Paul E. Helliker
Director

Department of Pesticide Regulation

Gray Davis
Governor

Winston H. Hickox
Secretary, California Environmental Protection Agency

June 26, 2001

TO: Interested Parties

SUBJECT: METHYL BROMIDE RISK MANAGEMENT PLAN FOR SEASONAL COMMUNITY EXPOSURES

On May 21, 2001, the Department of Pesticide Regulation (DPR) released its analysis of ambient air monitoring for methyl bromide, based on fumigant data collected during the latter part of 2000. The objective was to quantify seasonal exposure levels, identify potential risk management options, and develop a practical plan to reduce seasonal exposures to methyl bromide, consistent with DPR's mandate to make regulatory decisions using the best scientific evidence available.

Toward that goal, DPR called upon interested parties to review and comment on the analysis and risk management options. The Department appreciates your contributions to this process.

The attached plan describes a series of immediate actions to ensure adequate protection from seasonal exposures to methyl bromide. Supporting documents are also provided. If you are receiving this letter electronically, supporting documents are available on DPR's Web site at <www.cdpr.ca.gov>.

Sincerely,

(Original signed by)

Paul E. Helliker
Director
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Attachments

FLEX YOUR POWER! *The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web site at <www.cdpr.ca.gov>.*

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Methyl Bromide Risk Management Plan for Seasonal Community Exposures
June 2001

Summary:

After an in-depth staff analysis of methyl bromide monitoring and toxicology data and a review of comments on these data submitted by a number of interested parties, the Director of the Department of Pesticide Regulation (DPR) announces the following findings:

* Levels of methyl bromide detected in monitoring studies, while higher than DPR's seasonal reference concentration (.001 to .002 parts per million, that is, 1 to 2 parts per billion), are not at levels that pose an immediate health concern. However, DPR believes exposure levels over the long term should be reduced, and we should pursue measures to achieve the health goal.

* The correlation analysis of pesticide use and air concentrations is sound. The analysis points to only a few townships where methyl bromide use is both extensive and extended enough that ambient air levels may exceed the seasonal reference concentration. For example, in 1999, out of the 458 townships in the State where methyl bromide was used, only 17 met the high, extended-use criteria. Preliminary data show that in 2000, only 13 townships were in the high, extended-use category. (A township is a geographically defined area six-by-six-miles square.) We also understand that the primary areas of concern will be smaller than a township area.

* New regulations implemented this year have dramatically altered methyl bromide use practices. Among other things, they have lengthened the application season. Use restrictions are expected to reduce the amount of methyl bromide applied on any given day and, therefore, lessen seasonal exposure concerns.

* Federal law has reduced the supply of methyl bromide by 30 percent compared to last year, and 50 percent since 1999, raising application costs significantly.

* At the same time, new alternative fumigants have become available to farmers and are being increasingly used.

* Use of methyl bromide appears to be declining significantly in California, based on preliminary use reporting data from the 2000 season.

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In response to these findings, DPR is taking a series of actions to ensure adequate protection from seasonal exposures to methyl bromide. These measures will also provide a mechanism for additional controls, if necessary. This multifaceted approach to dealing with a complex issue has several elements:

* DPR is initiating a focused program this season with the county agricultural commissioners (CACs) and growers to reduce methyl bromide seasonal exposure in historically high-use areas.

* DPR is also requiring the registrants to conduct air monitoring in areas of highest seasonal methyl bromide use in California, which will allow DPR to complete a broader evaluation of community exposures.

* DPR will, in collaboration with the State Air Resources Board (ARB), conduct an air monitoring study similar to that which the two agencies conducted in 2000.

* DPR scientists will use the monitoring and other data to assess the impact of the new regulations on methyl bromide emissions and validate the correlation established between methyl bromide use and ambient air levels.

* CACs, in cooperation with DPR field staff, have embarked on a comprehensive program to educate methyl bromide users on the complexities of the new regulations to ensure they are fully and effectively carried out.

* DPR will work with CACs, growers, industry, and other interested parties to develop a methyl bromide phaseout transition strategy.

DPR will evaluate the results of these measures and impose additional regulatory controls if necessary. This has been DPR's programmatic and philosophical approach since it began tightening restrictions on methyl bromide use in 1992.

BACKGROUND:

Methyl bromide is a fumigant used to treat soil before planting, and most of the methyl bromide used in California is for this purpose. Methyl bromide is also used to protect harvested crops from pest damage during storage and transportation. In addition, it is used for eradication of wood-destroying pests in homes and other structures, and to control pests in mills, ships, railroad cars, and other transportation vehicles.

Most uses of methyl bromide are being phased out under an international treaty designed to protect the ozone layer. (Methyl bromide has been classified as an ozone depleter.) Under the

Federal Clean Air Act, all production and importation of methyl bromide must end in the U.S. by January 1, 2005. (This parallels a similar phaseout in the world's developed nations. The deadline for phaseout in undeveloped nations is 2015. More information on the international and national phaseouts is available on the U.S. Environmental Protection Agency's "Methyl Bromide Phaseout Web Site" <http://www.epa.gov/ozone/mbr/>. The exceptions to the phaseout are pre-shipment and quarantine uses, with other "critical use exemptions" yet to be defined. The Clean Air Act also has mandated interim supply reductions: 25 percent in 1999, 50 percent in 2001, and a 70 percent cut in 2003. Diminishing supplies have already doubled the price of methyl bromide for California farmers, according to the University of California (UC), and have made the use of the fumigant on many low-value crops uneconomical. (See the May-June 2001 issue of *California Agriculture* magazine, available online at <http://danr.ucop.edu/calag>.)

DISCUSSION:

Prompted by toxicology concerns, DPR has been tightening restrictions on methyl bromide since 1992 to ensure the protection of methyl bromide workers and of persons near methyl bromide agricultural and structural fumigations. In January 2001, regulations went into effect that placed mandatory restrictions on field fumigations with methyl bromide. The regulations were designed to protect the public from potentially excessive, acute (short-term) exposures to methyl bromide. DPR's risk assessment addressed these exposures with well-defined and well-supported scientific analysis of the toxicology that was validated in a peer review by a special subcommittee of the National Academy of Sciences (NAS). The risk assessment and a link to the National Academy of Sciences' peer review may be found on DPR's Web site at the following address: <www.cdpr.ca.gov/docs/dprdocs/methbrom/mb_main.htm>. More problematic and complex are the methods used to determine the longer-term, seasonal exposure levels to workers in field and commodity chamber fumigations, and to persons living or working nearby.

Monitoring was conducted during the 2000 methyl bromide use season to measure ambient air concentrations and ascertain whether they posed a threat to public health. (See Appendix A for the monitoring summary, and Appendix B for risk evaluation.) Data showed that short-term levels were well within acceptable ranges. However, data also indicated that ambient concentrations in a few locations exceeded DPR's target exposure levels for seasonal (six- to eight-week) exposures, although the levels are well below those considered to pose an immediate health concern.

In a May 21, 2001, letter to interested parties, DPR presented a preliminary analysis of methyl bromide monitoring data, as well as several possible risk management options designed to reduce levels of methyl bromide in ambient air. DPR also sought and received comments from interested parties on the analysis and the options presented. Simultaneously, DPR scientists

continued their analysis of the data and the feasibility of employing the various risk management options. (See Appendix C for the revised analysis, including improved modeling results.)

DPR's analysis led to these key points:

* Several factors are at work that are both reducing how much methyl bromide is used and the way it is used, confounding an already complicated decisionmaking process.

* In the 2000 monitoring study, methyl bromide was detected in ambient air above the seasonal reference concentration at a few sites, but still was well below levels of health concern. As such, the detections did not warrant immediate regulatory action.

* Although methyl bromide is used throughout the State, there are a limited number of areas where it is used in relatively large amounts on a seasonal basis (that is, over a three-month period).

* To reduce ambient air levels, the focus must be on changing the variables of pounds used/in a given area/over a given interval. DPR will seek to achieve the seasonal reference concentration, but will need to work locally (focusing on one-square-mile sections within townships) on practical solutions.

* DPR and the CACs are implementing new methyl bromide regulations this year. The use practices mandated in the regulations are expected not only to reduce the amount of land that can be fumigated, but also reduce the amount of methyl bromide that can be used on any given day, thus reducing average exposures.

* As supplies of methyl bromide have been restricted by law and the price has increased, new alternatives have been registered and growers are increasingly turning to them (according to industry reports, confirmed anecdotally by the CACs).

DPR Response to Findings and Analysis:

* Additional air monitoring will be conducted both by the State and by registrants, focusing on areas of highest use.

* During the 2001 season, DPR, CACs, and the strawberry industry will initiate a focused effort to reduce methyl bromide use in historically high-use areas, and develop strategy to accelerate the introduction of methyl bromide alternatives.

SCOPE OF CONCERNS:

Methyl Bromide Use Patterns:

Although methyl bromide is used throughout the State, in only a few relatively small regions is methyl bromide use both extensive and extended enough that ambient air levels may exceed the interim reference concentration (greater than 20,000 pounds per month in a township on a seasonal basis of three consecutive months or more). (See Appendix C for details of computation.)

Pesticide use reporting data analyzed for 1999 disclosed 17 townships that met these criteria. These townships, in eight counties, were a small fraction of the 458 townships in 45 counties in which methyl bromide was reported used in 1999.

These 17 townships accounted for more than 50 percent of the methyl bromide used in the State in 1999 during the peak application season of July through September, and a third of the State's methyl bromide use for the year (5 million pounds of the total 15.4 million pounds used). There were six townships in the Monterey/Santa Cruz area, four in Ventura County, two in Santa Barbara County, two in Kern County, one in Sutter County, and one in Orange County where this high, extended-use occurred during the summer and into fall. In all but Sutter and Kern counties, methyl bromide use was on land to be planted with strawberries. In Kern County, use was on land to be planted in flower crops, and in Sutter County, on land to be planted with fruit trees. In addition, there was one township in Riverside County that met the high, extended-use criteria, with the highest methyl bromide use in November, December, and January, on land to be planted in peppers and melons.

DPR also conducted an analysis of use reporting data for 2000. (The 2000 use reporting data used for this analysis must be considered very preliminary and is subject to change after error-checking programs are run.) Total use of methyl bromide declined by a third in 2000, according to these preliminary estimates, to 10.4 million pounds. Thirteen townships in 2000 met the 20,000-pound, three-month criteria: one each in Kern, Merced, Orange, and Santa Barbara counties; six in the Monterey/Santa Cruz area; and three in Ventura. There were 415 townships in 41 counties in which methyl bromide was reported used in 2000. The 13 townships accounted for about half the State's methyl bromide use from July through September, and a third of the State's overall use of methyl bromide in 2000.

DPR has concluded, therefore, that statewide regulations are not appropriate at this time for dealing with these localized use patterns. A more productive approach would be to focus on high-use areas where the greatest impact can be made. DPR will pursue a targeted strategy that facilitates transition to alternative pest management systems in a controlled and predictable manner, in areas of highest extended use.

Toxicology Data Used to Support Reductions:

DPR relied on the best science available to calculate a series of reference concentrations for methyl bromide exposure, based on exposure periods that included one day, one week, two to five weeks, six to eight weeks (seasonal), and lifetime. The science on which these values were based was peer reviewed and supported by the National Academy of Sciences panel. The reference concentration for an eight-week period was determined to be .001 to 002 parts per million, that is, 1 to 2 parts per billion.

Impact of New Regulations:

In January 2001, new regulations governing methyl bromide field fumigations went into effect in California. The regulations set minimum buffer zones around fumigated fields, and expanded the size of most buffer zones, based on the amount of methyl bromide used, method of application, and proximity of the field to people. The size of some buffer zones was more than doubled. Special protective measures were imposed for applications near schools, and notification of persons living near fumigation sites is now required. Furthermore, to reduce exposure to methyl bromide workers, work hours were reduced significantly.

These and other changes mandated by the regulations are expected to affect dramatically how and where methyl bromide is applied. Growers will now have to fumigate smaller plots of land over several weeks. According to reports from industry and the CACs, fields are being split into application blocks three to five times smaller than last year, and the application season has as much as doubled in length. Some specific fumigations are taking three to 20 times longer than last year to complete. Combined with the limits on work hours and other restrictions, the amount of methyl bromide applied on any given day will be reduced. Some acreage, because of its proximity to occupied structures or other sensitive sites, can no longer be fumigated.

The reference concentrations set out in DPR's risk assessment are based on exposure *averaged* over a given period, be it one day, a week, several weeks, or months (with less exposure allowed as the period of continual exposure lengthens). With acreage that can be treated each day limited both by regulation and by logistical factors (e.g., worker hours), the application season has been lengthened, but less methyl bromide may be used on any given day. This can reduce ambient air levels averaged over time, and therefore, *average* exposures can be lower. The changes in use practices that result from the new regulations, therefore, may resolve many exposure concerns. DPR cannot logically justify or scientifically support imposing new restrictions based on ambient air levels that were the result of use practices that may no longer be employed (that is, use practices in effect before the new regulations).

In short, effective implementation of the new regulations will help reduce community exposure to methyl bromide. Furthermore, overlaying another series of restrictions on the regulations will

make it impossible to scientifically assess the impact of the regulations on methyl bromide use practices and resulting ambient air levels.

Air Monitoring:

In their analysis, DPR staff recommended additional monitoring in 2001 to gauge the impact of the regulations on use practices and validate the correlation between use of methyl bromide and resulting ambient air levels at varying distances from the application. Starting in July, DPR and ARB will conduct monitoring in the same areas the two agencies monitored in 2000. The goal is to evaluate real-world use this year since air monitoring data from 2000 may not be applicable under the new regulatory scheme now being carried out. A detailed description of the monitoring plan will be available online after July 1, 2001, at <www.cdpr.ca.gov>.

In addition, DPR is requiring the methyl bromide registrants to conduct additional monitoring in the next several months, focused on the high, extended-use townships. This will provide data to allow DPR to greatly expand its analysis. For example, DPR will be able to determine if air concentrations vary with geographic region and/or season.

The reevaluation notice and the summary of the reevaluation process are attached. Please note that should a registrant fail to submit data required by a reevaluation notice, California law allows DPR to suspend or cancel sales and use of the pesticide products.

Approaches to Limit Exposure:

Growers of the State's strawberry crop are the largest users of methyl bromide. More than 95 percent of California's strawberry acreage was treated with methyl bromide between 1997 and 1999, according to a UC analysis of pesticide use data. That same study (published in the May-June issue of UC's *California Agriculture* magazine) points to a significant amount of research conducted to identify effective chemical and nonchemical alternatives to methyl bromide for strawberry growers. UC research has found that not fumigating results in yield reductions of 40 to 60 percent. Therefore, it is reasonable to conclude that most growers will choose to fumigate either with methyl bromide–even at an increased cost–or with an alternative chemical or nonchemical method.

Modifying the use of methyl bromide to fumigate strawberry fields before planting is the most critical element of this plan. California is the nation's leading strawberry grower, accounting for about 85 percent of the nation's production, on approximately 25,000 acres. Strawberry fields are typically treated annually (or in a few cases every other year) with methyl bromide. Strawberries are a high-value crop that can be raised economically on relatively small-sized plots. Most of the State's commercial strawberry acreage is concentrated in coastal counties,

primarily Monterey, Ventura, Santa Cruz, and Santa Barbara, with urban or suburban development nearby.

As part of its analysis of mitigation options, DPR evaluated limiting use by township and concluded that there are serious and potentially insurmountable logistical barriers to carrying out a system of caps for methyl bromide. Limiting use through edict (that is, through caps) could be accomplished but with great difficulty and limited prospects of success. Moreover, the resources and effort involved in doing so would compromise the successful implementation of the new regulations being carried out this year for the first time. DPR is especially concerned that caps on methyl bromide use could result in supply inequities that in the strawberry industry could unfairly punish small, family farms, many of them minority-owned.

Caps may also force some growers to use alternative fumigants that could have unanticipated environmental or health consequences (as it is unlikely that they would choose not to fumigate, considering the yield reductions).

The methyl bromide air levels of concern are limited in scope, and are not of statewide concern. Therefore, we will focus our efforts in specific communities. Even a worst-case analysis of the air monitoring results from 2000 does not indicate an immediate health concern and, therefore, do not warrant measures that could jeopardize the successful implementation of the current methyl bromide regulations. A managed phasedown is a more prudent and responsible approach, allowing DPR, CACs, and industry to work at the local level to carry out a staged alternatives implementation plan that is practical and can be quickly put into action, and at the same time avoids sudden supply scarcities that can lead to predatory activities that adversely impact smaller farming operations. Under consideration are pilot programs evaluating the rate of methyl bromide applied per acre to reduce it to the lowest possible efficacious rate, and focusing the use of newly available alternatives in the high, extended use areas.

Availability and Use of Alternatives:

As the supply of methyl bromide becomes more limited and costly, farmers have become increasingly interested in using alternatives. Many have expressed interest in using two, recently registered 1,3-D fumigant products that can be applied to strawberry acreage through drip irrigation.

Conclusion:

DPR has already dealt with the most critical exposure issues regarding methyl bromide by adopting regulations designed to reduce acute exposures. Effective implementation of these regulations is critical. Related to this, we must expand our monitoring efforts and initiate practical steps to reduce seasonal exposures.

The steps taken by DPR will begin our progress toward a better characterization of community exposures, while initiating efforts to reduce methyl bromide use and exposure. Ensuring full implementation of the new regulations will advance our goal to achieve acceptable community air levels further and may well resolve most (if not all) of DPR's concerns.

The measures now in effect in California are very health-protective, far beyond what the U.S. Environmental Protection Agency or any other state has in place. The achievement of the reference concentration, and accompanying protection of the health of workers and others, is our goal. Collection of additional data is necessary to ensure we have solid information on which to build a workable command-and-control regulatory mechanism, should we determine that problematic exposures are occurring and it is needed. Parallel with data collection will be aggressive implementation of an alternatives implementation strategy in high, extended-use areas to reduce reliance on methyl bromide.

Attachments:

- Appendix A, Monitoring Summary
- Apprendix B, Risk Evaluation
- Appendix C, Revised Analysis of Monitoring Data
- Reevaluation Notice
- Summary of Reevaluation Process