

San Joaquin Valley Unified Air Pollution Control District

PROPOSED SMOKE MANAGEMENT PROGRAM

Rules, Policies, and Procedures to Comply with the California Code of
Regulations Title 17 Smoke Management Guidelines for Agricultural and
Prescribed Burning

June 20, 2002

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I. BACKGROUND

A. Purpose

The purpose of the San Joaquin Valley Unified Air Pollution Control District's Smoke Management Program (SMP) is to manage smoke caused by open burning, including prescribed and hazard reduction burning, protect public health, ensure compliance with air district rules, policies and procedures, and meet the requirements of the California Code of Regulations, Title 17, *Smoke Management Guidelines for Agricultural and Prescribed Burning*.

B. Authority

The San Joaquin Valley Unified Air Pollution Control District (District) is a duly constituted unified air pollution control district, as provided in California Health and Safety Code (HSC) Sections 41050 to 40161. The District is authorized by California Health and Safety Code Section 40702 to make and enforce all necessary and proper orders, rules, and regulations to accomplish the purpose of Division 26 of the HSC. Further, the SMP was prepared pursuant to Section 41863 of the HSC and Subchapter 2, Smoke Management Guidelines for Agricultural and Prescribed Burning of Title 17 of the California Code of Regulations. Section 80155 of the latter directs the District to develop and submit a SMP to ARB for its review and approval.

On June 21, 2001, the District amended Rule 4103 (Open Burning)(Appendix A) and adopted Rule 4106 (Prescribed Burning and Hazard Reduction Burning) (Appendix B). These rules permit, regulate, and coordinate the use of open burning, prescribed burning, and hazard reduction burning. On February 27, 2002, the United States Environmental Protection Agency (EPA) made an interim final determination that the rules meet federal Best Available Control Measure (BACM) requirements. In addition, the District's Compliance Division has developed Prescribed Burning and Open Burning Policies to assist in the implementation of the rules.

C. District Characteristics

1. General

The San Joaquin Valley Air Basin (SJVAB) is comprised of eight counties: Fresno, Kern (western and central), Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Cumulatively, these counties represent approximately 16 percent of California's geographic area), making this area the second largest air quality basin as delineated by the California Air Resources Board (ARB). The current population within the SJVAB is approximately 3.2 million people. Based on California State Department of Finance projections, the population in the SJVAB is expected to grow to 3.6 million by 2005, to 4 million by 2010 and to 4.9

million by 2020. Major population centers include Fresno, Bakersfield, Modesto, and Stockton.

2. Attainment Status

The San Joaquin Valley Air Basin is designated as severe nonattainment for the national and California one-hour ozone standards and as serious nonattainment for the national one-hour and 24-hour PM10 standards and as nonattainment for the California PM10 standards.

3. Geography and Topography

California is divided into regional air basins according to topographic air drainage features. The SJVAB consists of a continuous intermountain valley approximately 250 miles long and averaging 80 miles wide. Approximately 17% of the SJVAB, (almost 2.6 million acres) is above 6,000 feet in altitude. On the western edge of the Valley is the Coast Mountain range, with peaks reaching 5,020 feet, and on the east side is the Sierra Nevada range with some peaks exceeding 14,000 feet. The Tehachapi Mountains form the southern boundary of the Valley. This mountain range includes peaks over 6,000 feet, and contains mountain passes to the Los Angeles basin and the Mojave Desert. The valley is basically flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Straits where the San Joaquin-Sacramento Delta empties into San Francisco Bay. The San Joaquin Valley (SJV), thus, could be considered a "bowl" open only to the north. Figure 1 provides an aerial view of the SJV and demonstrates the bowl created in the southern end of the SJV.

Marine air generally flows into the basin from the San Joaquin River Delta, but the region's topographic features restrict air movement through and out of the basin. The Coastal Range hinders wind access into the valley from the west, the Tehachapi Mountains prevent southerly passage of airflow, and the high Sierra Nevada range forms a significant barrier to the east. Additionally, most of the surrounding mountains are above the normal height of summer inversion layers (1,500-3,000 feet). These topographic features result in weak airflow. Depending on the large scale weather patterns, there are areas where air flows out of the valley. These air exits include the Tehachapi Pass into the Mojave Desert, and to a lesser extent over the Tejon Pass and perhaps into the Cuyuma Valley. The wind pattern produces conditions that result in poor horizontal dispersion of pollutants. During high-pressure events over the SJVAB, pollutant dispersal is also limited vertically by inversions. As a result, the SJVAB is highly susceptible to pollutant accumulation over time.

Because of the prevailing wind patterns, pollutants are generally transported, from northwest to southeast in the valley; however, localized winds also influence transport. During high pressure events, the seabreeze is sometimes inhibited by east winds aloft. Due to the blocking effect of the Sierras and coast range eddys

form in the valley that result in recirculation of pollutants. The Fresno eddy is the most prominent closed wind flow circulation in the valley. This counter clockwise circulation, formed by northwest wind at the western edge of the valley, and southeast winds on the east portion of the valley, recirculates pollutants around the central portion of the San Joaquin Valley. There are also other smaller scale eddies in the valley that may effect pollutant recirculation.

4. Climate

In general, warm, dry summers characterize the SJVAB, with the high daily temperature readings averaging around 95°F. The Valley averages 106 days a year with 90°F or hotter, and 40 days a year with 100°F or hotter. The daily summer temperature variation can be as high as 30°F. The SJVAB also experiences mild winters, with some dense fog, some frost and occasional freezing hours. The average daily low temperature is 45°F. The average yearly mean temperature over a thirty-year period is 65°F. The SJVAB has an “inland Mediterranean” climate, averaging over 260 sunny days per year, because semi-permanent high pressure systems frequently establish themselves over the SJVAB, deflecting low-pressure systems that might otherwise bring rain and winds.

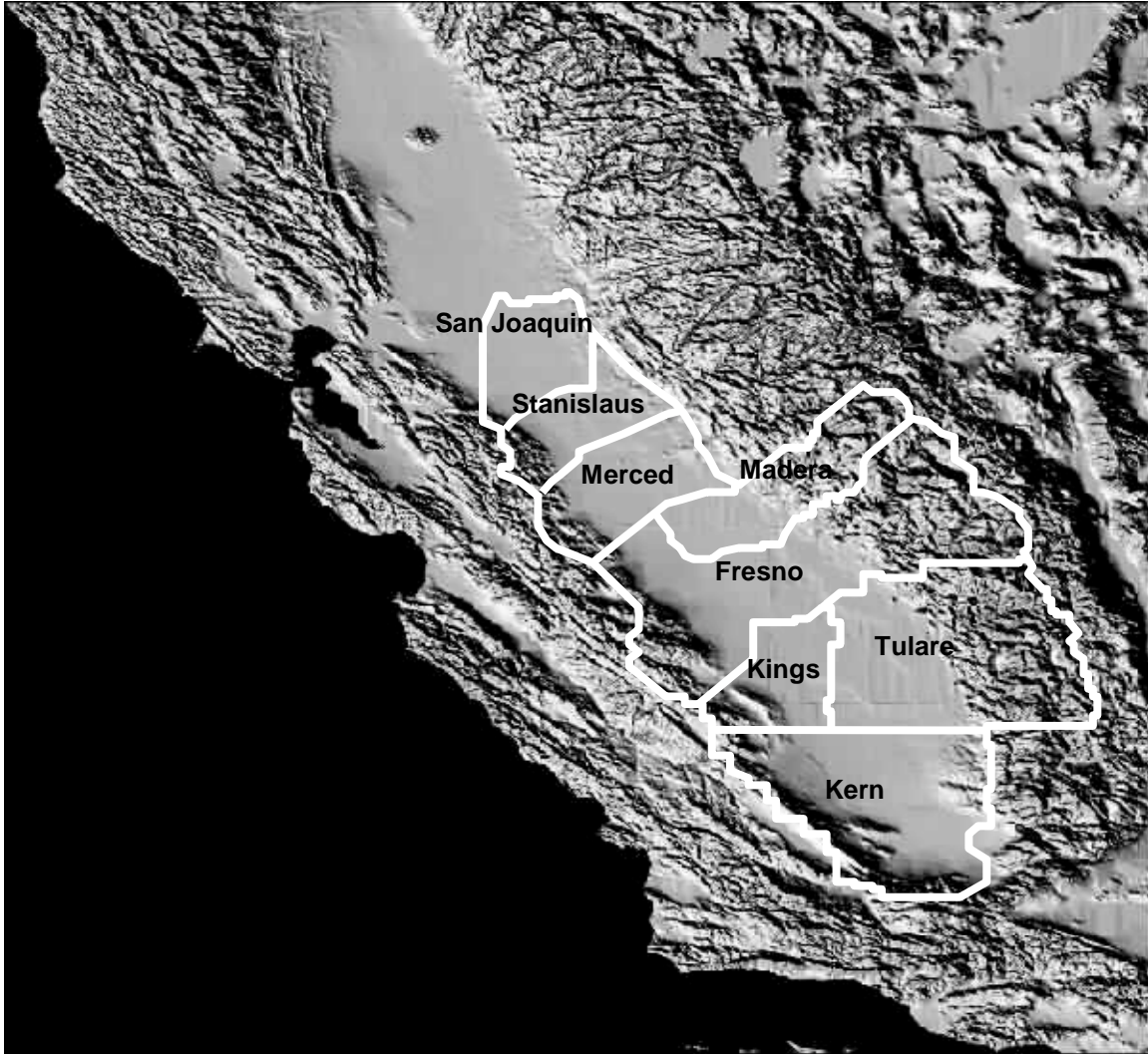
The coast range, Sierra Nevada, and Tehachapi mountains are also contained in the District. Precipitation, temperature, and wind characteristics vary greatly with elevation. Some areas in the District at higher elevations receive 60-70 inches of precipitation a year. During winter months, at elevations above 4000 feet, much of the precipitation falls as snow. During summer months, at high elevations, precipitation is generated from thunderstorms spawned from monsoonal moisture from areas southeast of California. In the mountainous complex terrain of the District, during high-pressure events, the heating and cooling of mountain slopes generate wind. In general, daytime winds are upslope with nighttime bringing drainage winds. These diurnal winds influence the transport of smoke in the region.

Precipitation in the SJVAB is confined primarily to the winter months with some usually occurring in late summer and fall. Average annual rainfall for the valley floor of the SJVAB is 9.25 inches.

5. Agricultural and Prescribed Burning

Both agricultural and prescribed burning occurs in the District on a large scale. Agricultural burning reported by burners for years 1997 through 1999 is shown on Table 1 and for prescribed burning by agency and acreage on Table 2.

FIGURE 1
SAN JOAQUIN VALLEY AIR BASIN



**TABLE 1
Agricultural Burning (in acres)**

CROP TYPE	1997	1998	1999	Total Acreage	Average	% of Total
Tree Pruning	508,921	499,205	508,585	1,516,711	505,570	68.5
Field Crops	65,982	85,430	73,370	224,782	74,927	10.0
Grape Stumps/Stakes	46,940	56,212	44,563	148,115	49,372	6.7
Orchard Removal	546	1,900	5,176	7,622	2,541	0.3
Other	127,889	102,199	113,113	343,201	114,400	15.5
TOTAL	750,278	745,346	744,807	2,240,431	746,810	100

D. Program Development

The District has operated a smoke management program since the adoption of Rule 4103, (Open Burning) in 1992. The rule regulated all open burning and established specific requirements for agricultural, field crop, range improvement, forest management, and wildland vegetation management burning. The District also approved an agricultural burning policy in November 1994 that assisted in the implementation of the program. The policy was revised and updated in April 1998.

The District's SMP basically required permits for agricultural burning, divided the District into three regions (north, central and south), and burn/no-burn days were called by region. It also established basic requirements for burning. In 1998, after a significant increase in prescribed burning was projected, District staff cooperatively with various land management agencies (LMAs) including the US Forest Service (Sequoia, Sierra, and Los Padres National Forests), US National Park Service (Sequoia-Kings Canyon National Parks), Bureau of Land Management, US Fish and Wildlife Service, California State Department of Forestry and Fire Protection (CDF), and the California State Department of Parks and Recreation (CDPR), developed a Memorandum of Understanding (MOU). The MOU was designed to primarily serve as a smoke management program to reduce PM10 emissions from controlled (prescribed) burns. Its provisions provide flexibility for the LMAs to utilize management practices that meet or exceed BACM required within serious PM-10 nonattainment areas. Because the California Air Resources began the process of amending Title 17 shortly after the approval of the MOU by the District and LMAs, the MOU was not fully implemented and has lapsed. The District and the LMAs will revise and renew the MOU as necessary to be consistent with Title 17

TABLE 2
Prescribed Burning 1996-1999 (in acres)

CDF	694	850	0	1,544	515	2.9
Kern Co. Fire	1,198	0	0	1,198	399	2.2
SoCal Ed	810	450	675	1,935	645	3.6
Cal Fish & Game				0	0	0.0
Total						
SEKI NP	3,276	2,152	5,758	11,186	3,729	20.9
Yosemite NP			8	8	3	0.0
Sierra NF	3,802	7,067	4,727	15,596	5,169	29.2
Sequoia NF	2,845	6,650	6,588	16,083	5,361	30.1
Los Padres NF				0	0	0.0
Inyo NF				0	0	0.0
BLM	1,000			1,000	333	1.9
USFW	1,624	776	1,900	4,300	1,433	8.0
LNAS		116	457	573	191	0.8
BIA				0	0	1.1
Total	15,249	18,061	20,113	53,423	17,808	100

and Rule 4106 and to address other issues related to the implementation of the Smoke Management Program.

Most counties in the SJVUAPCD charged fees for agricultural burning, but not for prescribed burning, prior to the formation of the District. In 1992, the District adopted Rule 3040, Agricultural/Open Burn Fees charging uniform fees for agricultural burning through the SJVAB. Since 1997, the fee has been \$22 for one location, \$38 for two locations, and \$62 for three or more locations. The District had started the development of a rule to assess a fee for prescribed burning prior to ARB's amendment of Title 17.

The District put its efforts on hold until ARB completed the amendments to Title 17. After the ARB's approval of the amended Title 17 in 2000, the District adopted Rule 3160, Prescribed Burning Fee, which established a \$5.00 per acre per year fee for prescribed burning, with the first 40 acres burned by an agency or person each year exempted. In combination with the fees charged for agricultural burning and District funding from other sources, prescribed burning fees are being used to implement the District's SMP.

Because the District was under an EPA sanction clock for a limited approval/disapproval finding for Rule 4103 (Open Burning), in June 2001, the District amended Rule 4103 (Open Burning) and adopted Rule 4106 (Prescribed Burning and Hazard Reduction Burning). The actions moved prescribed burning and hazard reduction regulations from Rule 4103 to Rule 4106 and included provisions in both rules to resolve EPA's limited approval/disapproval concerns and to incorporate Title 17 requirements.

Title 17 requires that the District develop this SMP. Rules 4103 and 4106 and other SMP requirements in Title 17 are incorporated into the SMP.

E. Document Organization

This SMP is divided into 10 sections, each addressing a specific topic. These sections are briefly described here.

Section 1, "Introduction" briefly describes the purpose of the SMP, the District's authority to implement and enforce the Program, local conditions, and provides background on program development.

Section II, "Program Resources" discusses the District's personnel resources, meteorological resources and air quality monitoring resources that will be used to carry out the SMP.

Section III, "Procedures to Minimize Smoke" briefly describes the District's rules and regulations to achieve smoke minimization objectives, described in Title 17.

Section IV, “Smoke Management Planning and Permitting” presents the District’s burn permit procedures and smoke management plan requirements.

Section V, “Burn Decision Notification” sets forth the District’s procedures for burn notification (burn or no-burn days, 96-hour trend, 72-hour outlook, and 48-hour forecast notices, 24-hour authorization).

Section VI, “Procedures for Addressing Smoke Impacts” describes the District’s public notification requirements for burns with potential to impact smoke sensitive areas and for addressing potential cross-jurisdictional smoke impacts.

Section VII, “Consideration of Alternatives to Burning” briefly describes how the District will analyze and assess alternatives to burning on a periodic basis.

Section VIII, “Management of Naturally Ignited Wildland Fires” presents the District’s procedures for managing smoke from naturally ignited wildland fires occurring on permissive-burn, marginal-burn, and no-burn days.

Section IX, “Inspection and Enforcement” describes the District’s procedures to ensure compliance with the District’s SMP, including follow-up and action on public complaints.

Section X, “Reporting Requirements” briefly describes the District’s reporting procedures required by sections 80130 (a) and (b) of Title 17.

II. Program Resources

A. Personnel

The SMP will be implemented using staff from various divisions within the District. The District currently has four staff members who focus on meteorological, modeling, air quality, and programming issues. These include a supervising meteorologist, two air pollution meteorologist/modelers, and an air pollution meteorologist. These staff members have the education, experience, and backgrounds that enable them to do the appropriate meteorological analyses and air quality and smoke management forecasting necessary to operate the program.

Because the District has operated a burn program for several years, it also has the personnel resources necessary to enforce the program. Staff includes one full time senior air quality inspector who specializes in agricultural and prescription burning activities by coordinating all open burn activities, and one air quality inspector, on a half-time basis, who specializes in agricultural burning and prescribed burning during the season. In addition, the District has 37 air quality inspectors and eight senior air quality inspectors whose primary assignment is to inspect stationary sources, but who also inspect open burn sites as a routine

surveillance activity. Other staff includes nine office assistants who issue agricultural burn permits and agricultural burn authorizations and five air quality assistants whose primary responsibility is to inspect potential open burn sites for permit eligibility. They may also investigate open burn complaints.

The implementation of the SMP will also require the use of various computer systems and software that must be installed and maintained. The District has a fully staffed information services division with expertise that will meet the needs of the program.

B. Meteorological Resources

The District has access to a full range of meteorological resources. The tools currently available to the District, described in Table 3, are used for both quantitative and qualitative forecasting of smoke transport. Other tools will also be used or may replace some of these tools as they become available.

C. Air Quality Monitoring Resources

The District, ARB and various land management agencies operate monitoring networks in the San Joaquin Valley which provide data used for determining basin wide meteorological and air quality conditions. The existing monitoring stations, including by whom they are operated and what pollutants are monitored, are shown on Figure 2.

III. PROCEDURES TO MINIMIZE SMOKE

A. Smoke Minimization

Section 80145(o) of Title 17 requires that rules and regulations be adopted by the District that include specified provisions to minimize smoke from all burning. On June 21, 2001, the District's Governing Board amended Rule 4103 (Open Burning) and Rule 4106 (Prescribed Burning and Hazard Reduction Burning). The requirements are addressed in the rules shown on Table 4.

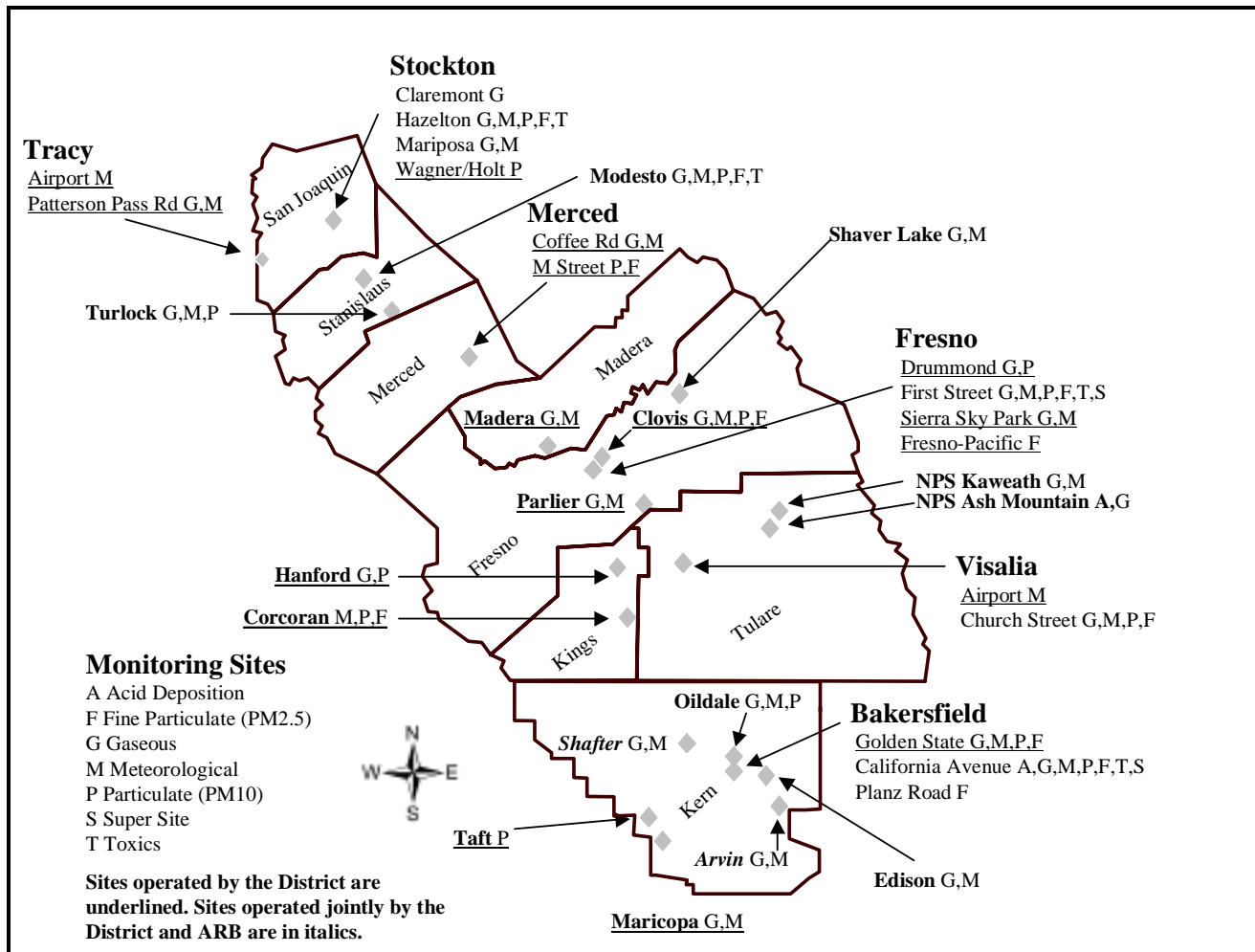
Section 80150 of Title 17 requires that the rules and regulations be adopted by the District that apply to open burning in agricultural operations in the growing of crops or raising of fowl or animals. The District's requirements are located in Section 5.5.11 of Rule 4103 which reflects the language located in Sections 80150 (a) (1) and (2) and (c) (1) through (3) of Title 17.

Title 17 also requires that alternatives to burning be considered in smoke management programs. Alternatives to burning requirements are addressed in Section VII of this SMP.

**TABLE 3
Meteorological Resources**

Resource	Brief Description	Application
Meteorological and Forecast Data Acquisition	Synoptic forecast, surface & upper air, satellite image graphics, and other meteorological data acquisition (MARTA system)	Synoptic meteorology analysis, upper air data, surface observations, inputs to statistical models
Profilers	District operated Lower air profilers at Visalia and Tracy	Determination of upper air smoke transport and dispersion
Wind and temperature analysis software	In-house interpolation program for temperature, wind, and pollutant field	Visualization of pollutant and wind fields
PM and ozone forecasting software	Provides statistical PM forecasts, Includes quantitative assessment of Title 17 meteorological criteria	Used as guidance for determining burn decisions, exceedances of federal standards precludes permission for burn days
Aircraft temperature soundings	ARB aircraft and pibal sounding	Assessment of stability and transport, data is input into a PM and ozone forecasting program
GIS	ARCVIEW and ARCINFO	Used to visualize burns and smoke plumes
In-house application of grid modeling	SJVUAPCD applies the SARMAP and the model generated meteorological data	Uses meteorological model generated wind fields to analyze the fate of smoke plumes in the valley; effects of smoke on ozone concentrations
EMC data acquisition system	Data acquisition system for ARB and District monitoring sites including meteorological parameters	Determination of surface smoke transport, visual plots of meteorological and temperature data, the system also disseminates specified pollutant and meteorological data over the internet

FIGURE 2
San Joaquin Valley Monitoring Stations



B. Procedures For Prioritizing Agricultural Burning, Including Prescribed Burning [Section 80145 (m) Requirements]

Under the District's smoke management program, the SJVAB will be classified into regions, the number of which will be determined by the topographical, geological and meteorological conditions in the SJVAB. As described in Section V, Parts D and E, burning will be allocated by region, depending upon each region's carrying capacity for smoke on each day. Not every burner who wants to burn on a given day may be able to do so. Therefore, the District must establish a system for prioritizing burning within each region.

Because of the general locations where agricultural and prescribed burning activities tend to occur, combined with the topography, geology, and weather conditions in the SJVAB, it is expected that the regions will fall into three categories: regions where only prescribed burning will occur, regions where only agricultural burning will occur, and regions where both prescribed and agricultural burning will occur.

In regions where only agricultural burning will occur, the allocation will be on a first come, first served basis. However, burners who do not receive an allocation on a particular day will be placed on a waiting list for the following day(s). The District is establishing a procedure whereby burners on the waiting list will receive notification when their allocation is going to be available. The District is creating an automated telephone system (with human contact also available) to handle this process.

In regions where only prescribed burning will occur, the District will work in consultation with the land management agencies and other prescribed burners to determine priorities. Factors that will be taken into consideration include, but are not limited to, cumulative impacts, size of burn, fuel types and amounts, projected duration, proximity to sensitive receptors, the purpose of the burn, any history of delays, and other burn logistics. This process will be handled through the District's compliance staff in conjunction with the prescribed burners.

Historically, there has been relatively little prescribed burning in areas where agricultural burning occurs. Where it has occurred, the prescribed burning has generally been limited and of short duration. As the allocation system is developed, it is expected that there will be some regions in which both types of burning will occur. In these regions, the allocation system will primarily operate on a first come first served basis. Within this first come first served system, however, it is also recognized that there may be occasions where circumstances dictate that a particular burn will have priority. The District reserves the right to review and approve requests for priority burning. The approval of such requests is expected to be very limited and would be based only on exceptional circumstances.

IV. SMOKE MANAGEMENT PLANNING AND PERMITTING

A. Burn Permits

All open burning, as defined in Rule 4103, and prescribed and hazard reduction burning, as defined in Rule 4106, requires valid burn permits. Burn permit procedures are as follow:

1. Open Burning Regulated by Rule 4103
 - a. Permit applications are submitted to and permits are issued by the District's Compliance Division.
 - b. Permits are issued over the phone and via mail. They must be renewed annually. When applicable, renewals are mailed annually to the permittee.
 - c. An applicant for an agricultural burn permit must provide the following information:
 - Name, business or farm name (d.b.a.), mailing address, and phone number.
 - Burn location information.
 - The specific types of materials intended to be burned.
 - The total amount of crop acreage.
 - d. There is an annual fee per permit. Per District Rule 3040, in 2002 the annual fee is \$22 for one location, \$38 for two locations, and \$62 for three or more locations.
 - e. Submittal of applicable fees is dependent on the number of locations specified on the permit.
 - f. An inspection may be required prior to the final issuance of the permit.
 - g. Exemptions to the rule for no-burn day requirements are located in Section 4 of Rule 4103. There is a fee for burn day exemptions. Per District Rule 3040, in 2002 the fee is \$30 daily, per location.

TABLE 4
Section 80145 (o) Requirements

Title 17 (o)	Requirement	Rule 4103	Requirement	Rule 4106	Requirement
(1)	Material to be burned to be free of material that is not produced on the property or in an agricultural or prescribed burning operation. Material not to be burned includes, but is not limited to, tires, rubbish, plastic, treated wood, construction/demolition debris, or material containing asbestos	Section 5.5.4	Agricultural waste does not include and shall not be burned unless it is free of such items as plastic, rubber, ornamental or landscape vegetation, shop wastes, construction and demolition material, garbage, oil filters, tires, tar paper, broken boxes, pallets, sweatboxes, packaging material, packing boxes or any other material produced in the packing or processing of agricultural products, pesticide and fertilizer containers (except sacks, burned in the field where they were emptied).	4.1	Except as otherwise provided in this rule and/or Rule 4103, no person shall set, permit, or use an open outdoor fire for the purpose of disposal or burning of lawn clippings or other garden wastes, ornamental shrubbery, household wastes, petroleum wastes; demolition or construction debris; residential rubbish; garbage or vegetation; tires; tar; trees; woodwaste; or other combustible or flammable solid, liquid or gaseous waste; or for metal salvage or burning of motor vehicle bodies.
(2)	Require the material to be arranged so that it will burn with a minimum of smoke, when feasible	Section 5.5.1	Agricultural waste shall not be burned unless it is arranged in such a manner as to promote drying and insure combustion with a minimum of smoke production.	4.8	Vegetation shall not be burned unless it is arranged or loosely stacked in such a manner as to promote drying and insure combustion with a minimum of smoke production.
(3)	Require the material to be reasonably free of dirt, soil and visible surface moisture	5.5.3	Agricultural waste shall not be burned unless it is free of excessive dirt, soil, and visible surface moisture.	4.7	Vegetation shall not be burned unless it is free of excessive dirt, soil, and moisture.
(4)	Require the material to be cut and dried for minimum periods with separate specifications for certain types of materials	5.5.6	Prunings and small branches 3 weeks Large Branches –six weeks Field crops (see III-B) Other materials (see rule 4106)	4.9.6	Unless good management practices dictate otherwise, no brush or unwanted trees shall be burned unless they have been felled, crushed, or uprooted with mechanical equipment, have been desiccated with herbicides, or are dead for a minimum of six (6) weeks prior to the burn.
(5)	Regulate hours of ignition and burning	5.5.8 5.5.9	No agricultural waste shall be burned except during daylight hours No agricultural waste shall be added to an existing fire after 5:00pm.		
(6)	Limit the ignition of fires to approved ignition devices	5.5.2	Agricultural waste to be burned shall be ignited only with an approved ignition device.	4.6	Vegetation to be burned shall be ignited only with an approved ignition device.

- h. Restrictions related to burn permits are located in Section 6.1 of Rule 4103 and among other requirements are prior authorization to burn on a specified day and compliance with a particular day's burn system allocation for the region in which the burn site is located.
- i. Permits may be suspended, denied or revoked if the burning or proposed burning does not meet the conditions specified in Sections 5 (Requirements) and 6 (Administrative Requirements) of Rule 4103.
- j. A copy of the District's Agricultural Burn Permit is located in Appendix C.

2. Prescribed Burning

- a. All prescribed burning is subject to an approved smoke management plan.
- b. An approved smoke management plan shall serve as a permit for prescribed burning. The District's Compliance Division reviews and approves smoke management plans. Failure to abide by permit conditions is a violation of Section 41852 of the California Health and Safety Code and of District Rule 4106.
- c. Smoke management plans are subject to a per acre fee, with the first 40 acres burned by an agency or person exempted. Per District Rule 3160, the per-acre fee is \$5.00.
- d. Restrictions and requirements for prescribed burning are located in Section 5.2 of Rule 4106.
- e. A copy of the smoke management plan template is located in Appendix D.

3. Hazard Reduction Burning

- a. Hazard reduction burning permits are issued by the Fire Department having jurisdiction over the burn site in accordance with Public Resources Code 4291. Such permits serve as the permit required by Section 5.1.1 of the District's Rule 4106.
- c. The District does not charge a fee for hazard reduction burning.
- d. All hazard reduction burning is subject to the permit requirement. Failure to abide by permit conditions is a violation of Section 41852 of the California Health and Safety Code and of District Rule 4106.
- e. A copy of a typical fire department hazard reduction burn application is located in Appendix E.

- f. District's Hazard Reduction Burning Brochure, dispersed along with hazard reduction burning permits, is located in Appendix F.

B. Registration of Planned Prescribed Burns

Annual or seasonal registration of all planned prescribed burn projects greater than 10 acres or projected to emit more than 1 ton of particulate matter is required. In addition to prescribed fires ignited through human activity, the requirement covers areas being considered for potential naturally ignited wildland fires managed for resources benefits, with updates as they occur.

The registration for prescribed burns shall include a description of the project burn location, number of acres to be burned, the amount and type of fuels expected to be consumed by each burn project and who will conduct the burn.

C. Smoke Management Plan Requirements

Smoke management plans for all prescribed burns are required (Section 5.2 of Rule 4106). The requirements are summarized in Table 5. The District's smoke management plan template, which was developed in conjunction with the Title 17 Smoke Management Plan Working Group, is located in Appendix D.

V. BURN DECISION NOTIFICATION

A. Introduction

For purposes of smoke management, the San Joaquin Valley is currently divided into three regions: north, central and southern and the latter two are also divided into upper and lower elevation zones. Burn day notifications are tailored to each region and zone, and utilize specific procedures for both agricultural and prescribed burns. Potential burn declarations include:

- Permissive Burn Day. Burning is not prohibited by the ARB and burning is authorized by the District consistent with state guidelines and District rules, regulations and policies.
- No-Burn Day. Burning is prohibited by the ARB or the District. No burning is allowed to occur except that which is exempted by Rule 4103.
- Marginal Burn Days. Limited amounts of burning for individual projects in specific areas is allowed.

The goal of the burn day approval process is to coordinate agricultural and prescribed burns based on expected meteorological considerations and acceptable smoke emissions. For prescribed burns, the burn day process consists of three basic elements: 1) Permissive Burn Day Determination; 2)

**TABLE 5
Smoke Management Plan Requirements**

Size	Requirements
< 10 acres or projected to emit <1 ton of particulate matter	Section 5.2.1: Legal description, maps, type and amount of fuels, identity and mailing address of responsible personnel, including 24 hour telephone
> 10 acres or projected to emit > 1 ton of particulate matter	Section 5.2.2: All Section 80160 requirements, plus a description of wind speed and direction necessary for burning and the anticipated duration of project's smoke production from ignition to dawn.
> 100 acres or projected to emit > 10 tons of particulate matter	Section 5.2.3: All Section 80160 requirements, plus a description of the per acre fuel loading, including the fuel type, and anticipated fuel consumption; identification of the population in the potential smoke sensitive areas; description of BACM which were considered and the values or criteria that were used to determine the feasibility of these alternatives; description of how public will be informed of the possible effect of smoke and the duration of the effects; description of the type and frequency of the surveillance and/or monitoring that will be conducted to determine any smoke impacts to smoke sensitive areas.
>250 acres or projected to produce > more than 25 tons of particulate matter	Sections 5.2.4 and 5.2.5: All requirements Sections 5.2.1 through 5.2.3; monitoring; identification of smoke sensitive areas >than 25 miles if potential for smoke impacts appears to exist; description of surveillance, air monitoring methods, smoke complaint handling procedures, decision making process that will be used in implementing smoke mitigation procedures, responsive impact mitigations up to and including a declaration of a wildfire and aggressive fire suppression; and the anticipated duration of project's smoke production from ignition to burn down.
Projects that may impact smoke sensitive areas	Identical to Section 80160(d) of Title 17 (Section 5.2.5 of Rule 4106)

Meteorological Trend Forecasting, and 3) Daily Burn Approval/Notification. Smoke management plans (see Section IV, A, 2, a) provide essential information for assisting with the burn day notification process.

For agricultural burns, the burn day process consists 1) Permissive Burn Day Determination and 2) Daily Burn Approval/Notification. The two elements are discussed in further detail below. We expect the burn day approval process to evolve over time as we work with the ARB and burners to develop more quantitative decision-making tools.

B. Procedures for Issuing Notices of Permissive Burn, Marginal Burn, and No-burn Days for Agricultural, Prescribed Burning and Hazard Reduction Burning

Daily forecasts are and will continue to be a joint function of the District's meteorological and compliance staffs. The daily forecast will be based on both quantitative and qualitative meteorological forecasting techniques to determine permissive, marginal and no-burn days. As indicated in section IIB, the District possesses numerous meteorological and air quality forecasting tools and also consults with ARB meteorologists. These deliver quantitative guidance to the District forecaster for determining the burn day status. In addition to using the Title 17 meteorological criteria, the District forecaster will also base his recommendation on the burn day status on the review of synoptic conditions known to cause dispersion problems in the valley. The District forecaster will also consider PM_{2.5}, PM₁₀, and ozone forecasts in the decision making process.

Specifically, to determine recommendations on permissive, marginal, and no-burn days, our qualified staff of forecasters will use their meteorological expertise to review National Center for Environmental Predictions (NCEP) model prognostications, the uncertainty of those forecasts, surface and aloft temperature trends including ARB aircraft soundings, lower air profile data, local transport winds, marine air intrusion, subsidence and vorticity conditions, current and forecasted PM and ozone concentrations, current smoke complaints, and quantitative forecast parameters to derive the general agricultural burn declaration. As is currently practiced by our staff, meteorological parameters forecasted by the District for air quality forecasting and the burn program will be compared to the Title 17 criteria. In addition to the Title 17 criteria, the forecaster will use professional judgment regarding the forecast, by analyzing the factors above and the certainty of smoke dispersion's transport factors.

When the forecaster has prepared his recommendation to the compliance division, compliance staff will then take into consideration circumstances such as the accumulation of material to be burned following several no-burn days and localized impacts. Normally, the daily forecast will be issued by the District when this process is completed. On occasion, however, when meteorological

conditions or other circumstances so require, either the forecaster or the compliance inspector may declare the burn day status.

Burn day status notification will be issued through an automated system, with District personnel also available for those who prefer working with a person.

C. Procedures for Issuing 96-Hour Trend, 72-Hour Outlook, and 24-Hour Forecast Notices for Prescribed Burns

For prescribed burns, in addition to the factors described above, the forecaster will consider the proximity of the burn to populated areas, cumulative burn impacts relative to other planned burns in the area, including tonnage per acre and emissions, and localized drainage and slope wind flows. The forecaster will use the approved project smoke management plan for each burn project and work with the designated District inspector to assess these factors. For areas that are less smoke sensitive, the region-wide burn declaration will be used as the criteria for determining the trend, outlook, and forecast go or no-go declaration for specific projects. For areas that are more smoke sensitive or will produce large amounts of emissions, the decision will be based on the potential for the burn to produce localized impacts, while still considering the regional impacts. RAWS units and local lower air profiler data, when available, will be used to assess transport winds. As is currently practiced, the meteorological and compliance staff will evaluate the forecasted meso- and local-scale meteorological conditions and use professional judgment to assess the potential for smoke emissions to cause potential adverse impacts on smoke sensitive areas and/or health standard violations. The District inspectors and meteorologists will consider historical impacts of burning to population areas.

An ARB form (currently Form CB3 form, see Appendix G) altered to contain District specific information will be used for initial communication between prescribed burners and the District. The form assists in the determination of both burn day status and final go/no-go burn decisions. Contained on the form is the location, elevation, size, and expected burn rate associated with the project. As new technology is developed, other forms of communication may be utilized. Once received by the District, the forecaster will record the 96-hour trend, 72- and 48- hour outlook, and 24-hour forecast, and fax or e-mail the form back to the burning agency. These forecasts will continue until the date specified on the CB3 or until the project is completed. This form is also available on the District's website at www.valleyair.org.

D. Final Authorization of Agricultural and Prescribed Burning (Burn/No Burn)

For both agricultural and prescribed burning, no burning can be started unless authorized by the District on the day of the burning. For most prescribed burning, the proposed burner will have been receiving the 96-hour trend, 72- and 48-hour

outlook, and 24-hour forecast information from the District using the CB3 form. Although referred to as a 24-hour forecast, the information necessary to properly do the forecast is not available until the afternoon of the day prior to the start of a proposed burn. The forecast thus tends to become available in the later part of the afternoon. Upon request from any LMA who has submitted a CB3 form to the District, the District will provide a forecast the full 24 hours in advance of a proposed burn. However, as described below, any such forecast will be subject to change if so dictated by data that becomes available later in the day.

The 24-hour forecast serves as an initial go/no-go point for the prescribed burners. If the 24-hour forecast is a no-go, the proposed prescribed burn will not be allowed to proceed on the following day. If the forecast is a go, the burner may proceed with burn preparations on the assumption that burning can occur on the following day. All burn decisions based on a 24-hour forecast are subject to change if conditions affecting smoke dispersal are different from those anticipated. The burner must contact the District on the day of the burn to verify that conditions for the burn are still acceptable. The District may change the go to a no-go decision. Moreover, if conditions change after the burn is ignited, and burning cannot continue to occur within its prescription, the District can order the prescribed burner to cease ignition and implement the contingency measures in the LMA's smoke management plan.

Agricultural burning and any other permitted burning not utilizing the trend forecasting described above must also be approved for burning on the day of the ignition. Currently, burn/no-burn days are designated for the north, south, and central regions, and by altitude within the south and central regions. On a no-burn day in any region, no burning will be authorized in that region on that day except as allowed by Rule 4103. On a burn day in a region, burn permit holders must call the District to obtain an authorization, subject to their permit conditions. They must identify their permit number, the location of the burn, the number of acres they intend to burn, and the type of material that is going to be burned.

All burning in the SJVAB is subject to the District's burn authorization system described above. All permit holders, including prescribed burners, can only ignite their burns if the District has authorized their individual burns in their region that day.

On a day that the District has authorized and allocated burning to occur, fire agencies having authority over a burn site may suspend burning due to increased risk of fire danger.

E. Future Burn Allocation

An enhanced authorization system is needed in the San Joaquin Valley due to historical complaints, stockpiling of materials during long periods of no-burn days, concentration of burns in one area, and the new federal air quality standards.

Over the next year and half, the District plans to enhance its agricultural and prescribed burning authorization system to include an automated acreage allocation system. Development efforts will occur in three phases, with a prototype system in place by the fall of 2003. Refinements to the system will occur periodically thereafter. The enhanced allocation/authorization system will limit burns based on their locations, number, size, time of ignition, scheduled timing of burns, and potential cumulative emission impacts. Enhanced meteorological and fuel accumulation factors will be used. The goal of the program is to reduce local and regional smoke impacts, avoid smoke related complaints, and prevent exceedances of the federal ozone, PM-10 & 2.5 health standards. Implementation of the program will provide a sound technical basis for authorizing agricultural burning in the San Joaquin Valley.

For the first phase, as described above, the District will perform the tasks of declaring agricultural burn, marginal, and no-burn days. The District has already assumed the authority for declaring prescribed burn day decisions. The ARB will continue to have oversight authority over these declarations and can be more stringent, but not less stringent, in the declaration of burn status.

In the second phase, the District will work with the ARB and affected stakeholders to develop a qualitative allocation system where staff will consider meteorology, emissions, and material buildup factors to allocate the amount of burning that can occur in a region on a given day. In this phase, the SJVAB will be classified into smoke management regions. The regions will be set by performing source/receptor and meteorological representativeness analyses. District personnel have already begun this process by defining new ozone and PM forecast regions, using high-resolution data from the Central California Ozone Study (CCOS), California Regional Particulate Air Quality Study (CRPAQS), and SAQM modeling programs. Carrying capacity will be defined by amount of emissions that produces exceedances of the state and federal standards for PM10 and the federal standard for PM2.5. Once the zones are defined, analyses defining the particulate matter carrying capacity for each for given specified meteorological conditions will be prepared. This will be a quantitative assessment of each region's PM levels and emissions. In addition, the meteorology associated with potential impacts on smoke sensitive areas from agricultural and prescribed burning will be considered.

For the third phase, the District will include more quantitative forecast parameters, tracking of burns, and automated allocation of emissions to regions determined by smoke particulate source/receptor relationships.

The District is developing a system to distribute burn emissions to the various regions. Once burn allocation equations are in place there will be a limit or cap to each region's emissions for a given meteorology. The District is developing an automated call in system where burners can call to input their burn location, and

the amount and type of material to be burned. If the allocation is not exceeded in that region they will be given the authorization to burn.

VI. PROCEDURES FOR ADDRESSING SMOKE IMPACTS

A. Public Notification Requirements for Burns with Potential to Impact Smoke Sensitive Areas

Smoke management plans must include a description of how the public will be informed of the possible effects of smoke and the duration of the effects (Section 5.2 of Rule 4106). Copies of public information planned for release must be provided.

B. Procedures for Addressing Potential Cross-jurisdictional Smoke Impacts

The District has developed communication lines with surrounding jurisdictions, including contact names, telephone numbers and fax numbers. A form has been developed and will be used to convey pertinent information between and among jurisdictions. If smoke from a project may impact other Districts or states, District staff shall notify the appropriate air quality agency by faxing or by other electronic means the form as soon as practical and prior to ignition. Any concerns these agencies have over the planned burn will be incorporated into the authorization.

VII. CONSIDERATION OF ALTERNATIVES TO BURNING [SECTION 80145 (L)].

While allowing burning to reduce the fuel loading in wild land areas, the health impacts of smoke on sensitive receptors must also be considered. Prescribed fire may not always be the most appropriate tool to reduce or manage fuels in urban wildland interface areas.

A. Alternative Fuel Treatment Methods

1. All project smoke management plans must include a discussion of what Alternative Fuel Treatment Methods (AFTMs) were considered. In the District, AFTMs include biomass chipping, crushing, disking, mowing, selective logging, chemical treatment, and livestock grazing.
2. For projects greater than 100 acres in size, or that are projected to produce more than 10 tons of particulate matter, or that will continue overnight, or that will be conducted near smoke sensitive areas, the smoke management plan discussion must include the comparative values or criteria used to determine the feasibility of the AFTMs.

B. Best Available Control Measures (BACMs)

1. A smoke management plan must discuss what BACMs were considered and identify which are to be implemented to:
 - reduce the number of acres burned;
 - reduce pre-burn fuel loading;
 - lower the emission factor (e.g. pile burning, high intensity fire, etc.); and
 - reduce the fuel consumption.
2. Each smoke management plan must also include a description of the post-burn BACMs to be implemented to limit the duration of smoke impacts to smoke sensitive areas (e.g. mop-up).

VIII. MANAGEMENT OF NATURALLY IGNITED WILDLAND FIRES

As required by Title 17, when a natural ignition occurs on a no-burn day, the initial “go/no-go” decision to manage the fire for resource benefit will be a “no-go” unless:

- after consultation with the District, the District decides, for smoke management purposes, that the burn can be managed for resource benefit; or
- for periods of less than 24 hours, a reasonable effort has been made to contact the District, or if the District is not available, the ARB;
- after 24 hours, the District has been contacted, or if the District is not available, the ARB has been contacted and concurs that the burn can be managed for resource benefits.

A “no-go” decision does not necessarily mean that the fire must be extinguished, but that the fire cannot be considered as a prescribed burn.

Smoke management plans shall be submitted to the District within 72 hours of the start of any naturally ignited wildland fires managed for resource benefits.

IX. INSPECTION AND ENFORCEMENT

A. Prescribed Burning

A multi-agency response to information requests and complaint calls regarding regional air quality or localized smoke impact must be coordinated and conducted in a uniform manner according to the following policy and procedures.

1. Complaints Received by Agencies Other Than the District
 - a. Complaints must be referred to the District immediately upon receipt but no more than one hour. All complaints will be thoroughly investigated to determine their validity.
 - b. At a minimum the complaint format should include the following information: name, phone number, land location of the complainant, and description of the situation and area affected.
 - c. The smoke management plan must describe the agency's complaint routing procedure that will serve to notify the prescribed fire manager or burn boss of all complaints.
 - d. The Burn Boss must confer with the District to determine the need to implement the smoke contingency actions established in the smoke management plan.
 - e. The smoke management plan must outline the agency's procedure used to log all complaints in the project folder for review by the District.
2. Complaints Received by the District
 - a. Complaint Inspections will be assigned to the District's prescribed burn section for investigation. If the prescribed burn section inspectors are unavailable the complaint will be forwarded to a Central Office staff supervisor for assignment.
 - b. Individuals or agencies responsible for a burn must be made immediately aware of smoke complaints specific to the burn project or burn plan.
 - c. The District shall confer with the individual or agency to determine the need to implement smoke management plan established smoke contingency actions.

B. Agricultural Burning

1. Pre-Burn Inspections

An on-site inspection may be conducted for a new burn permit application or if a new site is to be added to an existing burn permit, to determine compliance with District rules and policies.

2. Observed Burns

Observed burns will be reviewed to ensure they were authorized by the District. A thorough inspection shall be conducted if the materials and/or observed smoke are questionable (e.g. if black smoke or any unauthorized materials are observed). If the burn is not an authorized burn, a notice of violation or a notice to comply, depending upon the circumstances surrounding the burn, will be issued.

If, in the opinion of the inspector, a burn is creating a potential fire hazard to person or property, or the fire is being conducted in violation of requirements stipulated by a fire protection agency, the inspector shall contact the applicable fire protection agency by the most expeditious means available.

3. Complaints

Complaints relating to burning shall be investigated. If the burn is not an authorized burn, a notice of violation or a notice to comply, depending upon the circumstances surrounding the burn, will be issued.

Without regard to the legal status of the fire, where smoke is creating a nuisance, the responsible party will be requested to extinguish the fire. If a responsible party is either unwilling to comply with the request for extinguishment or if they lack the resources the fire department may be requested to put the fire out. After an investigation the District shall determine whether any further compliance action is appropriate.

C. Hazard Reduction Burning

1 Hazard Reduction Burning Brochure

The District does not conduct pre-burn inspections of hazard reduction burn locations. However, all hazard reduction burning must meet the requirements set forth in Rule 4106, the District's Residential Hazard Reduction Burning Brochure, and any conditions established by the permit issued by the Fire Department having jurisdiction over the burn site.

2. Observed Burns

Observed burns will be reviewed to ensure they meet the conditions set forth in Rule 4106, the District's Residential Hazard Reduction Burning Brochure and any conditions established by the permit issued by the Fire Department having jurisdiction over the burn site. A thorough inspection shall be conducted if the materials and/or observed smoke are questionable (e.g. if black smoke or any non-vegetative materials are observed). If the burn is not an authorized burn, a notice of violation or a notice to comply, depending upon the circumstance\ s surrounding the burn, will be issued.

If, in the opinion of the inspector, a burn is creating a potential fire hazard to person or property, or the fire is being conducted in violation of requirements stipulated by a fire protection agency, the inspector shall contact the applicable fire protection agency by the most expeditious means available.

3. Complaints

Complaints relating to burning shall be investigated. If the burn is not an authorized burn, a notice of violation or a notice to comply, depending upon the circumstances surrounding the burn, will be issued.

Without regard to the legal status of the fire, where smoke is creating a nuisance, the responsible party will be requested to extinguish the fire. If a responsible party is either unwilling to comply with the request for extinguishment or if they lack the resources the fire department may be requested to put the fire out. After an investigation the District shall determine whether any further compliance action is required.

X. REPORTING REQUIREMENTS

A. Agricultural and Prescribed Burning

The District maintains a database for agricultural and prescribed burning. Data is recorded by County and includes the estimated tonnage and/or acreage of each

waste type burned from open burning in agricultural operations reported by each agricultural permit holder each year. The estimated tonnage from prescribed burning, by each prescribed burn conducted each year, is also recorded.

Based on this information, the report on agricultural and prescribed burning required by Section 80130 (a) of Title 17 is submitted to the ARB by the District's Compliance Division within 45 days of the end of each calendar year.

B. Special Permits

Agricultural burning is permitted on no-burn days, if the denial of such burning would threaten imminent and substantial economic loss, subject to the provisions of Section 4.3, subsection 4.3.3, of Rule 4103, APCO authorization, and permit requirements. Title 17, although not Rule 4106, also allows prescribed burning to occur on no-burn days if the denial of such burning would threaten imminent and substantial economic loss. Because of the Title 17 entitlement, District compliance staff will also consider this exemption on a case-by-case basis for prescribed burning. Hazard Reduction Burning for compliance with Public Resources Code 4291 may not be considered for the no-burn day exception. Applicants for such permits must report said burning and complete a signed application form that provides the reasons for requesting the exemption.

Based on this information, the report required by Section 80130 (b) of Title 17 will be prepared by the District's Compliance Division within 45 days of the end of each calendar year.

APPENDIX H

ACRONYMS

AFTM	Alternative Fuel Treatment Methods
ARB	California Air Resources Board
BACM	Best Available Control Measures
BLM	Bureau of Land Management
BIA	Bureau of Indian Affairs
CCOS	Central California Ozone Study
CDF	California State Department of Forestry and Fire Protection
CDFR	California Department of Parks and Recreation
CRPAQS	California Regional Particulate Air Quality Study
District	San Joaquin Valley Unified Air Pollution Control District
EPA	United State Environmental Protection Agency
GIS	Geographic Information System
HSC	California Health and Safety Code
LMA	Land Management Agencies
LNAS	Lemoore Naval Air Station
MOU	Memorandum of Understanding
NF	National Forest
PM	Particulate Matter
PM10	Particulate Matter, 10 microns or less in diameter
PM2.5	Particulate Matter 2.5 microns or less in diameter
SEKI	Sequoia Kings Canyon National Park
SJV	San Joaquin Valley
SJVAB	San Joaquin Valley Air Basin
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
SMP	San Joaquin Valley Unified Air Pollution Control District's Smoke Management Plan
SoCal Ed	Southern California Edison Company
USFW	United States Fish and Wildlife