biomass utilization as a disposal/removal tool. However, biomass utilization for electric generation also has air quality implications associated with localized stationary sources operations that emit pollutants year round and not just on burn days. Air districts would need to take emissions from such operations into account when weighing the options.

[11] Report on AB1890 (Chapter 854, Statutes of 1996), "Cost Shifting Strategies for the Benefits Attributable to the solid Fuel Biomass Industry," *Appendix C, Air Quality Impacts of the Biomass Energy Industry (California Air Resources Board).*

With regard to brush management in rangelands, two widely used approaches are mechanical treatment and the application of herbicides. Economics and environmental concerns with these brush control methods have led to the emergence of prescribed fire as an integral part of vegetation management. However, interest in using biological brush management (such as sheep) is also growing. Even though selective grazing by livestock has contributed to the increase in undesirable plants on rangelands, knowledge of the foraging process, when properly used, can enhance range condition by manipulating vegetation.

In the past, disposal was often considered the most cost-effective method of dealing with biomass. The various methods practiced include landfill disposal, soil incorporation at the source, or combustion either in the open or in an incineration unit. The chief disadvantage of disposal is that the raw material potential is lost. Also, with changing rules, regulations, and costs associated with these activities, disposal may not be the best option.

When the management objective is to preclude, reduce or remove live vegetation and/or specific plant species from a site, chemical treatments may be appropriate tools. Other potential environmental impacts caused by applying chemicals must also be considered, however.

All these potential uses should be examined closely by both land managers and air districts when reviewing the proposed burn plan and smoke management components. This review should occur at both the initial project design stage as well as prior to air district approval of the burn permit. The ARB intends to participate more actively in several related venues in this regard, including the review and comment of Environmental Impact Statements for national forest lands, biomass conversion demonstration projects, and technology assessments for the control of emissions from biomass processing plants.

Environmental attributes of alternatives to prescribed burning should be carefully evaluated when making fuel management decisions. In addition to excess emissions from uncontrolled point source biomass operations, alternative treatments can have significant effects on nutrient cycling regimes, hydrology of forested watersheds, forest stand health, wildlife, and propagation of noxious weeds.

VI. BASIS AND RATIONALE FOR THE PROPOSED AMENDMENTS

In this chapter, we provide a plain English discussion of the staff's proposed changes to the Guidelines. The discussion in this chapter is intended to satisfy the requirements of Government Code section 11346.2(a)(1), which requires that a non-controlling "plain English" summary of the regulation be made available to the public when possible.

Summary

The proposed Guidelines are designed to enhance the State's existing smoke management program by emphasizing greater air district participation and collaboration with stakeholders to protect air quality and public health from smoke impacts resulting from agricultural burning, including prescribed burning on forest and rangelands.

The key features of the proposed changes can be summarized as follows:

- Implement air district smoke management programs that utilize air quality and meteorological data to determine when and where burning can be conducted with minimal smoke impacts.

- Require smoke management plans to be prepared by prescribed burners for review and approval by air districts before burning is conducted.

- Require advanced planning and consultation between prescribed burners, air districts, and the ARB to ensure greater emphasis on preventing or reducing smoke to sensitive populations from prescribed burning.

- Use improved meteorological data and tracking techniques to accommodate necessary increases in prescribed burning.

- Increase consideration of alternative non-burn treatments to prescribed burning.

Description and Technical Discussion of the Proposed Amendments to the Guidelines

This section provides a description of the proposed amendments to the Guidelines and a technical discussion of the proposed amendments. The full text of the proposed amendments to the Guidelines can be found in Appendix A, Proposed Regulation Order.

The Guidelines are divided into three parts. Article 1 of the Guidelines contains the general provisions of the regulation, including clarifying definitions. Article 2 describes the administrative structure and operational requirements of the smoke management program to be implemented by air districts, growers and prescribed

burners. Article 3 contains the meteorological criteria ARB uses to make burn day decisions.

1. Amendments to Article 1 – General Provisions

a. Purpose (section 80100)

We are proposing to add a "Purpose" section to clarify the scope and goals of the Guidelines, and roles of the government entities administering the program. These Guidelines will apply to both crop waste burning and prescribed burning in California. The Health and Safety Code categorizes both of these types of burning as agricultural burning. The goals of the program are to better manage smoke from crop waste and prescribed burning so as to reduce the impact of smoke on California's populace. This will help assure that fire remains available as a resource management tool and provide for increases in prescribed burning. The Guidelines are also intended to provide the flexibility necessary for each air district to implement a program appropriate to the topology, meteorology, and size and types of burning occurring in each of the 35 air districts in California.

b. Definitions (section 80101)

The proposed amendments in this section define new terms that have been introduced as a result of the proposed amendments, clarify existing definitions, and delete terms that are no longer used.

Many definitions have been added to the proposed Guidelines to define terms introduced as a result of the proposed amendments. Significant additions include those defining components of the proposed air district smoke management program such as "burn plan," "burn project," "smoke management plan," "smoke management prescription," and "smoke management program." These terms will be discussed in more detail in Article 2 of the Guidelines (starting at section 80140). Additional terms defined include those for "forty-eight hour forecast," "seventy-two hour outlook," and "ninety-six hour trend." These terms will be discussed in further depth in the discussion under section 80145 – Program Elements and Requirements. The term "marginal burn day" is newly defined and is discussed in further depth in the discussion under section 80110. Also newly defined or revised are the following terms "air pollution control district , air quality management district, air district, or district," "air quality," "ambient air," "ARB or state board," "basinwide air quality factor," "Class I area," "fire protection agency," "land manager," "national ambient air quality standards," "particulate matter 10 (PM_{10})," "pre-fire fuel treatment," "prescribed fire," "region," "residential burning," "smoke management prescription," "smoke sensitive areas," "state ambient air quality standards," "wildfire," "wildland," "wildland fire," and "wildland/urban interface."

The definition for "agricultural burning" has been expanded. The current Guidelines simply refer the reader to the California Health and Safety Code (HSC) for a definition of agricultural burning. We have proposed to include the HSC definition in the

regulation. This clarifies that both crop waste burning and prescribed burning (along with other specific types of burning) are considered agricultural burning under the HSC definition. The definition for "designated agency" was changed to make it clear that an air district can request the ARB to designate appropriate agencies with the authority to issue agricultural burning permits. The definition for "wildland vegetation management burning" was updated to reference the California Code of Regulations rather than the California Administrative Code, which is no longer used.

Additionally, several terms have been deleted because the Guidelines no longer use them. These include the definitions for "brush treated," "silviculture," "Tahoe basin," and "timber operations."

Definitions that remain unchanged include "open burning in agricultural operations in the growing of crops or raising of fowl or animals," "permissive-burn day," "no-burn day," and "range improvement burning."

c. Scope and Applicability (section 80102)

This section was renamed to define the scope of the Guidelines, identify the government entities responsible for developing and implementing the Guidelines, and describe the focus and desired outcomes.

This section clarifies that air districts are the authority for implementing the burn authorization system, while the ARB exercises overall State oversight and responsibility for declaring burn days, marginal days, and no burn days. This section also specifies the goals of these Guidelines which are to support the achievement of air quality standards and protect public health, while being sensitive to economic concerns, to efficiently dispose of agricultural and forest waste products.

A provision is proposed for deletion that exempts from the requirements in these Guidelines any air district with an agricultural burning rule or regulation in place five or more years prior to September 19, 1970. We are proposing to delete this provision as it is duplicative of State law.

d. Exceptions (former section 80102)

We are proposing that this section be deleted. Currently, this section exempts burning conducted during the course of agricultural operations or disease or pest prevention when either type of burning occurs at elevations greater than 3,000 feet mean sea level (msl). It also exempts all burning occurring during the course of agricultural operations at elevations greater than 6,000 feet msl. As this type of high-elevation burning may impact populated areas, it is not appropriate to exempt it from the requirements of the program.

e. Permissive-Burn, Marginal Burn, and No-Burn Days (section 80110)

This section has been renamed “Permissive-Burn, Marginal Burn, and No-Burn Days” rather than “Permissive-Burn or No-Burn Days.” The change is intended to reflect the proposed addition of a third class of burn day, the “Marginal-Burn Day.” We are proposing to include a subsection requiring the ARB to specify each day of the year as a permissive-burn day, a marginal-burn day, or a no-burn day. The marginal-burn day provision would include days with marginally acceptable meteorology or air quality that, under the existing Guidelines, might be declared no-burn days. This would occur because regional meteorological or air quality conditions are too general to make micro-scale decisions confidently. Without better definition of the area in question, inappropriate decisions could be made and result in adverse impacts on nearby communities. However, the new designation would allow limited amounts of burning provided better and more detailed information is provided, and a determination is made that smoke impacts are unlikely to occur.

This section also provides for an air district and the ARB to develop mutually agreeable procedures, based on existing or refined meteorological criteria in Article 3 of the Guidelines. The procedures would allow the air district to demonstrate that a given day is a marginal burn day or a burn day.

We have also proposed slight wording changes to clarify the ARB’s intent to issue burn notices by 3:00 p.m. each day for the following day. It also clarifies that the decision may be postponed to no later than 7:45 a.m. on the day in question if conditions are such that it is not possible to make the forecast until the next day. A subsection has been added noting that no burning will be allowed on no-burn days, except in cases of threatened imminent and substantial economic loss, certain circumstances resulting from natural ignition of forests or rangeland, and, if appropriate, for the burning of empty pesticide bags generated during agricultural operations. We are proposing to delete the subsections describing exemptions other than those described above. Deletion of these exemptions will have no impact on an air district’s ability to authorize burning in the case of threatened imminent and substantial economic loss.

We are proposing to delete the subsection allowing ARB to issue permissive-burn or no-burn decisions 48 hours prior to the scheduled burn event. Many burners interpreted this provision as a forty-eight hour “decision” issued by the ARB that was binding on the ARB and the air district. These decisions allowed burners with a permissive-burn decision to lawfully ignite fires 48-hours hence, whether or not conditions at the time of ignition were acceptable for that fire. As discussed in Article 2, ARB will issue forty-eight, seventy-two, and ninety-six hour forecasts. These are defined in the proposed amendments as forecasts of conditions. A favorable forecast does not constitute an advance permission to burn no matter the current conditions at the time of the forecast. As discussed further in Article 2, the land manager must receive additional confirmation for the burn from the air district no more than 24 hours

prior to the burn. In addition, to lawfully ignite the fire, conditions must comply with the burn prescription at the time of ignition.

f. Burning Permits (section 80120)

The most significant amendment proposed for this section is the deletion of the subsection allowing range improvement burning on no-burn days between January 1 and May 31. Little burning of this type occurs, and there is no technical reason to justify this type of burning during times of adverse meteorological or ambient air conditions. We are also proposing that permits to burn include wording notifying the permittee that, in addition to a permit to burn, the burn event must be approved by the air district under the air district smoke management program. The form of that approval may vary from district-to-district depending on the size and location of the burn event and the air district's smoke management program. The remaining proposed amendments are minor and are intended to clarify existing provisions.

g. Burning Report (section 80130)

There are two major proposed amendments to this section. The first amendment makes reporting requirements uniform for all air districts in California. The current regulation requires a breakdown of waste type and amount burned each month in the yearly report of burning from the Sacramento Valley and San Joaquin Valley Air Basins only. Currently, the other air districts must report, but not break down the waste by type by month in their reports. We are proposing that all air districts annually report the amount and type of waste burned, with no monthly breakdowns. Also, we are proposing that the data for crop waste can continue to be reported in tons or acres but that data from prescribed burns must be reported in tons. This distinction is made because the tons of crop waste per acre do not vary substantially for each crop type, so ARB can estimate the amount of material burned if either tons or acres of each type of crop waste are reported. However, the amount of material burned per acre can vary substantially for prescribed burns, making it difficult or impossible to accurately estimate the amount of material burned based on reports of acres burned. We are also proposing that air districts identify the county in the air basin where the burning occurs.

We propose to delete the provision allowing identification of waste type for at least 80 percent of the waste burned in the Sacramento and San Joaquin Valleys. This means that all waste burned must be identified. These changes are intended to improve our ability to evaluate burn trends in California and allow an improved technical evaluation of the current burning practices.

An additional proposed amendment makes the reporting procedures for burning on no-burn days conducted under the "imminent and substantial economic loss" provision consistent throughout the State. Currently, the Sacramento and San Joaquin Valley air basins must report on a quarterly basis, while the rest of the State reports on a yearly basis. As proposed, all air districts would report on a yearly basis.

The remaining proposed amendments are intended to clarify existing provisions.

2. Amendments to Article 2 – Air District Smoke Management Program

We are proposing to rename this Article "Air District Smoke Management Program" from "Implementation Plan" to better reflect the nature of the proposed amendments to the program. As proposed, air districts or regions would develop comprehensive smoke management programs that are specific for each air district or region.

Article 2 describes the essential components of an air district smoke management program to manage smoke from all types of burning and consists of three main sections. The first section, "General Requirements," includes the timelines for submittal and implementation of the program, requirements for formation of a regional program (i.e., in which several contiguous air districts can coordinate one smoke management program for their area), time limits for ARB approval, the timing for air district compliance with these Guidelines, and the process for resolving air district-ARB disputes regarding approvability of a district program.

a. General Requirements (section 80140)

This section specifies that all air districts must develop and implement smoke management programs consistent with the proposed Guidelines. Each air district program must develop and implement a system for regulating the amount, timing, and location of burn events to minimize smoke impacts. It must emphasize communication and coordination between the ARB, the air districts and the burners. It must also contain a process for public notification and education by prescribed burners.

The proposed smoke management program replaces requirements for submittal of implementation plans, permit forms, and enforcement procedures. Therefore, we are proposing to delete existing sections that describe components of the implementation plan.

This section provides an option for air districts to form regions, for the purpose of coordinating smoke management within a contiguous area. The purpose of establishing a region would be to maximize limited resources and manage agricultural burning where smoke from these activities normally spreads across county lines. We believe that many air district budget concerns associated with implementing the proposed Guidelines could be reduced through this resource-sharing mechanism. The proposed amendments include procedures for forming a region which include development of a memorandum of understanding outlining the process for coordination, implementation and enforcement. Air districts that elect this option must also include a description of their regional program, including boundaries, participants, the decision-making structure, and a workplan for implementation. The regional designation in no way usurps or supercedes the individual authority of each district in the region to carry out its responsibilities under the Health and Safety Code.

This section includes a provision stipulating that the existing Sacramento Valley smoke management program is a regional program.

This section includes a smoke management program implementation schedule that applies to all air districts. As proposed, this schedule promotes timely application of smoke management tools that are protective of public health, while allowing the air districts sufficient time to conduct a public process for adoption of enforceable mechanisms for implementation of the program, e.g., rules and regulations, permit program enhancements, memoranda of agreements, and policies and procedures.

This section would require that by September 1, 2000, each air district or region implement the applicable prescribed burning elements of the Guidelines. We describe this element further in the discussion of section 80160. By July 1, 2001, each air district would be required to adopt a smoke management program that complies with all applicable requirements contained in the Guidelines. This section specifies that ARB may extend each of these deadlines by six months if an air district can show good cause for needing additional time.

The existing Guidelines require the Sacramento Valley region to adopt a Sacramento Valley Basinwide Plan by July 2000. This plan is already being developed. Therefore, the proposed Guidelines exempts Sacramento Valley from the implementation schedule until after submittal of the Sacramento Valley Basinwide Plan required on July 1, 2000. After that date, the provision in the existing Guidelines applicable to the Sacramento Valley would sunset. Sacramento Valley would then be required to meet the same deadlines as other air districts for adoption of a smoke management program that meets all applicable requirements of the Guidelines.

We also propose a process for remediation of disputes between the ARB and an air district or region which affects the approvability of the air district's or region's program. This provision was included in the Guidelines to assure air districts and other stakeholders that the ARB will not act in an arbitrary or capricious manner when considering program approvability. The proposed Guidelines require an air district or region to submit its smoke management program to the ARB Executive Officer for approval. The air district will be given opportunities to confer with the Executive Officer and address any issues prior to formal disapproval. The air district will be able to appeal an ARB decision to disapprove the air district program directly to the Board of the ARB.

As proposed, the air district or region would be notified within 120 days of submittal of their program to the ARB of the Executive Officer's intention to approve or disapprove the program. If the Executive Officer intends to disapprove the program, or any portion thereof, he or she would indicate the basis for the decision. The Executive Officer would then meet with the affected air district or districts (if there is a regional program in place). Following this meeting, the Executive Officer would make the final decision regarding program approval. If the program is not approved, the air district

could appeal directly to the Board of the ARB (rather than the Executive Officer). The Board would hold a hearing in the air district or region affected if requested by the air district or region.

If the ARB Executive Officer disapproves the program, the air district or region would be required to amend and resubmit the program to the ARB Executive Officer for approval within 120 days. If the air district does not resubmit an approvable program within 120 days of disapproval, the ARB, after a public hearing, would adopt an alternative program, which the air district would then enforce.

After a program is in place and approved by the ARB, amendments would be submitted to the ARB for approval before they are effective. Any amendments would be submitted to the ARB within 30 days of adoption by the air district or region. Once a program is approved by the ARB, the air district in consultation with the ARB, would decide upon an appropriate schedule for updating the program. Until any amendments are approved by the ARB, the program previously approved by the ARB would remain in place.

b. Program Elements and Requirements (section 80145)

This section of the Program Requirements describes both the general and specific elements and requirements for the proposed air district or regional smoke management program, procedures for implementing the program, and rules to limit smoke emissions.

The daily burn authorization system found in this section is the heart of the program. A successful system will result in control over the amount, timing and location of burn events so as to minimize and avoid cumulative smoke impacts to the affected community, and prevent public nuisance. The remaining components, procedures and rules are intended to aid in development of a successful daily burn authorization system.

<u>General Program Description and Elements</u>

The first component in this section describes the program and its necessary components. This includes the air district's or region's:

- daily "burn authorization system," which regulates the amount, timing, and location of burn events to minimize impacts on smoke sensitive areas, avoid cumulative impacts, and prevent public nuisance;
- meteorological and air quality data which are used to determine basinwide meteorological and air quality conditions; and
- personnel resources to operate program.

These provisions are general to allow air districts to develop programs that are commensurate with the air quality problems caused by burning in their districts.

The following example explains how this element would operate in practice.

Measurements of morning stability and winds are used with morning air quality in the Sacramento Valley Air Basin in a set of empirically-derived equations to determine the theoretical maximum amount of burning that can be done that day. The Air Basin coordinator and the ARB duty meteorologist determine an initial allocation to be divided among the air districts in the basin. Allocations to the districts can increase during the day depending on changes in air quality and meteorological conditions. Air district staff then determine placement of individual burns using forecasts of valley winds. With knowledge of local conditions, the air district is in a good position to decide what portion of the allocation to use each day.

An exemption from the requirement for a burn authorization system is provided for districts with small amounts of agricultural burning, not including prescribed burning, that, based on past experience, do not contribute to air quality problems. As an example, in the Bay Area District, relatively small amounts of crop waste burning occur, with no reports of public complaints or smoke impacts. Under such circumstances, an air district could seek an exemption from this provision of the Guidelines from the ARB.

Procedures to Implement the Program

The second major component describes air district procedures required to implement the program. The proposed Guidelines give air districts the option of approving procedures required by this section either as air district board resolutions or adopted as rules or regulations. These include procedures for:

- noticing burn/no-burn/marginal-burn day declarations;
- issuing 48-hour forecasts, 72-hour outlooks, and 96-hour trends for specific prescribed burns;
- authorizing burning on a daily basis;
- obtaining daily information necessary for authorizing next day burns – including information such as any planned and unplanned wildfires, and current levels of crop waste burning;
- addressing cross-jurisdictional smoke impacts through coordination with any neighboring air districts, regions, or states;
- enforcement;
- prioritizing burning from sources such as crop waste, forest land, rangeland, and household waste burning. These procedures would only be required if an air district or region decides to establish a prioritization scheme to better allocate burns in their district or region. In considering these priorities, the air district or region would consider the public benefits of burning, including safety, public health, forest and crop health and wildfire prevention, economic concerns and ecological needs, as well as the efforts taken to reduce smoke impacts through non-burn alternatives, such as removal of excess material, piling, dividing materials into smaller burn units, drying, etc.; and

- burning empty containers which held pesticides or other toxic materials, if an air district or region determines that it is appropriate to allow such burning.

Also included in this element is the requirement that wording be included in burn permits, specifying that a permit will only be valid on burn days and when authorized under an air district or region's burn authorization system. Additionally, this element of an air district or region's smoke management program must include plans for periodic assessment of actions taken by burners to minimize smoke emissions through use of alternatives to burning or pre-burn treatments.

The following is an example of how this requirement might be implemented.

Each day, air district staff would authorize specific burn projects or otherwise allocate the number of acres that can be burned and in which locations. This determination would be made based upon an evaluation of current and forecast meteorological conditions for the day, the amount of smoke likely to be generated from a mix of projects, and an analysis of the likely impacts on air quality. The results of this analysis would provide information to the air district about which specific burns to select or place.

Experience has shown that it is not always the average daily concentration of specific pollutants that is monitored at the end of the day that defines whether a burn adversely impacted a community. Health impacts and individual discomfort are often prompted by a relatively short exposure to higher concentrations. In order to determine the burning allocation for any particular period, the air district needs to consider wind direction and air movement; placement and transport are critical. High quality forecasts of wind direction and speed for specific locations are a key ingredient. In order to avoid the transport of smoke to downwind locations, it is important to coordinate burn placement with nearby or air districts that may be affected.

The current regulation provides for a forty-eight hour "decision" which is issued by the ARB. These decisions allow burners with a positive decision to lawfully ignite fires 48-hours hence, whether or not the day of ignition was a burn day for that air basin. This practice can result in unnecessary and excessive smoke impacts. We are proposing to amend the program such that forty-eight hour "forecasts" will be issued, rather than forty-eight hour "decisions". The forty-eight hour forecast as proposed is a forecast of conditions forty-eight hours from the time of the forecast. It is not a blanket permission to burn. As proposed, the land manager must receive additional confirmation for the burn from the air district no more than 24 hours prior to the burn event. In addition, conditions must comply with the burn prescription at the time of ignition to lawfully ignite the fire.

Rules to Limit Emissions from Agricultural Burning

The third major element of an air district or region's smoke management program consists of rules to limit emissions from agricultural burning. These include rules which:

- require preparation and arrangement of material to be burned in order to minimize emissions;
- require the use of approved ignition devices;
- limit hours and days of residential burning;
- consider allowing the burning of empty pesticide bags on no-burn days if produced during agricultural operations; and
- minimum drying periods for various crop waste and vegetative materials.

Most of these rules are included in the current Guidelines, although some changes are proposed. Because forest material may be difficult to arrange to minimize emissions, this is only required when it is feasible.

We are also proposing to add a requirement that air districts limit residential burning to permissive burn days and daylight hours. Residential burning could occur at other hours if local conditions indicate that smoke impacts are not expected to occur, or coordination with local fire agencies requires burning during other hours.

c. Special Requirements for Open Burning in Agricultural Operations in the Growing of Crops or Raising of Fowl or Animals (section 80150)

In revising this section, we are proposing to delete some subsections. These include optional air district provisions for implementation of a program to manage smoke from agricultural operations, including components such as hours of burning, potential no-burn seasons, and regulation of burning when wind is blowing toward populated areas. These types of provisions would be included in an air district or regional smoke management program. Also proposed for deletion are some provisions associated with the Sacramento Valley Basinwide Plan. The provisions relate to management of rice straw burning, including the basinwide acreage allocation and times of year when rice straw burning may be conducted. We propose to replace these provisions with the proposed burn authorization system included in section 80145. The key components of the Sacramento Valley Basinwide Plan have been moved to section 80155, "Sacramento Valley Basinwide Program" (see below). For purposes of clarity and to avoid redundancy, we are proposing to move some of the remaining provisions to the previous section (section 80145).

The provision, which gives air districts the option of allowing burning of empty pesticide bags on no-burn days has been moved to the Program Elements and Requirements section (section 80145) along with the provisions requiring preparation of agricultural waste to reduce smoke emissions prior to burning.

The remaining provisions include special requirements that must be included in air district's or region's smoke management plans. These requirements address methods of ignition and daily burn hours for field crop burning, and an exemption from these requirements for air districts with no crop-growing operations. Also included in this section are the requirements for rules and regulations in the Sacramento and San Joaquin Valley air basins regarding rice straw burning. These include requirements for even distribution of rice straw prior to burning and assuring that the rice straw to be burned is dry.

Between September 1, 2000 and April 1, 2003, air districts are given the option of implementing these requirements through adopted rules and regulations, or other enforceable mechanisms (such as permit program enhancements, memoranda of agreements, and policies and procedures). However, by April 1, 2003, these requirements must be met through adopted rules or regulations.

d. Particulate Emissions from Burning Various Crop Wastes (former Table A of former section 80150)

We are proposing to delete Table A in the existing Guidelines (in section 80155). This table depicts the conversion of tons or acres of crop waste burned to pounds of particulate matter emissions. The table was originally included to allow the Sacramento Valley air districts to convert any agricultural waste burned to rice straw equivalents so as to allocate the total amount of waste burned each day. Because this program will be replaced by the daily burn authorization system included in each air district's or region's smoke management program, we have deleted this table. For emission factors and fuel loading factors, burners should consult with the appropriate air district to determine which factors are most appropriate for the burning being performed. In the absence of locally available information, burners could consult with the ARB about appropriate factors.

e. Sacramento Valley Basinwide Program (section 80155)

This section contains the key elements of the Sacramento Valley Basinwide Plan excerpted from section 80150. However, we are proposing some modifications to these provisions. One major proposed amendment to the program is that the Agricultural Burning Plan would no longer need to be submitted on a yearly basis. Rather, it would be submitted once, and then modified as necessary. Additionally, the plan would apply to the entire Sacramento Valley Air Basin. Currently, areas at 3000 feet mean sea level (msl) and above are exempted from the program. We are proposing to delete the exemption for those upper elevations as smoke from this burning does impact population centers both at that, and lower, elevations.

f. Range Improvement Burning (former section 80160)

We are proposing to delete this section from the regulation, because the relevant requirements for range improvement burning are now contained in proposed

section 80145, “Program Elements and Requirements,” and section 80160, “Special Requirements for Prescribed Burning in Wildland and Wildland/Urban Interface Areas.”

g. Requirements for Prescribed Burning in Wildland and Wildland/Urban Interface Areas (section 80160)

The proposed Guidelines place new responsibilities on prescribed burners, including private and commercial landowners, State and federal land managers, and fire districts that conduct prescribed burning. These requirements include the annual or seasonal registration of prescribed burns or anticipated wildland fires managed for resource benefits, and the preparation of smoke management plans.

Prescribed burning occurs in both wildland and wildland/urban interface areas. While the proposed requirements place some additional responsibilities on prescribed burners (compared to crop waste burning), we believe that these requirements are necessary because prescribed burns are often multi-day events and the fuel loading may be very heavy (i.e., higher emissions per acre burned), resulting in high particulate matter emissions. Fuels are often heterogeneous, burn unevenly and continue to smolder, and have the potential to spread uncontrollably. For these reasons, this type of burning is, at times, unpredictable and can result in extremely high levels of particulate matter for extended periods. Crop waste burning, on the other hand, is characterized by lighter fuel loading (i.e., lower emissions per acre burned), burns that are generally well-contained and concluded in a few hours, and fuels that are homogeneous and well-dried.

New provisions would require planned burn projects to be annually or seasonally registered with the air district. This would include events where naturally ignited fires (for example, those occurring as a result of lightning strikes) are managed for resource benefits and allowed to continue unsuppressed. Additionally, we are proposing to establish tiered requirements for smoke management plans. Those conducting smaller burns, with less potential for adverse impacts, would be required to submit to their air district or region only a minimal amount of information. Those conducting larger burns, or burn events expected to continue overnight or for multiple days, would be required to submit more detailed information. All prescribed burning must comply with the air district or region’s burn authorization system. Smoke management plans would be required for larger burn events.

Tier 1 would encompass burn projects greater than 10 acres or estimated to produce more than 1 ton of particulate matter. Those conducting burns of this size would be required to submit to their air district or region a smoke management plan containing the following information:

- location, types, and amount of material to be burned;
- expected duration of fire from ignition to extinction;
- identification of responsible personnel, including telephone numbers where they can be contacted; and

- identification and location of all potentially impacted smoke sensitive areas.

Tier 2 burn events, including those burn projects of greater than 100 acres or estimated to produce more than 10 tons of particulate matter, must submit to the air district or region the following additional information:

- identification of meteorological conditions necessary for burning;
- the criteria the land manager or designee will use for making burn decisions;
- projections, including a map, of where the smoke from burns is expected to travel, both day and night;
- specific contingency actions (such as fire suppression or containment) that will be taken if smoke impacts occur or meteorological conditions deviate from those specified in the smoke management plan;
- an evaluation of alternatives to burning; and,
- a description of public notification procedures used.

Those conducting Tier 3 burn events must include plans for monitoring smoke produced as a result of these burns. Tier 3 would include any of the following burn projects:

- those of greater than 250 acres;
- those that will continue to burn or smolder overnight;
- those that occur near smoke sensitive areas; and,
- any other burn events that are of concern to the affected air district.

Additionally, for those multi-day burns which may impact smoke sensitive areas, the air district or region may require those burners to coordinate with the air district or the ARB to determine if the burn event may continue.

Notwithstanding the requirements above, an air district or region may adopt alternative thresholds if it demonstrates that alternate thresholds to those outlined above are more appropriate for that specific air district or region.

Air district or regional smoke management programs must include procedures for air district review and approval of smoke management plans. Air districts or regions must also notify the ARB of large or multi-day burns, and may arrange to have the ARB review and approve these burn events.

Air districts must require land managers to consult with the air district or region regarding naturally ignited fires started on a no-burn day. If the fire begins in an area where the land manager would consider allowing the fire to continue in order to achieve resource benefits, it is important that the air district or region be given the opportunity to be involved in the decision-making process. Therefore, we are proposing that these fires be treated as unwanted fires, unless the land manager has consulted with the air district, and the air district has determined, based on smoke impact considerations, it is appropriate that the fire can be managed for resource benefits.

For any unplanned (naturally ignited) burn events larger than 10 acres in size, that are allowed to continue and are managed for resource benefits, the air district or region smoke management program must include a provision requiring land managers to submit smoke management plans within 72 hours of ignition.

Air districts must require land managers to comply with the conditions in their smoke management plan and burn prescription on the day of the burn event, prior to ignition. We are proposing this amendment because there have been numerous examples of prescribed burns being ignited when conditions are not within the burner's own conditions for burning. One possible result of these actions is that the fire spreads, without the ability of the burner to control the direction or intensity. The Lowden, California fire, which escaped on July 2, 1999, is an example of this. We believe we are justified in this requirement because an out-of-control fire can result in serious adverse impacts to the surrounding community. Additionally, such fires can further exacerbate already-existing adverse air quality conditions.

Additionally, we are proposing that burners complete a post-burn smoke management evaluation for fires in excess of 250 acres in size. The goal will be to learn what contributes to successful smoke management as well as discovering how smoke impacts occur. For large area fires burning heavy fuels over several days (with the added challenge of night time smoke drainage down canyons toward smoke sensitive areas), the report would be detailed enough to provide insight into the smoke behavior. For fires with light fuel and of short duration, the evaluation may be quite brief.

We are also proposing that the air district or region include regulations requiring the following:

- procedures describing a satisfactory public notification and education process for the burners, as well as providing for availability of public smoke complaints;
- prior to burning, vegetation must be in a condition to facilitate combustion and minimize emission;
- waste piled prior to burning, when possible and not counter to good silvicultural or ecological practices;
- waste prepared to burn with a minimum of smoke; and,
- burn permit holders comply with applicable requirements of the State Department of Fish and Game for any burn events intended to improve land for wildlife and game habitat.

Between September 1, 2000 and April 1, 2003, air districts are given the option of implementing these requirements through adopted rules and regulations, or other enforceable mechanisms (such as permit program enhancements, memoranda of agreements, and policies and procedures). However, by April 1, 2003, these requirements must be met through adopted rules or regulations.

h. Forest Management Burning (former section 80170)

We are proposing to delete the forest management burning section from the regulation. Some components of this section have been deleted because they are related to smoke management, and would therefore be components of the air district or region's smoke management plan. These include requirements regarding ignition speed, acceptable wind direction, and fuel drying times. The remaining requirements in this section are general and have been moved to the Program Elements and Requirements section (section 80145).

i. Exemptions (section 80170)

Section 80170 specifies that air districts with no prescribed burning can be exempted from the requirements of section 80160. Also, air districts may exempt from the requirements of section 80160 specific range improvement projects, or the initial establishment of an agricultural practice on previously uncultivated land, if the air district determines that smoke impacts are not expected from these projects.

j. Wildland Vegetation Management Burning (former section 80175)

We are proposing to delete this section from the regulation. Many provisions contained here are general and are included in the Program Elements and Requirements Section (section 80145). Much of this type of burning falls under the category of prescribed burning, and would be subject to the requirements of section 80160.

3. Proposed Amendments to Article 3 - Meteorological Criteria (sections 80179-80330)

This section stipulates the criteria that allow the ARB to determine burn or no-burn days for each of the air basins in California.

We are not proposing significant changes to the meteorological criteria themselves at this time. However, we are proposing to add section 80179, "General," that will allow alternative criteria to replace criteria in Article 3 for up to 3 years for the purpose of testing and developing new meteorological criteria for a specific air basin or region. Such changes to the criteria may allow for greater delineation of factors to determine whether a burn day decision in one part of an air basin can be made differently from another portion of the air basin without adverse impacts.

We are proposing to delete the provision allowing "burning control notices" or burn decisions to be issued up to 48 hours in advance of the planned ignition time. We are proposing a 48-hour forecast, rather than a 48-hour decision as discussed earlier in this staff report. We are also proposing to delete references to "premium permissive burn days" as this declaration has not been used for many years and is obsolete.

We are also proposing to delete the afternoon stability meteorological factor for the Sacramento Valley Air Basin since an evaluation of that forecast factor determined that it is not always a useful parameter. This change has been tested operationally in the Sacramento Valley Basinwide Plan for at least a year.

VII. DISCUSSION OF SIGNIFICANT ISSUES

As indicated earlier, scoping meetings on the proposed Guidelines were held in early 1999 with air districts and the interested public, followed by workshops and other public meetings throughout 1999 and in January of 2000.

ARB considered the following policy-related comments in developing the proposed Guidelines.

Program Costs

The air districts also raised concerns that the ARB staff has not adequately characterized the total costs of the regulation. The air districts expressed concern that new program requirements would impose significant start-up costs to design a new system (e.g., monitoring equipment, computers, modeling tools) as well as annual operational costs. According to the air districts, the current fee structure already falls short of fully recovering the cost of the burn program for their region. Additionally, many air districts believe that a large increase in fees to fund the program would not be acceptable to their stakeholders. They have indicated that the proposed Guidelines will affect the way they administer smoke management programs, resulting in additional costs with no committed source of funding to support these activities. We agree that the air districts will incur additional costs and are committed to working with the air districts and others to identify funding sources that will fully recover costs.

In addition, the air districts raised concerns about additional costs to burners that may result from the proposed Guidelines that have not been included in the overall program costs. These additional costs include the costs attributable to cancelled burn projects. This situation occurs when, based upon a 48-hour forecast, burn crews mobilize on the day of the burn only to be told that morning that the burn must be cancelled because current meteorological and air quality conditions are not conducive to burning. We recognize that such costs may occur on occasion, but believe the forecasting and planning functions within the proposed Guidelines are sufficient to minimize the occurrence of such events, and in turn, the costs.

Although the ARB will work closely with air districts to reduce the overall cost of the program, and to find other revenue streams, it will be the air districts' responsibility to fully comply with the Guidelines. As provided by State law, air districts can recover costs resulting from compliance with State requirements by fees that are within the air district's authority to assess on sources that engage in agricultural burning (i.e., private landowners and FLMs). Therefore, any additional administrative costs resulting from an air district's program that is not recoverable by State subvention funds or other revenue sources may have to be financed through increases in their permit fees. This will ultimately impact compliance costs for those burn agencies and private firms and landowners subject to air district programs.

In attempting to resolve this problem, the air districts suggested a number of revenue options. These options including establishing a uniform fee, funding agreements between the ARB and FLMs, and specifying a new budget line item in the air districts' subvention fund administered by the ARB.

The State is aware of the increasing financial burden that State requirements will likely impose on air districts and that the existing agricultural burning program in air districts does not appear to be self-sustaining. For these reasons, the ARB is committed to working with the air districts to find ways to fully recover the costs of the program. In addition, we are committed to seeking ways to elicit cost savings without sacrificing health-related benefits of the program. One way is to achieve closer cooperation, perhaps through memoranda of understanding, between State and air districts, FLMs, commercial timber owners and local governments. Such agreements would establish formal working partnerships that reinforce the mutual goals contributing to forest and public health and reduce duplicated efforts.

Currently, we are working with the air districts and the USFS to install an interactive computer-based system to track prescribed fires in the State. This automated system should help to reduce the costs currently needed to plot and estimate the impacts of planned and actual burns to determine if additional projects can be safely authorized. We expect the program to be operational by the end of the year. In addition, we plan on working with our federal partners to identify areas of cost-sharing and in-kind services in which federal fuels management and smoke management expertise can be utilized as part of the collaborative approach that the proposed Guidelines envision.

Program Implementation

Many air districts expressed concern about their ability to adopt rules or regulations in time meet the September 2000 implementation schedule for the prescribed burning element specified in the proposed Guidelines. Several air districts believed that their current program was sufficiently comprehensive to meet the requirements of the proposed Guidelines. Other air districts stated that they could supplement their existing regulatory requirements with new or revised procedures and permit changes, but that the process for adopting rules and regulations would make a September compliance date impossible.

The ARB agrees that the air districts should have sufficient authority to implement changes to the proposed Guidelines governing prescribed burning without adopting new rules or regulations. Therefore, the proposed Guidelines would now require that by September 1, 2000, each air district or region would implement the prescribed burning elements of their smoke management program that complies with the requirements of the prescribed burning element of the Guidelines. By July 1, 2001, each air district would be required to submit to the ARB its revised smoke management program that demonstrates compliance with the requirements contained in the

Guidelines. However, adoption of rules and regulations that comply with the Guidelines would not be required until April 1, 2003.

The existing Guidelines require the Sacramento Valley region to adopt a Sacramento Valley Basinwide Plan by July 2000. It would not be reasonable to expect the region to adopt a new program on the heels of a recently adopted program that closely reflects the requirements in the proposed Guidelines. Therefore, the proposed Guidelines exempts Sacramento Valley from the September 2000 implementation schedule until after submittal of the plan required on July 1, 2000. After that date, the provision in the existing Guidelines applicable to the Sacramento Valley would sunset. Sacramento Valley would then be required to meet the July 1, 2001 deadline for adoption of a smoke management program that meets all applicable requirements of the Guidelines.

Delegation of Burn Day Authority

Several air districts indicated that they wanted delegation from the ARB to declare burn days for their area. These air districts have, or are planning to have, sufficient resources and technical expertise to make these determinations. These air districts believe that they can offer an enhanced program and better service to their community if they are delegated the authority to declare burn days.

Existing State law assigns the ultimate responsibility to declare burn days with the ARB. As such, the ARB retains the authority to make burn day declarations (including no burn and marginal burn day decisions). However, we are proposing to allow air districts to work in conjunction with the ARB to develop new or revised meteorological and air quality factors for all or part of an air basin. Air districts could use these criteria to assist the ARB in making burn day decisions with the best air district data available. Additionally, refined parameters and enhanced air district capabilities would assist them in determining how much burning in an area could occur without imposing unacceptable smoke impacts on the surrounding community.

Incentives for Alternatives to Burning

Several commenters, including air districts and representatives of private timber companies and the biomass industry, stated that the Guidelines should provide stronger financial and programmatic incentives for use of alternatives to burning. These commenters acknowledged that there are times when fire must be reintroduced in wildlands and forests to achieve ecosystem management goals. At the same time, these commenters believed that an incentives structure was needed to provide the balance necessary between burning for ecosystem restoration and non-burn treatments that posed fewer public health impacts. Other commenters were concerned that the proposed Guidelines would severely limit the ability to conduct prescribed burning in those areas that pose significant risk of unwanted wildfires with their attendant risk to public safety and the ecosystem.

We agree with the commenters that part of the solution to improving fire adaptive and fire dependent ecosystems and vegetation in our national lands requires the reintroduction of fire. In fact, decades of fire suppression have led to negative consequences for forest health, dangerous fuel buildup, reduced biological diversity, and increased incidence of insect and disease activity.

Nevertheless, while perhaps less costly in the short term, prescribed burning must be part of an integrated system for vegetation management that considers public health as well as the public benefits of burn projects. Such an integrated system should include consideration of alternate treatments to burning when economically possible and ecologically desirable. Alternative methods can include such treatments as selective understory thinning, chipping, and mulching, bioconversion for energy generation, animal grazing and to the extent they pose no adverse environmental or ecological consequences, chemical treatments. These treatments can be employed either in the pre-treatment phase, or also as a primary treatment, particularly around urban interface areas and major transportation routes.

Wildland owners and managers have an array of tools, including fire, which can be used to accomplish land use plans, depending on the resource benefits to be achieved. Several factors should be considered when selecting appropriate treatments. These factors include not only safety, cost of treatment, and resource benefits, but also public health protection. The best combination of treatments are those that meet management goals with the most favorable impacts.

The proposed Guidelines call for air districts to develop, when necessary based on the amount of burning done, a burn authorization system that recognizes priorities and appropriate treatment methods for open burning used in agricultural operations and prescribed burning that can be used to minimize smoke related pollution. Each air district, in conjunction with key stakeholders, should determine the right mix of alternatives for their region. Such a mix should utilize the optimum combination of treatments while considering factors such as weather, wildfire prevention, or pre-fire treatments that would best reduce smoke impacts to smoke sensitive areas. For instance, some land may be too remote, terrain too steep, or vegetation too invasive, to undertake anything short of fire. On the other hand, prescribed fires in wildlife habitat, riparian ecosystems, or proximity to wildland/urban interface areas, frequently traveled roads, and campgrounds may pose unacceptable consequences. In this case, mechanical treatments might be the preferred alternative.

The Guidelines would also require a large burn project (i.e., greater than 100 acres in size or estimated to produce more than 10 tons of particulate matter) to develop a smoke management plan that contains an evaluation of alternatives to burning.

CEQA Analysis

The air districts requested that the ARB conduct an in-depth environmental review of potential impacts at the local level associated with proposed revisions to the Guidelines.

Both CEQA and ARB policy require the ARB to consider the potential adverse environmental impacts of proposed regulations or changes to the regulations.

Chapter IX of this staff report provides such an analysis that includes a review of alternatives considered in developing the final proposal, an examination of potential air quality impacts resulting from changes to the proposed regulation, and a discussion of other potential environmental impacts. It is not appropriate for the environmental analysis to include a detailed assessment of the impacts of burning at the local level because we cannot reasonably foresee or predict the specific projects that may occur at a local level. However, we plan to continue working with the air districts during their rulemaking process to identify specific impacts which the ARB environmental assessment of changes to the proposed Guidelines may not address in sufficient detail for air district purposes.

In addition to providing the analysis in the staff report, the ARB will respond in writing to all significant environmental points raised by the public during the public review period and at the Board hearing. These responses will be contained in the Final Statement of Reasons for the Guidelines.

Residential Burning

Under the proposed Guidelines, a burn day declaration would allow open outdoor fires on residential property (residential burning) during daylight hours, unless local weather conditions permit otherwise, or local ordinances require otherwise for fire safety reasons.

Several air districts commented that residential burning was specifically defined in State law as non-agricultural burning and therefore should not be addressed in these Guidelines. Other air districts commented that residential burning should be banned outright and the Guidelines should be used to direct air districts to do so. Still other districts commented that local ordinances could conflict with the proposed daytime restriction in the Guidelines.

The ARB realizes the practical difficulties of enforcing a no burn day in rural areas for residential burning. However, we also believe that residential burning can have a significant impact in local communities when weather conditions are unfavorable. Although residential burning is contained in a separate portion of the Health and Safety Code, ARB believes that this provision in the proposed Guidelines supports the overall goals of the State smoke management program. Further, ARB believes that this provision is consistent with State law (section 41509 of the Health and

Safety Code) that allows a local authority to declare, prohibit, or abate nuisances, and allows the ARB to bring action against such nuisances. Therefore, we have included residential burning in the proposed Guidelines, but have provided flexibility to the air districts to comply with local ordinances. Additionally, we have clarified language in the Guidelines to indicate that residential burning is not considered to be prescribed burning.

VIII. ALTERNATIVES TO PROPOSED AMENDMENTS CONSIDERED

The ARB considered two alternatives in addition to the proposed Guidelines. The first alternative was to retain existing guidelines with no amendments. The second alternative was to establish a more regional approach to smoke management based on a regional allocation system that would strictly cap the amount of materials or acres that could be burned each day. The proposed Guidelines establish a systems-based approach to smoke management that provides statewide consistency while allowing air districts the flexibility they need to deal with unique circumstances in their area, and is the recommended approach.

Alternative 1. Retain Existing Guidelines Without Amendments

The first alternative was to continue the existing agricultural burning program without change.

In fact, the proposed Guidelines retain most of the core program requirements, consolidate redundant requirements that apply to different segments of the agricultural burning community, preserve guidelines applicable to the Sacramento Valley Basinwide Plan, and retain statewide meteorological criteria for regulating agricultural burning. However, ARB believes that failure to update the existing guidelines to reflect new circumstances and information would subject the public to unacceptable adverse health impacts.

While the Agricultural Burning Guidelines have worked relatively well since their inception in 1971, ARB has re-examined California's smoke management program to address important changes in federal public lands policies and air quality requirements. On the one hand, these changes will increase the amount of prescribed burning on federal lands, creating the potential for adverse health impacts on surrounding communities. At the same time, federal health-based air quality standards and visibility goals impose new requirements on states to reduce overall levels of smoke-related emissions associated with open burning. Unless adequately managed, these new factors will inflict an additional burden on public, private, and commercial operations that use open burning to reduce public safety hazards, control pest infestation and crop disease, and manage vegetation and habitat.

Alternative 2. Establish A Regional Allocation System That Would Cap The Number Of Acres Burned.

The ARB staff also considered a program approach that would shift all areas of the State to a regional acreage allocation system. This system would be implemented by the individual air district or region through its approved smoke management program. The ARB, or the regional authority designated in the Smoke Management Program, would establish a daily maximum cap for each region, based on atmospheric conditions. This cap would cover all agricultural burning (not just open burning used in agricultural

operations) within the region. The air district or region would then coordinate the allocation of acres to individual burners within the designated area.

This program approach would establish the maximum number of days available for burning, but would strictly cap the amount that could be burned each day. The cap would be based on meteorological and air quality criteria that determine the carrying capacity for each region to accommodate smoke without significantly impacting air quality. The regulation would also provide a mechanism for air districts to tailor the forecasting and allocation program in daily coordination with the ARB.

This alternative would continue to encourage a regional, collaborative approach to smoke management as the most cost-effective method of reducing adverse smoke impacts. In fact, the existing proposal was modeled after the Sacramento Valley regional program which works effectively in controlling excessive smoke levels in the Air Basin while meeting the needs of its growers to reduce crop residue, control disease and otherwise maintain agricultural productivity.

Staff ultimately decided against mandating such an approach statewide for the following reasons:

- While the Sacramento Valley model works well for relatively homogeneous fuels and weather conditions, it may not be well-suited to more variable weather conditions in which fuels, terrain, elevation, and wind patterns can vary widely. By taking advantage of more localized meteorological data, good decisions to burn can be made without relying upon a basinwide cap system that is based solely on acreage or other unreliable parameters.

- The high degree of variability in meteorology and terrain in certain regions of the State would require an air district, under an acreage cap, to commit significant resources and expertise to make burn decisions on a project-by-project basis.

- Meteorological criteria that we propose to retain in the proposed Guidelines are designed to implement the current burn/no-burn system. In fact, the Sacramento Valley Basinwide Plan uses a more complicated formula to determine daily acres available to be burned. Use of the meteorological criteria alone would be ill-suited to a basinwide allocation scheme in which the criteria would have to be better defined to ensure minimal smoke impacts throughout the air basin.

- While FLMs are likely to significantly increase the number of acres burned on public lands over current levels, most air districts believe that smoke-related problems can be minimized through improved coordination and planning with all affected stakeholders. Rather than an acreage-based cap, air districts believe that comparable protection can be achieved by managing the burns in any given area based on the size, number, and duration of the burn, the type of fuel burned, smoke dispersal patterns, and weather conditions on site.

For these reasons, staff rejected the concept of mandating an acreage-based allocation system. Instead, the proposal calls for a more flexible approach for making daily burn decisions.

Recommended Approach. Establish A Systems-Based Approach To Smoke Management.

This is the approach taken in the proposed Guidelines. Under this concept, air districts would implement a daily burn authorization system that requires specifying the amount, timing and location of burns for the purpose of minimizing smoke impacts on sensitive areas, avoiding cumulative smoke impacts, and preventing public nuisance. The burn authorization system would not allow more burning on a daily basis than is appropriate considering meteorological and air quality conditions.

IX. POTENTIAL ENVIRONMENTAL IMPACTS

Both the California Environmental Quality Act (CEQA) and Board policy require the ARB to consider the potential adverse environmental impacts of proposed regulations. Because the Secretary of Resources for the California Resources Agency has certified ARB's program for the adoption of regulations (see Public Resources Codes section 21080.5), CEQA allows the ARB's environmental analysis to be included in the ARB Staff Report or Technical Support Document in lieu of preparing an environmental impact report or negative declaration. As such, this chapter analyzes the environmental impacts from proposed changes to the existing Guidelines.

In addition, the ARB will respond in writing to all significant environmental points raised by the public during the public review period or at the Board hearing. These responses will be contained in the Final Statement of Reasons for the Smoke Management Guidelines.

On January 1, 1994, the new requirements of SB 919 became effective (Stats. 1993, Chapter 131). SB 919 amended CEQA by adding new Public Resources Code section 21159. With regard to the proposed Guidelines, Public Resources Code section 21159 requires that the environmental analysis conducted by the ARB include, at a minimum, all of the following: (1) an analysis of the reasonably foreseeable environmental impacts of the methods of compliance, (2) an analysis of reasonably foreseeable feasible mitigation measures, and (3) an analysis of reasonably foreseeable alternative means of compliance with the regulation.

Our analysis of the reasonably foreseeable environmental impacts of the methods of compliance is presented below. In fulfillment of the requirement for an analysis of reasonably foreseeable feasible mitigation measures, we have determined that no mitigation measures are necessary because we have identified no significant adverse environmental impacts associated with the proposed Guidelines. However, we will continue to monitor implementation of the regulation to insure that no serious adverse impacts occur in the future. In fulfillment of the requirements for an analysis of the reasonably foreseeable alternative means of compliance with the regulation, the ARB believes that the proposed Guidelines provide a great amount of latitude and flexibility to the air districts in fulfilling smoke management objectives. This flexibility serves to offer to air districts various compliance options within the context of the Guidelines.

Proposed Finding

The ARB staff has conducted an analysis of the potential environmental impacts of the proposed changes to the Guidelines. Based on this evaluation, we have determined that the proposed Guidelines would not pose significant adverse environmental impacts. Rather, we expect that compliance with the Guidelines will reduce smoke-related health impacts from agricultural burning, including prescribed burning.

As indicated in the health effects portion of the staff report, there is a mix of pollutants associated with agricultural burning, including prescribed burning, that have known adverse effects on human health. Any reduction in these emissions, whether an absolute reduction or a reduction over time in the rate of growth from wildfires, is expected to result in a beneficial impact on air quality and public health.

It should be noted that federal lands are already covered under NEPA requirements in which federal agencies evaluate the environmental impacts of the tools used for resource management on publicly owned lands. They generally consider the impacts on, among other things, plant and animal species in the area, aquatic life, cultural resources, soil conditions, riparian areas, wetlands, water quality, air quality and visibility.

Likewise, State public lands and State responsibility areas are covered by CEQA. These public agencies must undertake comprehensive reviews and analyses of the potential impacts from affected programs and projects that could occur from program implementation. The environmental impacts analysis for the proposed Guidelines is not intended to replace similar analyses performed by federal and state lead agencies for their projects.

Scope and Environmental Analysis of Proposed Guidelines

The scope of the Guidelines is to provide direction to air districts in the regulation and control of agricultural burning, including prescribed burning, in order to provide increased opportunities for prescribed burning as a resource management tool while minimizing smoke impacts on the public. The actions called for include: a daily declaration of days in each air basin in which open burning used in agricultural operations and prescribed burning can occur; a daily authorization of the timing and amount of burns that would be conducted in specific locations in each air district; enhanced coordination of burn decisions and smoke management between air agencies and burners; and protection of populated areas from the impacts of smoke from open burning from agricultural operations and prescribed fires.

We expect compliance with the proposed Guidelines to reduce smoke impacts in a number of ways as discussed below.

1. Burn authorization system

The proposed Guidelines establish a burn authorization system that regulates the “amount, timing, and location” of burn events, taking into account appropriate weather and air quality conditions, and potential health impacts to smoke sensitive populations.

As proposed, the burn authorization system would require the consideration of several factors, such as air quality, meteorological conditions affecting dispersion of smoke during burn events, types, amounts and location of materials to be burned, the location of smoke sensitive areas, and cumulative smoke from all burn activities

occurring concurrently that could affect air quality or public health in affected air districts or region(s).

The burn authorization system would not be required for small amounts of burning provided such amounts do not cause or contribute to air quality problems.

2. Procedures for prioritizing burn projects

The proposal also calls for air district adoption of procedures if they elect to prioritize burn projects. These procedures would be used to minimize smoke impacts, taking into consideration such factors as public health and safety, forest health and wildfire prevention, and ecological needs. This provision is intended to allow air districts to weigh socio-economic and ecological factors when considering the approval and timing of projects that may pose greater or lesser impacts on public health.

3. Requirements for prescribed burning

The proposal also provides for new and enhanced requirements for prescribed burning in wildland and wildland/urban interface areas. Of special note are provisions that will require specific contingency actions to address unexpected adverse impacts, an evaluation of burn alternatives for larger burn projects, monitoring for large burns that can impact smoke sensitive areas, and enhanced coordination, consultation and analysis. These requirements will enhance program effectiveness, with special attention paid to public health and safety requirements.

4. Marginal Burn Days

Finally, the proposal introduces the new designation of “marginal” burn days which the ARB can call for specific air basins or regions if meteorological and air quality conditions approach criteria for permissive burn days and smoke impacts are not expected. This designation will allow burn events to be tailored to prescriptions and permit requirements that are tailored to marginal conditions. As a result, we expect a better accommodation of growers’ needs for disposal of crop waste, prescribed burners’ needs for resource management and public safety, and the public’s expectation for health protection.

Air Quality Impacts

Compliance with the proposed Guidelines is not expected to result in a measurable adverse air quality impact. Instead, compliance should result in reduced smoke impacts, improved air quality, and progress towards achievement of federal and State Clean Air Act requirements affecting air quality standards, prevention of significant deterioration, and regional haze/visibility. The proposed Guidelines should also result in improved collaboration among all affected parties in order to reduce institutional and regulatory roadblocks that hinder the ability of local, State and federal agencies to meet their mutual environmental goals.

The proposed Guidelines should also result in stronger consideration of non-burn alternatives that maximize the amount of vegetation to be treated while addressing smoke-related health considerations. Additionally, the Guidelines should result in an improved smoke management process, particularly in those air districts that intend to enhance their existing program with improvements in modeling, data gathering and analysis techniques. These advancements should improve the day-to-day decision-making process by which air districts minimize smoke impacts when deciding when, where, and how much can be burned without exacerbating air quality.

The addition of a new "marginal burn day" designation in the proposed Guidelines should increase the number of days available to conduct small burns or pre-burn treatments where smoke impacts are not anticipated.

The ARB acknowledges that fire is an effective management tool to correct unhealthy conditions in our nation's wildlands and forests and to reduce the risk of wildfires to public health and safety. However, ARB also believes that fire is not always the only tool, or always the most appropriate treatment for resource benefits or ecological restoration. We intend to work with our federal partners and other interested parties to assess the viability of alternative pre-fire fuel treatments, particularly in the wildland/urban interface areas, in order to encourage additional funding for these alternatives when appropriate and effective for forest health. We also intend to participate more actively in the federal environmental review process to encourage the use of those smoke-reducing treatments that benefit both fire adaptive and fire dependent ecosystems and public health.

Other Potential Environmental Impacts

The following is a discussion of environmental concerns that ARB evaluated to determine if the proposed Guidelines would contribute potential adverse environmental impacts.

1. Water Quality, Watershed Effects, and Aquatic/Riparian Protection

Forests play a critical role in supplying water to outlying cities and towns. Wildfires or improper management of wildland fires could have severe environmental consequences in several ways: aquatic and riparian areas could be negatively affected by sedimentation, ground-disturbing activities, and other forms of degradation; watersheds could be at a high level of risk for cumulative effects; soil productivity, water quality, erosion, or sedimentation could be adversely affected and increase the difficulty of restoring watershed health.

Specific requirements in the smoke management guidelines that apply to prescribed burning are restricted to those issues that relate to smoke-related emissions from such burns, and do not interfere with other parameters that relate to water quality and protection. Additionally, compliance with the proposed Guidelines are not expected

to influence the incidence of wildfires; rather, the proposed Guidelines would require coordination of pre-planning efforts between the burners and the air agencies on the potential for natural ignitions and contingency measures for managing them. Moreover, if a wildfire does occur on a no-burn day, the proposed Guidelines would require the burner to prepare a smoke plan within 72 hours of the burner's decision to manage the wildfire for resource benefits.

The proposed revisions to the Guidelines applicable to prescribed burning would support efforts by FLMs to reduce the long-term flammability of forested areas and restore health to fire adaptive and fire dependent ecosystems on these lands. Therefore, we do not anticipate that water quality, watersheds, or aquatic and riparian areas would be adversely affected as a result of the proposed changes.

2. Recreation

Our national and state parks and forests serve the varied recreation needs of local residents, as well as urban, national and international visitors. Current demographic trends reveal the likelihood of increased public use.

The primary focus of the proposed Guidelines is to minimize smoke-related emissions of agricultural burning to smoke sensitive areas. These areas are defined as populated areas where smoke and air pollutants can adversely affect public health or welfare. Such areas can include national parks and monuments, campgrounds, trails and other populated recreational areas, as well as neighboring towns and villages, hospitals, nursing homes, schools, roads, airports, public events, and shopping centers.

The proposed revisions to the Guidelines applicable to prescribed burning would support efforts by FLMs to enhance the multiple use and recreational features of our parks and wildlands. Therefore, we do not anticipate that recreation would be adversely affected as a result of the proposed changes.

3. Land Use and Planning

Proposed revisions to the Guidelines would not affect present or planned land uses because the Guidelines do not determine the method of treatment or the location of the burn. Instead, the proposed changes would regulate the amount and timing of burn events for locations that are selected by the burners.

4. Population and Housing

We expect affected populations to be beneficially affected by compliance with the proposed Guidelines because of provisions that will require burn managers and air districts to improve public notification procedures and evaluation tools to avoid adverse impacts to smoke sensitive areas from agricultural burning, including prescribed burning.

The proposed Guidelines are not expected to result in the creation or loss of any industry that would significantly affect population growth, or directly or indirectly induce the construction of single- or multiple-family units.

5. Geophysical

The proposed Guidelines would not require the disruption or over covering of soil, changes in topography or surface relief features, the erosion of soil, or a change in existing siltation rates. In addition, the proposed Guidelines will not expose people or property to geological hazards such as earthquakes, landslides, mudslides, ground failure, or other natural hazards because it does not directly require land managers or owners to choose one form of forest fuel or crop waste treatment over another, or to modify any on-site or off-site geophysical formations. On the other hand, it is expected that the choice of actions taken to treat forest fuels or crop waste may have such impacts. These potential impacts must be taken into account by the burner through environmental assessment requirements that may apply to that project.

6. Transportation/Circulation

Compliance with the proposed Guidelines may indirectly result in some transportation impacts. For example, a proposed provision in the Guidelines would require a large burn project (i.e., greater than 100 acres in size or estimated to produce more than 10 tons of particulate matter) to develop a smoke management plan that contains an evaluation of alternatives to burning. Should an air district decide to require projects within a certain radius from a biomass processing plant to transport waste or timber materials to a biomass facility, this could increase the amount of truck traffic on local and state roads and interstates.

7. Biological Resources

No direct impacts from compliance with the proposed Guidelines were identified that could adversely affect plant or animal species or the resources on which they rely. As indicated before, the proposed Guidelines do not determine the selection of the fuel treatment, but only the timing and amounts of the fuel in the location established by the burner. The direct environmental impacts of fuel treatment must be addressed by the project proponent, typically the prescribed burner, pursuant to applicable federal, state, or local permit or environmental assessment requirements.

8. Energy and Mineral Resources

The proposed Guidelines are not expected to deplete non-renewable mineral resources at an accelerated rate or in a wasteful manner. There are no anticipated significant adverse impacts to mineral resources. It is possible that biomass material that is harvested rather than burned will result in greater use of alternative fuels. The air quality impacts of biomass utilization for electric power generation should be thoroughly analyzed as part of an air district's environmental assessment process at such time that

it develops or enhances its smoke management program. Any statewide initiative that allows the bioconversion of vegetation and related materials to ethanol would also be required to perform an environmental assessment pursuant to CEQA requirements.

9. Hazardous Materials and Air Toxic Emissions

The proposed Guidelines will allow for increased agricultural burning, including prescribed burning, provided that the burner can demonstrate through its smoke management plan, that smoke impacts to smoke sensitive areas are not expected and that air quality will not be impacted. While the smoke management program should operate successfully most of the time, occasional problems may occur and result in smoke impacts on an affected population. However, the program is designed to reduce the potential for these situations to occur as they have in the past. Therefore, even with the proposed increased utilization of fire as a resource management tool, the resulting pollutant emissions are expected to be relatively uncommon at a particular downwind location and of short duration. Air districts that allow the burning of materials related to the growing or harvesting of crops and which are emptied in the field, such as fertilizer and pesticide sacks or containers, will need to ensure that such activities comply with applicable State and federal requirements for their destruction or disposal.

The smoke impacts to fireline personnel as a result of either a prescribed fire or the management of a wildfire would be addressed in the environmental analysis of the specific burn project.

10. Noise

The proposed Guidelines are not expected to directly result in an increase in existing noise levels at affected sites. To the extent that air districts require greater use of mechanical treatments of forest fuels, there may be some increase associated with equipment used on site, e.g., tractors, masticators and chippers. However, any adverse impacts associated with selection of such treatments would be evaluated as part of the environmental analysis conducted by the burner.

11. Public Services

The proposed Guidelines are expected to have some affect on local or regional fire districts that conduct, or assist State and federal agencies with prescribed burning. These fiscal impacts are covered in Chapter X, Economic Considerations.

12. Solid/Hazardous Waste Disposal

The proposed Guidelines are not anticipated to result in a substantial increase in the generation of solid or hazardous wastes for the reason stated under “Hazards” above. Therefore, potential adverse waste impacts are not expected to be significant.

13. Aesthetics

The proposed Guidelines are not expected to result in any new construction of buildings or permanent structures and thus would not cause adverse affects to scenic vistas.

14. Cultural Resources

Significant adverse impacts to cultural resources are not expected because the proposed Guidelines would not require destruction or alteration of any buildings or sites with prehistoric, historic, archaeological, religious, or ethnic significance.

15. Catastrophic Wildfires

Although the Guidelines may not directly reduce incidents of wildfires in the short term, we anticipate that they will affect how wildfires managed for resource benefits are conducted to account for health-related smoke impacts, as land managers work with affected air districts using a more collaborative approach. Overall, these improvements in the fire and smoke management processes should allow increases in prescribed burning to reduce excessive forest fuel levels and associated risk of catastrophic wildfires, while minimizing adverse impacts to public health.

Reducing the risk of catastrophic wildfires through well-managed prescribed burning and other management practices has air quality and public health benefits. For example, lightning fires in Plumas County in late August of 1999 spread through a steep canyon before they could be put out. The resultant smoke ultimately blew into the Sacramento Valley. The result was weeks of significant air quality deterioration for several million people. In a separate incident in October, wildfires resulted in severe health impacts to the population at the Big Bar Complex – Hoopa Indian Reservation and nearby Willow Creek in Trinity County. During a nine day period, the federal 24-hour PM_{10} standard was exceeded, with five of those days well above 420 $\mu g/m^3$.

Impacts on Federal Requirements and Policies

1. Prevention of Significant Deterioration

Portions of a state that attain federal ambient air quality standards for a specific pollutant (federal attainment areas), must prevent significant deterioration (PSD) of air quality. Historically, U.S. EPA has often regarded fires managed for resource benefits to be temporary activities. Particulate matter emissions resulting from fire activities

differ from particulate matter emissions generated by most other sources because they are generally short-lived. That is, the burning generally is carried out infrequently at a specific location (once every 5-20 years) and the duration tends to be short (approximately 1-2 days). Nevertheless, while fires managed for resource benefits generally are not subject to PSD permits, the emissions from such activities may affect the air quality in an attainment area. Under adverse conditions, the combined particulate matter emissions from increased fire activities and from other sources could possibly result in ambient concentrations that exceed the PSD threshold for particulate matter. However, exceedances of the federal ambient air quality standards are expected to be relatively uncommon at a particular location and of short duration.

The U.S. EPA has indicated in their Interim Policy on Air Quality on Wildland and Prescribed Fires (Interim Air Quality Policy) that they generally support the concept of allowing states with approved SIPs to exclude emissions caused by temporary managed fire activities from PSD analyses, provided the exclusion does not result in permanent or long-term air quality deterioration. Therefore, the State will consider the extent to which prescribed burning activities can be expected to occur in a particular area with some regularity over a period of time.

2. Natural Events Policy

The Natural Events Policy (NEP) is a U.S. EPA policy statement outlining how states will protect public health in areas where the NAAQS for PM_{10} are violated due to exceptional natural events, including volcanic eruptions and seismic activities; wildfires; and high wind events.

Pursuant to the policy, the State must develop a Natural Events Action Plan to address exceedances to the PM_{10} standard that occur as a result of a natural event. ARB is currently working with air districts to identify PM_{10} exceedances that may have been caused by natural events and will submit its findings to U.S. EPA.

3. Visibility/Regional Haze Requirements

The U.S. EPA's visibility regulations protect federal parks, monuments, and other pristine areas both from manmade impairment that may be attributable to a single emission source or group of sources and impairment from a number of sources located in a broad geographic region. Under U.S. EPA's regulations, states must take appropriate action to address all identified sources of visibility impairment, including fires. Pursuant to federal Regional Haze rules that were promulgated in 1999, the ARB will address the impacts of fires and other contributing sources on reasonable progress in regional haze plans that will be developed over the next several years, as well as during periodic progress assessments.

It will be the responsibility of air districts to evaluate the potential impacts of prescribed burning to ensure that air quality concerns, including regional haze and visibility, are adequately addressed in the public land use planning process. In addition, ARB intends to participate in the environmental analysis process that is conducted by FLMs. We hope to use the process established with the USFS through the 1999 Memorandum of Understanding as the springboard for further involvement and cooperation in the fires and fuels management program for federal public lands.

X. ECONOMIC CONSIDERATIONS

The ARB identified the following financial and economic impacts of the proposed changes on State and local air and fire management agencies as well as on the private sector.

Costs

During the public workshops on the proposal, most of the participants representing the prescribed burners assured us that they already complied with burn requirements that were equivalent to the proposed Guidelines. However, several air districts indicated that the proposed Guidelines would substantially affect the way they administer the smoke management program in their areas. These changes in the way of doing business would likely result in additional costs for program administration and oversight, including increased coordination and consultation with burners, and determining the timing and amounts of specific burns, particularly in those areas that will face significant increases in prescribed burning.

In addition, the air districts raised concerns about additional costs to burners that may result from the proposed Guidelines that have not been included in the overall program costs. These additional costs include the costs attributable to cancelled burn projects. This situation occurs when, based upon a 48-hour forecast, burn crews mobilize on the day of the burn only to be told that morning that the burn must be cancelled because current meteorological and air quality conditions are not conducive to burning. We recognize that such costs may occur on occasion, but believe the forecasting and planning functions within the proposed Guidelines are sufficient to minimize the occurrence of such events, and in turn, the costs.

Air district fee programs do not fully recover costs for administering current agricultural burning requirements. Program enhancements therefore would need to be funded through an additional revenue stream, including permit fees that would be imposed on the burners. The ARB is committed to working with all stakeholders, including air districts and affected sources, to fully fund smoke management programs and to find reasonable cost savings without sacrificing health-related benefits of the program. One way is to achieve closer cooperation, perhaps through memoranda of understanding, between the ARB and air districts, FLMs, commercial timber owners and growers. Such agreements would establish formal working partnerships that reinforce the mutual goals contributing to forest and public health and reduce duplicated efforts. We will also work with the air districts and the burners to explore new avenues of funding to the extent that permit fees cannot reasonably recover the total cost.

1. Air Districts

In response to a request from the ARB, the California Air Pollution Control Officers Association compiled information from 19 of the 35 air districts on anticipated

additional costs of complying with the proposed Guidelines. Relevant portions of the survey are contained in Table 5. While these numbers were incomplete and only a rough approximation of anticipated costs, we believe that air districts may have to increase permit fees if additional sources of revenue are not identified.

Extrapolating from the information provided by air districts identified in Table 5, we estimate that cumulative start-up costs to the air districts could range from $2.5-2.8 million. Again extrapolating from the information provided by air districts identified in Table 5, we estimate additional expenditures of approximately $2.4-2.7 million per year in annual operating costs to participating air districts. These costs would be largely attributable to increased coordination and oversight responsibilities necessary to track anticipated increases in prescribed burning.

Table 5. Estimated Additional Costs to Air Districts to Comply with Proposed Guidelines

District	Existing Requirements	Proposed Guidelines	
	Costs Recovered From Fees (%)	Start-Up Costs ($1,000s)	Annual Operational Costs ($1,000s)
San Joaquin	70	1300*	989
Bay Area	0	666	566
San Diego	0	180	60
Northern Sonoma	0	72	52
Mendocino	0	48	32
Butte	50	35	170
Santa Barbara	0	35	70
Northern Sierra	15	32	105
Ventura	0	32	87
North Coast	0	27	48
Imperial	25	25	161
Sacramento	30	25	5
San Luis Obispo	0	12	23
Amador	0	9	6
Tehama	3	8	11
Kern	0	8	6
Shasta	5	7	13
Lassen	0	1	1
Yolo-Solano	60	--	47
TOTAL		**2522**	**2452**

*The air district considered this cost estimate to be in the upper range of anticipated costs, and could be substantially less based on the effectiveness of the forecasting and tracking tools developed.

The estimates varied from region to region; those whose oversight responsibilities would remain essentially the same estimated moderate increases to their annual budget ($5,000-48,000), while air districts that expected to incorporate additional requirements for prescribed burning, and enhanced forecasting tools estimated significant increases ($161,000–990,000).

First time program development costs would depend on several factors, including the current status of air district compliance with the new or proposed Guidelines, air district plans to enhance their existing program, anticipated equipment purchases, and contractual support.

In an effort to reduce costs, we are working with the air districts and the USFS to install an interactive computer-based system to track prescribed fires in the State. This automated system should help to reduce the costs currently needed to plot and estimate the impacts of planned and actual burns to determine if additional projects can be safely authorized. We expect the program to be operational by the end of the year. In addition, we plan on working with our federal partners to identify areas of cost-sharing and in-kind services in which federal fuels management and smoke management expertise can be utilized as part of the collaborative approach that the Guidelines envision.

The State is aware of the costs that State requirements will likely impose on air districts and that the existing agricultural burning program does not appear to be self-sustaining in any air district. For these reasons, we are committed to working with the air districts to seek ways to fully fund the smoke management program.

Although the ARB will work closely with air districts to reduce the overall cost of the program, it will be the air districts' responsibility to fully comply with the Guidelines. As provided by State law, air districts have the authority to recover the costs of complying with State requirements through assessing fees on sources that engage in agricultural burning (i.e., private landowners and FLMs). Therefore, any additional administrative costs resulting from an air district's program that are not recoverable by State subvention funds should be financed through air district fees.

2. Fire Districts

In several counties in the State, fire districts perform the dual duties of burn permit agencies and prescribed burners; in this situation, there may be some additional costs associated with burn plan monitoring and reporting requirements contained in the State rule. However, the proposed amendments do allow air districts to specify different burn plan thresholds. In some areas, this flexibility should keep overall costs of fire districts to current or otherwise acceptable levels. In other areas, fire district costs could increase; in these areas, fire districts may be unwilling or unable to continue to implement program elements, and these elements would default to the respective air district. In the event of cost overruns directly associated with State regulatory compliance, we will continue working with affected air and fire districts to address the

problem. However, air districts have indicated that existing fees will not fully recover the costs of program compliance. Therefore, air districts will likely find it necessary to impose or increase fees to burners.

3. State Agencies

The proposed Guidelines also affect the CDF, by requiring all designated fire agencies to prepare smoke management plans for air district review prior to prescribed burning. CDF believes its program to be functionally equivalent to that required by the proposed regulation. However, there may be costs due to cancellations for a burn project on the day of the burn, increased coordination during burn authorization, or from other aspects of the program such as public notification. In addition, air districts have indicated that existing fees will not fully recover the costs of program compliance. Therefore, air districts will likely find it necessary to impose or increase fees to CDF.

Expected increases in prescribed burning over the next several years will also require additional ARB resources to exercise adequate oversight. These resources have already been identified in the annual budget for 2001. Beyond these resources, it is not expected that additional direct costs would be incurred by the ARB because the proposed Guidelines do not impose additional requirements upon the ARB. Interaction between the air districts and the ARB should be within the normal course of activity and not require additional resources by the State beyond those already identified for 2001.

4. Federal Land Managers and the U.S. Military

Many of the prescribed burns conducted by the FLMs, including the U.S. military that manage prescribed burning at military installations in California, are likely to be greater than 100 acres. Therefore, under the proposed Guidelines, federal smoke management plans would need to include specific contingency actions that would be taken if smoke impacts occur or conditions deviate from the approved prescription. If a project is expected to burn more than 250 acres or if a burn is expected to continue overnight or over several days near smoke sensitive areas, the smoke management plan would also be required to include appropriate project monitoring as determined by the air district.

The FLMs in various workshops commented that their own procedures call for detailed smoke management plans and appropriate monitoring. However, they were concerned that our duplicative requirements might create additional and unnecessary paperwork. We intend to work with air districts and the FLMs, including those military bases that conduct prescribed burning in California, to avoid any duplication of effort while ensuring that our requirements are met. However, there may be costs due to cancellations for a burn project on the day of the burn, increased coordination during burn authorization, or from other aspects of the program such as public notification. As stated previously, because most districts do not appear to recover the full cost of their smoke management program from fees, any additional implementation costs which are

not recoverable from other funding sources may have to be passed along to the burners, by way of higher permit fees.

We will also work with all stakeholders to reduce costs through a combination of technical assistance provided by ARB, cost-sharing and in-kind services with our federal partners, and greater reliance on automated tracking systems that we are developing.

5. Crop Waste and Grazing Operations.

In our analysis, we assumed that the existing Guidelines would not change requirements governing burning used for crop waste or grazing operations. However, more complicated smoke management systems that involve greater coordination between prescribed burning and agricultural operations such as that anticipated in the San Joaquin Valley may result in changes in the process by which burns are approved. In addition, in areas that do not currently have a burn-specific authorization or allocation system, there may be costs due to cancellations for a burn project on the day of the burn, increased coordination during burn authorization, or from other aspects of the program such as public notification. This may result in increased operations costs to the air district. Because air districts do not fully recover the cost of their smoke management program from fees, any additional implementation costs that are not recoverable from other funding sources may have to be passed along to burners, including potentially growers.

6. Private and Commercial Timber Operations

The proposed Guidelines would require registration, smoke management plans, and reporting of prescribed burns that are conducted by private owners and contractors on private and commercial forest lands. This could impose additional requirements on industrial forest landowners (40-50), potentially some non-industrial forest landowners of 40 acres or more who choose to conduct their own burning, licensed timber operators, private forest fuel management contractors, and those ranchers and farmers that derive part of their revenue stream from the management and sale of timber. These impacts would primarily be felt in those portions of northern California that rely on timber harvesting, but other portions of the State that derive a portion of their revenues from timber sales could also experience some cost impacts. Private grazing operations may also experience higher permit fees if fire districts that conduct prescribed burns for these lands decide to pass along additional costs to comply with the State regulation.

Based on discussions with the California Forestry Association, we estimated that any additional costs would be spent on burn plan analysis, documentation, reporting requirements, and local permit fees. The Forestry Association assumed that each year, approximately 25,000 acres of industrial forest lands and 7,000 acres of non-industrial forest lands would require a burn permit. These costs were estimated to run about $15 per acre and would not include the additional costs associated with potential delays or cancellations from declaring a no burn day on the day of the burn, which would have affected the industry even under the existing Guidelines. Assuming a private land burn

program of 32,000 acres annually, the total additional cost to forest landowners could amount to $480,000 per year.

In addition, as indicated previously, there may be additional costs to burners that may result from the proposed Guidelines that have not been included in the overall program costs. These additional costs include the costs attributable to cancelled burn projects. This situation occurs when, based upon a 48-hour forecast, burn crews mobilize on the day of the burn only to be told that morning that the burn must be cancelled because current meteorological and air quality conditions are not conducive to burning. We recognize that such costs may occur on occasion, but believe the forecasting and planning functions within the proposed Guidelines are sufficient to minimize the occurrence of such events, and in turn, the costs.

Potential Impact on Employment

As stated above, the cost of the proposed Guidelines to private and commercial timber operators are expected to be around half a million dollars per year. This cost is not expected to have a significant impact on California employment, considering the size of the forest products industry. In 1992, the industry employed nearly 258,000 persons, representing about 1.87 percent of total employment in California. A minor change in employment as a result of the Guidelines would not likely affect the employment in California.

The proposed Guidelines may actually create some jobs in California as air districts ramp up their operations to meet the requirements of the Guidelines.

Potential Impact on Business Competitiveness

The increased costs of the proposed Guidelines are expected to have no noticeable impact on the ability of the California forest industry to compete in the national market. In 1992, the industry reported sales from production and processing of about $12.6 billion. The increased costs account only for 0.004 percent of the value of timber sold by California's forest industry. A negligible increase in the price of timber is unlikely to dampen the demand for California timber nationally. Besides, much of California's timber is consumed locally. Some 68 percent of the timber harvested in California is consumed within the State. Of the remaining 32 percent, about 29 percent is consumed by the rest of the U.S and nearly 3 percent is exported to other countries. In turn, about 70 percent of California's lumber consumption is imported from other states.

The proposed Guidelines may actually increase the competitiveness of timber production in California. The Guidelines intends to improve vegetation management, thus reducing the numbers of dangerous burns that may result in destruction of merchantable timber, personal property losses and loss of life. This implies that California timber production could rise if some catastrophic wildfires can be prevented, resulting in a reduction in the price of timber.

Potential Impact on Business Creation, Elimination, or Expansion

The proposed Guidelines would have no noticeable impact on the status of businesses in California's forest products industry. The industry's contribution to the California economy is marginal, accounting for less than 2 percent of the State personal income and jobs in 1992. However, the industry has a much larger impact on the economy of the Northern California counties because of its concentration in those counties. In 1992, for example, it accounted for about 18 percent of personal income and 23 percent of jobs in northern California.

The Guidelines would potentially result in a negligible increase in the price of timber in California. A small price increase is unlikely to dampen the demand for California timber. Most timber operators could absorb the costs of the proposed Guidelines with no significant impact on their profitability. However, the Guidelines may impose hardship on some small and marginal timber operators, especially in Northern California counties.

APPENDIX A

PROPOSED REGULATION ORDER