

INITIAL STATEMENT OF REASONS AND PUBLIC REPORT  
DEPARTMENT OF PESTICIDE REGULATION

Title 3. California Code of Regulations  
Adopt Sections 6448.3 and 6448.4  
Amend Sections 6448, 6449.1, 6452, 6452.2, 6624, 6626, and 6881  
Adopt New Section 6448.1 and Renumber and Amend Previous Section 6448.1 to 6448.2  
Pertaining to Health Risk Mitigation and Volatile Organic Compound Emission Reduction  
for 1,3-Dichloropropene

This is the Initial Statement of Reasons required by Government Code section 11346.2, and the public report specified in section 6110 of Title 3, California Code of Regulations (3 CCR). Section 6110 meets the requirements of Title 14, CCR section 15252, and Public Resources Code section 21080.5 pertaining to certified state regulatory programs under the California Environmental Quality Act.

SUMMARY OF PROPOSED ACTION/PESTICIDE REGULATORY PROGRAM ACTIVITIES  
AFFECTED

The Department of Pesticide Regulation (DPR) proposes to adopt 3 CCR sections 6448.3 and 6448.4; amend sections 6448, 6449.1, 6452, 6452.2, 6624, 6626, and 6881; and adopt new section 6448.1, and renumber and amend previous section 6448.1 as section 6448.2. The pesticide regulatory program activities affected by the proposal are those pertaining to restricted materials and pesticide use enforcement. In summary, the proposed action restricts the use of 1,3-dichloropropene (1,3-D) to mitigate the potential 72-hour acute risk and 70-year lifetime cancer risk to non-occupational bystanders. The proposed mitigation measures will also further reduce the emissions of 1,3-D as a volatile organic compound (VOC). The proposed action:

- allows the use of 1,3-D only for the production of agricultural commodities, effectively prohibiting other uses that are not currently registered;
- establishes mandatory setbacks (distances from occupied structures where 1,3-D cannot be applied);
- sets limits on the application rate and acres treated for individual field soil fumigations;
- places restrictions on multiple field soil fumigations that do not meet distance or time separation criteria;
- limits the allowed methods to apply 1,3-D, including establishing criteria for acceptable types of tarpaulins that can be used;
- requires an annual report from DPR that includes evaluations of 1,3-D use and air monitoring results; and
- requires the inclusion of certain information in existing pesticide use records and pesticide use reports.

DPR proposes to incorporate by reference: “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024” in proposed sections 6448, 6448.2, 6624, and 6626. A copy of this document is included in the rulemaking file.

## SPECIFIC PURPOSE AND FACTUAL BASIS

### **Background on 1,3-Dichloropropene**

1,3-D was introduced in California in 1970 as a fumigant used to control nematodes, insects, and disease organisms in the soil. 1,3-D has major uses in California in fruit and nut trees, strawberries, grapes, carrots, and several other food and non-food crops. It is commonly used as a pre-plant treatment that is injected into the soil. It may also be applied through drip irrigation. Regardless of the application method, the possibility of offsite transport of this fumigant due to volatilization may subsequently result in human exposure through inhalation.

1,3-D is currently listed as a restricted material in 3 CCR section 6400(e). As a restricted material, the purchase and use of 1,3-D for agricultural production purposes are allowed only under a restricted materials permit from the local county agricultural commissioner (CAC). Before issuing a permit, the CAC must evaluate the permit application to determine whether the intended use may cause a substantial adverse environmental impact based on local conditions at the application site. Depending on the results of this review, the CAC may deny the permit or impose permit conditions including the use of specific mitigation measures. As part of the permit for any restricted material, applicators must provide a notice of intent to the CAC before any application. The notice of intent includes application-specific information, such as the number of acres being treated and date the application is intended to commence.

1,3-D is also listed as a toxic air contaminant (TAC) in 3 CCR section 6860(b) based on its designation as a hazardous air pollutant under the federal Clean Air Act. DPR has been managing the use of 1,3-D as a TAC in order to protect human health since 1990. In 2013, Food and Agricultural Code (FAC) sections 14023 and 14024 were amended to apply to pesticides that, like 1,3-D, are both TACs and hazardous air pollutants (HAP-TACs). Consequently, pursuant to FAC section 14023(f), for HAP-TACs for which a risk assessment has been completed, DPR must determine the “need for and appropriate degree of control measures.” Control or mitigation measures that DPR develops for HAP-TACs must also follow the requirements specified by FAC section 14024, including consulting with specified agencies.

1,3-D is a VOC and its emissions to the air contribute to the formation of ozone, a major air pollutant in California. Currently, 3 CCR sections 6448 and 6448.1 address the VOC requirements for 1,3-D field soil fumigations. The VOC requirements are mandated by the pesticide element of the ozone state implementation plan (SIP) for the federal Clean Air Act. The pesticide SIP element pertains to five regions in California that exceed the federal ozone standard (nonattainment areas) during the May–October peak ozone season.

### **Current Management of 1,3-D**

In August 2015, DPR released a draft 1,3-D risk assessment, known as the risk characterization document. DPR received comments on the draft risk characterization document from Dow AgroSciences (DAS), U.S. Environmental Protection Agency (U.S. EPA), the Office of Environmental Health Hazard Assessment (OEHHA), and several scientists coordinated through the University of California for peer review. DPR scientists considered and responded to the

comments (DPR, 2016a-f) and on December 31, 2015, DPR published a final risk characterization document titled, “1,3-Dichloropropene Risk Characterization Document, Inhalation Exposure to Workers, Occupational and Residential Bystanders and the General Public.” (DPR, 2015b).

The Risk Characterization Document evaluates the toxicity and oncogenic effects from inhaling 1,3-D, including but not limited to oncogenic effects, and assesses the levels at which such effects occur, how much 1,3-D human exposure occurs under different scenarios, uncertainties in available data, and the levels at which harmful effects are not expected to occur. The scientific analysis in the Risk Characterization Document reflects the fact that an individual’s exposure risk from 1,3-D varies depending on whether the individual lives near a field treated with 1,3-D (i.e., residential/non-occupational bystander), works near a field treated with 1,3-D (i.e., occupational bystander), or works with, directly handles, or otherwise works in and about a field treated with 1,3-D (i.e., a worker).

The Risk Characterization Document first classifies exposure risks for workers, occupational bystanders, and residential/non-occupational bystanders based on assumptions about the different durations of exposure to 1,3-D experienced by each group. Occupational lifetime exposure estimates in the Risk Characterization Document for both workers and occupational bystanders are based on the assumption that workers and occupational bystanders will potentially be exposed to 1,3-D over the course of an 8-hour workday, and—in the long-term—over a 40-year period spent working, out of an average lifespan of 75 years. In contrast, the Risk Characterization Document defines residential/non-occupational bystanders as nearby residents—including children—with 24-hour/7-day a-week exposure to 1,3-D in the ambient air over the course of 30, 50, and 70 years living in a high 1,3-D use area.

In addition to duration of exposure, the Risk Characterization Document further classifies risks based on how potential exposures occur. While worker exposures occur on the 1,3-D application site as the direct result of application and handling activities, residential and occupational bystander exposures occur as a result of off-site movement of 1,3-D from a treated field into ambient air. With respect to worker exposure, the Risk Characterization Document’s exposure assessment further distinguishes between different types of workers and the type of work performed. Generally, a worker handling the pesticide or moving in and about the treated field may be exposed directly to high concentrations of 1,3-D that emerge from the soil where the product is applied. Thus, worker exposure scenarios in the Risk Characterization Document include an analysis of short-term, seasonal, annual, and lifetime exposures for different types of field workers. These include the pesticide applicator, the handlers who remove tarps from fumigated fields, the workers who load fumigants for the application, and the reentry worker who enters the treated field following a restricted entry interval.

Unlike workers working in and about the treated area, residential/non-occupational bystanders will not be exposed directly to 1,3-D emerging from the soil where the product is applied. Rather, residential/non-occupational bystanders may be exposed to 1,3-D over the course of their lifetime when the pesticide enters ambient air and moves away from the application site as the result of drift or wind events. Accordingly, the Risk Characterization Document assesses the potential concentration of 1,3-D in the ambient air resulting from off-site movement using air dispersion models and monitoring data.

On October 6, 2016, after consulting with the California Air Resources Board (CARB), the California Department of Food and Agriculture (CDFA), OEHHA, and air pollution control or air quality management districts in affected counties (Marks, 2016a), and in response to information in the Risk Characterization Document regarding the ways in which 1,3-D exposure was understood to cause cancer, DPR issued a *Risk Management Directive and Mitigation Guidance for Cancer Risk from 1,3-D* (Marks, 2016b), which directed staff “to initiate and guide the development and adoption of mitigation measures to address cancer risks to bystanders” so that there is at least a 95 percent probability that the average air concentrations for 70 years will not exceed [a regulatory target concentration of] 0.56 ppb.” Although the Risk Management Directive only referred to “bystanders,” the regulatory target concentration was clearly based on analytic assumptions that apply only to non-occupational bystanders (as opposed to occupational bystanders), including children, specifically, 24-hour/7-day-a-week exposures in ambient air over a 70-year residency. These assumptions were consistent with the Risk Characterization Document’s analysis of exposures to residential/non-occupational bystanders. Further, the Risk Management Directive explained and clarified that, “[r]isk management decisions to address cancer risk to handlers of 1,3-D (workers involved in the application), as well as acute, seasonal, and chronic (non-cancer) exposures identified in the [Risk Characterization Document] will be issued at a later date after further analysis and consideration.” DPR is currently separately considering regulations to address risks to workers that DPR has identified from exposure to 1,3-D and would develop any such requirements jointly and mutually with OEHHA as set forth in FAC sections 12980 and 12981 and the August 2008 Memorandum of Understanding between DPR and OEHHA.

To mitigate the 1,3-D cancer risk to non-occupational bystanders, DPR currently implements a “township cap” program which includes a yearly use limit within designated 6x6 mile areas. The township cap is enforced through a memorandum of understanding between DPR and the 1,3-D registrant, and recommended permit conditions adopted by the CACs. The township cap program includes six elements that address non-occupational bystander exposure. First, a notice of intent must be submitted to the CAC at least 48 hours before the fumigation begins. Second, the CAC will deny the notice of intent if the proposed application exceeds the township cap. Third, use reports for 1,3-D must include the field fumigation method code. Fourth, 1,3-D field soil fumigations are prohibited within 100 feet of any occupied structure, measured from the perimeter of the application block to any occupied residences, onsite employee housing, schools, convalescent homes, hospitals, or other similar sites identified by the CAC. If a structure is within 100 feet of the application block, no person shall be present at this structure at any time during the application and during the seven-consecutive day period after the application is complete. Product labels have a similar but less stringent occupied structure requirement. Fifth, field soil fumigations in December are prohibited. And finally, the maximum application rate is 332 pounds active ingredient per acre.

Product labels currently require a minimum soil moisture of 25 percent of soil field capacity, in part to reduce 1,3-D emissions. Labels also recommend soil preparation and sealing practices, such as “The soil should be free of clods” that also reduce emissions.

## **Lawsuit Challenging Current Management of 1,3-D**

In January 2017, Juana Vasquez, Californians for Pesticide Reform, and Pesticide Action Network North America filed a lawsuit against DPR (*Vasquez v. California Department of Pesticide Regulation*) challenging DPR's township cap program for 1,3-D.

On May 14, 2018, the Superior Court entered a judgment and issued a writ of mandate ordering DPR to submit to the Office of Administrative Law (OAL) proposed regulations “to address potential cancer risks to bystanders from use for 1,3-D consistent with the APA and FAC sections 12980 and 12981” within one year. The judgment also ordered DPR to “[t]emporarily maintain, as interim measures to address potential cancer risks to bystanders from the use of 1,3-D, the annual township cap of a maximum of 136,000 adjusted pounds and the prohibition on December applications until formal rulemaking is complete.”

On July 30, 2018, DAS (Intervener/Defendant) filed a Notice of Appeal of the Superior Court's judgment. On September 8, 2021, the First District Court of Appeals affirmed the lower court decision that DPR's township cap program was an underground regulation. The appellate court declined to decide whether FAC sections 12980 and 12981 applied to the existing township cap program because the applicability of those sections would depend on the contours of any final adopted regulation.

## **Updates to the Management of 1,3-D**

During the appeal process, DPR continued its air monitoring for 1,3-D and conducted additional data analyses. The monitoring and data analyses indicated that additional mitigation measures were needed to address short-term acute exposures to non-occupational bystanders, including infants and children. To assist in developing the mitigation measures for acute exposure to non-occupational bystanders, DPR conducted a pilot project in 2020–2021 to evaluate potential new fumigation methods that would achieve emissions reductions comparable to totally impermeable film (TIF) tarping (Kandelous, 2022).

On October 19, 2021, after consulting with CARB, CDFA, OEHHA, and air pollution control or air quality management districts in affected counties (DPR, 2021), DPR issued a *Risk Management Directive and Mitigation Guidance for Acute, Non-Occupational Bystander Exposure from 1,3-Dichloropropene* (Henderson, 2021), which directed DPR staff “to develop proposed regulatory language to establish control measures that mitigate the effects of acute risks to non-occupational bystanders associated with 1,3-D by limiting the 72-hour acute exposure to non-occupational bystanders to 55 ppb or less.” The acute Risk Management Directive also instructed staff to “evaluate the impact acute control measures may have on DPR's existing mitigation to address cancer risk to non-occupational bystanders from 1,3-D.”

## **Summary of the Scientific Basis for the Mitigation Measures**

In general and relevant to this proposed regulation, DPR has three means to mitigate exposures to non-occupational bystanders from pesticides: increase the distance between non-occupational bystanders and applications (setbacks), change methods of fumigation to reduce emissions, and

place limits on use (e.g., application rate limits, acreage limits, regional use limits [township cap]). DPR proposes to use a combination of all three means to mitigate 1,3-D exposure to non-occupational bystanders. For fumigants such as 1,3-D, non-occupational bystander exposure occurs through inhalation as a result of off-site movement of 1,3-D from a treated field into the ambient air. Inhalation exposure is a function of the fumigant emissions from the treated soil to air, the distance between the emissions and non-occupational bystanders, and the weather conditions when the emissions occur. Mitigation measures primarily consist of requirements to reduce or limit emissions during and after the application and increase the distance between field soil fumigations and non-occupational bystanders, such as infants and children, to reduce exposure.

Emission estimates are key scientific data needed to develop mitigation measures. For these regulations, DPR proposes to use the HYDRUS computer model to estimate emissions of fumigant from soil to the atmosphere. HYDRUS is a first principles (physics-based) computer model that uses a finite element method approach to describe movement of heat, water, and solute throughout the soil profile. DPR worked with the developer of HYDRUS to implement a fumigant module that allows for simulations that include tarpaulin cutting and bedded applications with untarped furrows. This model can estimate 1,3-D emissions based on its chemical properties (e.g., soil adsorption), characteristics of the soils where field soil fumigations occur (e.g., water content), and characteristics of methods of application (e.g., depth of fumigant injection below the soil surface). Validation work and external peer review has subsequently shown that the HYDRUS model produces flux estimates comparable to those reported across a range of field studies and has additionally indicated that HYDRUS can accurately simulate the fundamental processes of heat, water, and solute transport throughout the soil profile, increasing confidence in the ability of the model to simulate flux under new scenarios (Kandelous, 2019). HYDRUS estimates the 1,3-D emissions as a rate (e.g., pounds volatilized per hour [per acre]) and shows how the emission rate changes over time. HYDRUS also estimates the cumulative emissions for a specified period of time. Brown (2019) and Brown (2022) describe DPR's HYDRUS methods and estimated 72-hour emissions (for setback purposes) and 500-hour (21-day) total emissions (for township cap and VOC purposes) for each 1,3-D fumigation method proposed for the regulation. Brown (2019) describes the methodology and was peer reviewed (DPR, 2019). Brown (2022) uses the same methodology but includes additional data collected since the previous analysis.

Briefly, Brown (2022) used HYDRUS to estimate emissions for 22 unique 1,3-D fumigation methods proposed to be included in the regulations. For each of the proposed fumigation methods, emissions were modeled using the chemical properties of 1,3-D and soil characteristics from 21 fields sampled just prior to fumigation. The 21 fields included eight soil texture classes from three coastal counties and six inland counties, which represent the range of soil conditions for 1,3-D fumigations in California. The peak 72-hour emissions accounted for between 3 and 44 percent of the amount applied depending on the fumigation method.

Based on the peer-reviewed (DPR, 2019) evaluation described in Luo (2019a), DPR proposes to use a second computer model, American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), to complement HYDRUS in estimating 1,3-D air concentrations for these regulations. AERMOD is a U.S. EPA-approved and validated air dispersion model. It has been used to estimate air concentrations from industrial sources as well as for other fumigants. AERMOD estimates air concentrations based on two key data inputs: emission rate and weather

conditions. DPR proposes to use the 1,3-D emissions estimated from HYDRUS, and historical weather data from several California locations as the AERMOD inputs.

### Establishing Setbacks and Related Requirements

The proposed regulations include the use of setbacks from structures occupied by non-occupational bystanders (distances from structures where 1,3-D cannot be applied for a specified time). DPR used HYDRUS and AERMOD modeling to determine the various combinations of fumigation method, season, application rate, and acreage so that the target acute 1,3-D air concentration of 55 ppb is not exceeded at the setback distance. To account for variability in weather conditions, DPR's AERMOD modeling includes five years of one-hour meteorological data to simulate one-hour air concentrations. Model simulations of the large data sets are managed by AERFUM, an integrated air dispersion modeling system for soil fumigants developed by DPR (Luo, 2019b). DPR proposes a series of tables that contain the allowed combinations of setback distance, maximum application rate, and maximum acreage. Each table would be specific for a group of fumigation methods and season (November–February winter season and March–October non-winter season). Luo (2022a) describes the AERMOD modeling used to determine the proposed setback tables for nine groups of fumigation methods.

### Totally Impermeable Film (TIF) Tarpaulin Requirements

Certain 1,3-D application methods use a tarpaulin for agronomic purposes and/or to reduce emissions. Standard polyethylene tarpaulins have little or no effect on 1,3-D emissions, but a certain type of tarpaulin, designated as TIF, significantly reduces 1,3-D emissions. To ensure that field soil fumigations that use TIF tarpaulins have the low emissions assumed in the computer modeling, DPR proposes to establish by regulation a 1,3-D permeability threshold of 0.046 centimeters per hour for TIF tarpaulins using a standard American Society for Testing and Materials (ASTM) laboratory method. This threshold is based on DPR's analysis of laboratory permeability measurements (Tuli and Delgado, 2022).

TIF tarpaulins significantly reduce 1,3-D emissions by trapping them under the tarpaulin after application. However, due to the potential for higher emissions when TIF tarpaulins are cut and removed, DPR's current recommended permit conditions specify TIF tarpaulin cutting no sooner than nine days following fumigation, and product labels require five days. DPR proposes a minimum 10-day period following fumigation before TIF tarpaulins can be cut to allow sufficient time for 1,3-D to be degraded or absorbed to soil before tarpaulin removal. The 10-day period is based on HYDRUS modeling that showed increasing the tarp duration time from nine to ten days reduced the 72-hour peak in 1,3-D emissions following tarpaulin cutting by 26-30 percent depending on the fumigation method. This decrease in 1,3-D emissions is sufficient to reduce the 72-hour air concentrations to less than 55 ppb at the setback distance (Brown, 2022).

### Allowed Fumigation Methods

The regulations propose to prohibit any fumigation methods not specifically allowed. 1,3-D emissions vary with fumigation method. To determine the appropriate setback distance and other requirements, the emissions for each fumigation method allowed must be determined. For each of

the proposed allowed fumigation methods, DPR has determined the 72-hour emissions for setback purposes (Brown, 2022).

### Sufficiency of Acute Measures to Mitigate Cancer Risk

While the setback distance and related requirements are designed to mitigate the acute risk to non-occupational bystanders, they will also reduce long-term exposures and address cancer risks to non-occupational bystanders from 1,3-D use. This determination is based on an analysis of 1,3-D use data from 2013-2017. Use of 1,3-D was historically high during 2013-2016 due to DPR granting waivers from the township cap use limit. Even assuming use consistent with the highest worst-case scenario use from that time period, DPR estimates that implementation of the proposed 1,3-D regulations would result in an estimated highest one-year average air concentration of 0.35 ppb (Segawa and Luo, 2022). This is well below DPR's regulatory target concentration for cancer risks to non-occupational bystanders of 0.56 ppb as a 70-year average. This concentration represents only one of 1,685 statewide township-year combinations with 1,3-D use for 2013-2017—most of which involved considerably lower use and one-year average air concentrations. The 1,3-D use in a township with the highest historical use would need to (1) increase by more than 36 percent each year for several years to reach the estimated revised township cap and (2) have more than a five percent chance of exceeding the 0.56 ppb regulatory target concentration (Segawa and Luo, 2022). DPR does not expect use to increase so far even beyond the highest worst-case historic use. Moreover, Segawa and Luo (2022) estimate that the five-year average 1,3-D air concentrations are significantly less than the one-year averages.

### **Proposed Regulations**

The purposes of these proposed regulations are to mitigate the potential 72-hour acute risk and 70-year lifetime cancer risk to non-occupational bystanders from the use of 1,3-D. Exposure reduction to mitigate health risks will be accomplished by establishing minimum distances between 1,3-D field soil fumigations and occupied structures, referred to as setbacks, that would be in effect for a specified period of time. Specifying setback distances also requires restrictions on fumigation methods, limits on the application rate, and limits on the amount of acreage that can be fumigated in a single application. As discussed above, the acute mitigation measures proposed in the regulations by themselves meet DPR's regulatory target concentration for cancer risk of 0.56 ppb as a 70-year average and sufficiently mitigate 1,3-D cancer risks to non-occupational bystanders. As a result, a township cap is not included in the proposed regulations. However, in order to provide ongoing monitoring and verification that the setback distances and related requirements address cancer risk to non-occupational bystanders, the proposed regulations will require DPR to track and report 1,3-D use and air monitoring data on an annual basis. The annual report will include an evaluation of the townships with the highest use and monitoring locations with concentrations that are more than specified thresholds. This evaluation will help determine if additional mitigation measures are needed.

A secondary purpose of these regulations is to reduce VOC emissions from 1,3-D field soil fumigations. Emission reduction will primarily be accomplished by the proposed fumigation method changes, such as requiring a higher soil moisture level.



### Amend 3 CCR Section 6448. General Requirements.

Existing section 6448 specifies when and where VOC requirements for 1,3-D (existing section 6448.1) apply. These VOC requirements are mandated by the pesticide element of the ozone State Implementation Plan (SIP) for the federal Clean Air Act. The pesticide SIP element pertains to five regions in California that exceed the federal ozone standard (nonattainment areas) during the May–October peak ozone season. DPR proposes to amend this section so that these requirements apply statewide and year-round to mitigate acute and cancer risks to non-occupational bystanders from 1,3-D. Additionally, this section will be amended with general requirements that apply to all field soil fumigations of 1,3-D.

DPR proposes subsection 6448(a) to limit use of 1,3-D to the production of an agricultural commodity. Although 1,3-D has little or no non-production agriculture or non-agricultural use, DPR proposes to explicitly prohibit these uses because they would likely use fumigation methods for which DPR has not determined setback requirements. DPR cannot determine appropriate setback requirements for non-production agriculture and non-agricultural uses with the available data and, without setback requirements, these fumigations could result in acute exposures exceeding the regulatory target concentration of 55 ppb.

Proposed subsection 6448(b) specifies that 1,3-D field soil fumigations are prohibited within a minimum distance (setback) of any occupied structure. DPR proposes to specify an occupied structure as a “structure that is, will be, or may be occupied at any time during the application and/or setback period, measured from the perimeter of the application block to any residence, onsite employee housing, schools, convalescent homes, hospitals, businesses or other similar sites identified by the commissioner.” These requirements are necessary to maintain consistency with current recommended permit conditions and is compatible with the definition on 1,3-D labels. DPR also proposes to require a setback from other indoor and outdoor sites that are occupied for at least 72 consecutive hours during and following a 1,3-D application. This exposure period is based on DPR’s regulatory target concentration of 55 ppb as a 72-hour average. A setback distance is necessary to ensure that non-occupational bystanders are not exposed to 1,3-D air concentrations exceeding the acute exposure regulatory target of 55 ppb as a 72-hour average. The proposed setback distances from an occupied structure range from 100 to 500 feet based on fumigation method, season, application rate, and application block size, and are specified in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” a document incorporated by reference. The proposed provisions within this document are discussed later.

DPR proposes to prohibit 1,3-D fumigations if the application block is within the setback distance of a structure unless no person is present at the structure at any time during the 1,3-D fumigation and for at least seven consecutive days after the fumigation is complete. This requirement, including the seven consecutive day period, is consistent with current 1,3-D product label requirements. Pesticides, including their product labeling, must be approved and registered by U.S. EPA before they are registered in California. All labels must bear a misuse statement (40 Code of Federal Regulations section 156.10(i)(2)(ii)), which explains that the label is the law. In addition, FAC section 12973 states in part that the use of any pesticide shall not conflict with the registered labeling. Therefore, the seven consecutive day period is necessary to maintain consistency with 1,3-D product labeling.

Proposed subsection 6448(b)(1) prohibits an application of 1,3-D within the setback distance of any structure outside the property to be treated, unless that structure outside the property to be treated will be voluntarily vacated during the application and for seven days after the application is complete. This prohibition is necessary because neither the operator of the property to be treated nor the certified applicator can control occupancy of structures outside the property to be treated. Proposed subsection (b)(1) also includes recordkeeping and reporting requirements for the certified applicator to obtain written agreement from the operators of the other properties that the structures outside the property to be treated will be voluntarily vacated to ensure this agreement is documented. Additionally, it is necessary for the certified applicator to provide the documentation to the commissioner with each notice of intent so that the commissioner can verify compliance.

Proposed subsection (c) establishes more stringent setback distance requirements for multiple 1,3-D field soil fumigations that “overlap” in distance and time. Overlapping field soil fumigations can have higher air concentrations than individual field soil fumigations, so it is necessary to establish more stringent setback distances to ensure the 55 ppb regulatory target concentration for acute exposure to non-occupational bystanders is not exceeded. A minimum separation distance of the combined setback distance is proposed in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” a document incorporated by reference. To determine if field soil fumigations overlap, the setback distance is measured from the application block to other 1,3-D application blocks rather than to the occupied structures. DPR proposes a minimum time separation of 36 hours from the time the first application ends until the second application begins. For example, if Application 1 has a setback distance of 100 feet and Application 2 has a setback distance of 200 feet, they would overlap if the separation between the field soil fumigations is 300 feet or less, *and* if Application 2 begins before 36 hours elapses from the end of Application 1.

For overlapping field soil fumigations, subsection (c) requires the same setback distance from occupied structures for all application blocks. This setback distance is determined using 1) the combined acreage of all overlapping application blocks, 2) the highest application rate, and 3) the setback table for the fumigation method with the largest setback distance specified in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” a document incorporated by reference.

DPR proposes to exempt fumigation methods that require the minimum setback restrictions specified in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” a document incorporated by reference, from the overlapping field soil fumigations requirements. For example, TIF tarpaulin methods with minimum restrictions are exempt from overlapping applications requirements. Luo (2022a) indicates that field soil fumigations using these fumigation methods do not exceed the 55 ppb regulatory target concentration for acute exposure to non-occupational bystanders even if the largest allowed field soil fumigations are adjacent and conducted on consecutive days.

These proposed requirements for overlapping field soil fumigations are based on the analysis described in Luo (2022a). The analysis evaluates the time separation in 24-hour intervals, measured from the *start* of one application to the *start* of the next application. This is necessary to account for all emissions and air concentrations beginning with the start of the first application. However,

regulatory time periods for pesticide applications are measured at the *end* of the application (e.g., restricted entry intervals, pre-harvest intervals). To maintain this regulatory consistency, the proposed time periods for multiple 1,3-D field soil fumigations are measured from the *end* of the first application to the *start* of the next application. Therefore, the proposed regulation assumes that 1,3-D field soil fumigations take 12 hours to complete (i.e., the end of the application is 12 hours after the start of the application). The proposed time separation has a 12-hour difference from the one described in Luo (2022a).

DPR proposes a separation distance that is the combined setback distance and 36-hour separation time for overlapping 1,3-D field soil fumigations for three reasons. First, it is consistent with the requirements for other fumigants, particularly chloropicrin. Several fumigant products contain a combination of 1,3-D and chloropicrin, so the same overlapping fumigation requirements will apply making compliance and enforcement easier. Second, a time separation greater than 36 hours will make the required soil moisture (50 percent of field capacity) difficult to maintain for large fumigations. Applicators will break up large fields into smaller application blocks and fumigate sequentially over several days to comply with the proposed setback distances. Maintaining the required soil moisture increases in difficulty as the time separation between application blocks increases. Third, the probability is low that overlapping 1,3-D soil field fumigations will exceed the 55 ppb regulatory target concentration at the proposed setback distance, as described below.

As described in Luo (2022a), the distance and time separation will achieve the 55 ppb regulatory target concentration at the setback distance for 93 to more than 95 percent of the overlapping field soil fumigations depending on fumigation method and season. This analysis is based on worst-case assumptions, including that both overlapping application blocks are the proposed maximum size of 80 acres. Evaluation of historical 1,3-D use data indicates that field soil fumigations of 160 acres or more are rare. For the setback analysis including overlapping application blocks, Luo (2022a) evaluated 1,3-D use data for 2013–2017. The number and size of the 1,3-D field soil fumigations during 2013–2016 are likely the largest of recent years because DPR granted waivers to the township cap during that time. Of the 12,351 field soil fumigations of 1,3-D that occurred during 2013–2016, 46 or 0.4 percent were 160 acres or larger and would need to be fumigated as two or more 80-acre application blocks under the proposed requirements. It is also possible that two adjoining 80-acre fields may fumigate simultaneously, but this would occur less frequently than a single field. Therefore, less than one percent of the 1,3-D field soil fumigations would have overlapping 80-acre application blocks and the overlapping fumigations would have 93 percent to more than 95 percent probability of achieving the 55 ppb regulatory target concentration at the setback distance.

Proposed subsections 6448(d) and (e) specify that 1,3-D field soil fumigations must not exceed application rates and application block sizes (acres) specified in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” a document incorporated into the regulation text by reference. These proposed provisions within this document are discussed later.

Proposed subsection 6448(f) requires notices of intent for 1,3-D to be submitted to the CAC at least 48 hours prior to the application. Current regulations require 24-hour submittal for most other restricted materials. CACs need additional time to make the more extensive evaluations of proposed 1,3-D applications under these proposed regulations. This includes determining

compliance with the applicable requirements in sections 6448–6448.2 such as setback distances, allowed fumigation method, and appropriate soil moisture option.

DPR also proposes to amend the authority and reference note to include a relevant citation, FAC section 14024.

#### Adopt New 3 CCR Section 6448.1. Approved Totally Impermeable Film (TIF) Tarpaulins.

Existing section 6448.1 pertains to 1,3-D field fumigation methods. DPR proposes to renumber and move those requirements to proposed section 6448.2.

DPR proposes to adopt new section 6448.1 and add the title, “Approved Totally Impermeable Film (TIF) Tarpaulins for 1,3-Dichloropropene.” This title is being added because the proposed revisions to this section will now pertain to TIF tarpaulins.

Proposed section 6448.1 pertains to TIF tarpaulins. Certain 1,3-D fumigation methods use a tarpaulin for agronomic purposes and/or to reduce emissions. While standard polyethylene tarpaulins have little or no effect on 1,3-D emissions, air monitoring and HYDRUS modeling indicate that TIF tarpaulins significantly reduce 1,3-D emissions. Standard polyethylene and TIF tarpaulins are visually and tactilely similar. Therefore, proposed subsection 6448.1(a) specifies that the Director will evaluate candidate TIF tarpaulins and maintain a “List of Approved Totally Impermeable Film (TIF) Tarpaulins” authorized for field soil fumigations of 1,3-D. This list will be made available on DPR’s Web site, providing easy access to this list that will ensure the appropriate tarpaulin is used. DPR proposes to approve TIF tarpaulins that have the low emissions assumed in the computer modeling and can be identified by state and local inspectors using the proposed criteria described below.

Two sets of criteria for TIF tarpaulins are proposed in subsections (a)(1) and (a)(2). Subsection (a)(1) establishes a 1,3-D mass transfer coefficient, or permeability threshold, of 0.046 centimeters per hour for TIF tarpaulins using a standard American Society for Testing and Materials (ASTM) laboratory method. This method was developed by U.S. EPA specifically to measure tarpaulin permeability to fumigants, and it is used to establish their list of approved tarpaulins for fumigants other than 1,3-D. Although U.S. EPA specifies low humidity for the test, DPR proposes more stringent high humidity test conditions because tarpaulin permeability is higher under high humidity and high humidity is more representative of field conditions in California. The proposed permeability threshold is based on DPR’s analysis of laboratory permeability measurements (Tuli and Delgado, 2022). Subsection (a)(2) specifies tarpaulin identification requirements so that inspectors out in the field can verify that the TIF tarpaulin used for a 1,3-D fumigation is one approved by DPR. DPR proposes to require the name and lot number in case a lot is defective, such as when quality control testing indicates that a lot does not meet the permeability requirement. The manufacturer can be notified to take corrective actions and CACs can check for other field soil fumigations with the defective tarpaulin. The proposed tarpaulin printing requirements will enable inspectors to reduce their 1,3-D exposure by identifying the tarpaulin without entering the fumigated area.

Subsection (b) proposes a public notice when DPR modifies the “List of Approved TIF Tarpaulins” or a notice to the applicant if DPR denies a request to add or amend a TIF tarpaulin to the list, to ensure that any changes are transparent.

Subsection (c) proposes an appeal process for changes to the “List of Approved TIF Tarpaulins.” Providing an appeal process for the addition, denial, amendment, or removal of approved TIF tarpaulins on DPR’s “List of Approved TIF Tarpaulins” will ensure that tarpaulin manufacturers have the opportunity, and know the proper procedure, to understand and appeal DPR’s decision to add, deny, amend, or remove a tarp from the approved list. The proposed process is consistent with the process to appeal to the Director a CAC’s decision to levy a civil penalty against a person, set forth in FAC section 12999.5(d) including the 30-day appeal period; the requirement to submit written grounds for the appeal and evidence for the Director’s consideration; and a 45-day period or as soon thereafter as practical, for the Director to render a written decision.

If a TIF tarpaulin is used for 1,3-D fumigation, subsection (d) proposes that it meet the requirements in subsection (a) at the time of the application. This ensures that DPR has evaluated and currently approved the TIF tarpaulin.

Renumber and Amend Previous 3 CCR Section 6448.1 as New Section 6448.2. 1,3-Dichloropropene Field Fumigation Methods.

DPR proposes to amend and renumber previous section 6448.1 to new section 6448.2.

DPR proposes to move the maximum application rate from existing subsection (a) to “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” a document incorporated by reference in section 6448(d), because the maximum application rate will vary depending on the fumigation method, season, setback distance, and application block size.

Subsection (a) will be replaced with proposed TIF and non-TIF tarpaulin requirements for field soil fumigations of 1,3-D. Proposed subsection (a)(1) prohibits the use of both TIF and non-TIF tarpaulins in the same application block. It is necessary for an application block to be covered with tarpaulins in the same permeability category because TIF and non-TIF fumigation methods have different setback requirements, and the appropriate setback distance cannot be determined if an application block uses a combination of both tarpaulin types. The tarpaulin burial requirement in proposed subsection (a)(2) is an existing requirement relocated from subsections (d)(2)(C), (d)(4)(B), and (d)(6)(B). The tarpaulin plan requirements in proposed subsection (a)(3) are existing requirements relocated from subsections (d)(2)(E), (d)(4)(E), (d)(6)(D). The relocated existing requirements include “The factors used to determine when tarpaulin repair will be conducted, including hazard to the public, residents, or workers; proximity to occupied structures, size of the damaged area(s); timing of damage; feasibility and response time of repair; and environmental factors such as wind speed and direction.” DPR proposes to revise the current tarpaulin plan requirements by adding requirements to make the plan consistent with the label requirements for other fumigants, including chloropicrin. Several registered products contain both 1,3-D and chloropicrin, so, by proposing requirements that are consistent with other fumigant labels, a single tarpaulin plan will be able to meet the requirements for both pesticides. The TIF tarpaulin cutting and removal requirements in proposed subsection (a)(4) are existing requirements relocated from

subsections (d)(2)(D) and (d)(4)(C). DPR proposes to revise the requirement to cut or perforate TIF tarpaulins from the current no sooner than nine days after the application, to no sooner than ten days after the application. The revision is based on the analysis described in Brown. (2022).

Existing subsection (b) is being renumbered to (b)(2). Based on the analysis in Brown (2022), proposed subsection (b) requires an application block to have a minimum soil moisture of 50 percent of field capacity at a depth of three to nine inches below the surface when the fumigation occurs, except for drip chemigation applications that inherently meet this requirement. Currently, 1,3-D product labels require a minimum soil moisture of 25 percent of field capacity at the same depth. DPR proposes the more stringent soil moisture of 50 percent of field capacity to reduce 1,3-D and VOC emissions. Elevated soil moisture reduces emissions primarily by acting as a physical barrier that slows the diffusion of 1,3-D throughout the soil, allowing additional time for the fumigant to degrade and reducing 1,3-D emissions into ambient air. Most field soil fumigations likely already meet the proposed soil moisture requirement, and if this requirement is not included, the setback requirements would be more stringent. To ensure the soil moisture requirement is met, one of three options in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” a document incorporated by reference, must be used.

DPR proposes to revise subsection (c) to require applications for tree and grape crops to use a fumigation method in subsection (d) with an injection point at least 24 inches below the soil surface or a TIF tarpaulin that meets the requirements in section 6448.1. This requirement will ensure that a township cap is not needed to mitigate cancer risk for non-occupational bystanders. Segawa and Luo (2022) shows that the highest historical use of 1,3-D may cause air concentrations to exceed 0.56 ppb for one year and these exceedances are associated with applications for tree and grape crops that use fumigation methods with an injection depth of 18 inches. The pilot project described above developed the new 24-inch injection method specifically to reduce 1,3-D emissions for applications to tree and grape crops.

DPR proposes to relocate the strip fumigation restriction in existing subsection (c) to new subsection (c)(1) and revise it so that it continues to apply to the five ozone nonattainment areas during the May through October ozone season, but not statewide. Strip fumigations reduce short-term emissions by fumigating every other row and effectively decreasing the application rate to make compliance with setback distance requirements easier. However, the long-term VOC emissions are the same because the skipped rows are fumigated at a later date, so the prohibition of strip fumigations must be continued to achieve VOC reductions in the ozone nonattainment areas.

Subsection (d) includes general descriptions of the fumigation methods allowed. DPR proposes to revise subsection (d) to require the specific fumigation methods used to be identified by a code in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” a document incorporated by reference. DPR also proposes to clarify that the VOC requirements only apply to field soil fumigations during the May through October ozone season. Brown (2022) describes updates to DPR’s estimates of VOC (500-hour or 21-day) emissions for each fumigation method. Based on the updated emission estimates, some fumigation methods change their current designation from “low-emission” to “high-emission” and are proposed to be prohibited in three of the ozone nonattainment areas during May through October. This includes changing the designation of some broadcast fumigations methods from low-emission to high-emission. DPR also

proposes to change the requirements for a TIF tarpaulin from one approved by U.S. EPA to the more stringent requirements proposed in section 6448.1. As discussed above, DPR's more stringent requirements are based on measuring tarpaulin permeability under high humidity, which is more representative of field conditions.

As discussed above, tarpaulin requirements in existing subsections (d)(2), (d)(4), (d)(6), and (e) are being relocated to subsection (a).

DPR proposes to renumber subsection (f) to subsection (e), reorganize and reword the existing requirements for clarity and readability. Additionally, DPR proposes to add a provision in subsection (e)(1) allowing use of a new 1,3-D fumigation method if approved pursuant to section 6448.3. DPR proposes to require the data and analysis in section 6448.3 as well as the current requirements for interim approval of a new fumigation method. This will provide the necessary flexibility for innovations that reduce emissions and to provide consistency with existing regulations (3 CCR section 6452).

DPR also proposes to amend the authority and reference note to include a relevant citation, FAC section 14024.

#### Adopt 3 CCR Section 6448.3. New 1,3-Dichloropropene Fumigation Methods.

Proposed section 6448.3 establishes a process to evaluate and allow new fumigation methods for 1,3-D. This proposed section is similar to and consistent with section 6452 for interim approval of fumigation methods for reduced VOC emission purposes. New fumigation methods (e.g., new tarpaulins, irrigation techniques) with lower emissions than the methods described here can be developed. This proposed section will provide the necessary flexibility for innovations to occur. This will allow improved fumigation methods or procedures to be used sooner. The proposed section requires the data necessary to estimate emissions and determine the setback distance and related requirements. The criteria and process for evaluating the data for new fumigation methods are the same as current requirements in section 6452, except that the data is used to determine the setback distance and related requirements instead of the VOC emissions specified in section 6452. It is likely that the same data will be evaluated for both sections.

Proposed subsection (c) would require the Director to publish a notice of interim approval of a field fumigation method under subsection (a) on DPR's Web site. The approval will expire three years after the approval date. During the 3-year interim period, DPR may complete formal rulemaking to allow continued use of a new fumigation method. This process is consistent with the process in section 6452 and will provide the necessary flexibility for innovations to occur while DPR develops new regulations.

#### Adopt 3 CCR Section 6448.4. Annual 1,3-Dichloropropene Report.

Proposed section 6448.4 requires DPR to issue an annual report that includes the following information for the previous calendar year, as specified in subsection (a):

- 1) a list of ten townships described below and monitoring locations with air concentrations more than the thresholds described below, and

2) an evaluation of specified townships and monitoring locations.

Proposed section 6448.4 provides for ongoing monitoring and verification that the requirements proposed in this rulemaking address both the acute and cancer risks to non-occupational bystanders by tracking and evaluating 1,3-D use and air monitoring data. To ensure that the annual report evaluation includes a variety of crops, fumigation methods, use patterns, and weather conditions, subsection (a)(1)(A) requires DPR to evaluate the township with the highest 1,3-D use in each of the ten counties with the highest 1,3-D use. The proposed township selection criteria include exceptions to avoid including townships that are in close proximity to each other. DPR proposes to evaluate ten townships to ensure that the evaluation includes the township with the highest potential air concentrations based on the amount of 1,3-D applied, the fumigation methods used to apply 1,3-D, crops, season and timing of field soil fumigations, and weather conditions. Ten townships are necessary to ensure the evaluation includes a sufficient range of these factors that affect 1,3-D air concentrations.

Since 2011, DPR has conducted ambient air monitoring in communities to help assess long-term exposure to 1,3-D. Current monitoring consists of weekly 24-hour samples collected at six high-use locations. As discussed above, DPR's 2016 (cancer) and 2021 (acute) risk management directives specify regulatory target concentrations of 0.56 ppb as a 70-year lifetime average to mitigate cancer risk to non-occupational bystanders and 55 ppb as a 72-hour average to mitigate acute risk to non-occupational bystanders. To verify that the proposed regulation achieves these regulatory targets, subsections (a)(1)(B) and (C) require DPR to evaluate monitoring locations that have concentrations greater than more stringent thresholds: 0.27 ppb as a 1-year average (cancer risk to non-occupational bystanders) or 55 ppb as a 24-hour average (acute risk to non-occupational bystanders).

As discussed above, proposed subsection (a)(2) requires DPR to conduct evaluations of the townships and monitoring locations listed pursuant to subsection (a)(1) to verify that the proposed requirements address 1,3-D acute and cancer risks to non-occupational bystanders. The evaluations include a determination of the major factors (e.g., crops and acreage) affecting 1,3-D use levels and air concentrations, and an assessment of monitoring data validity and representativeness. DPR may exclude or note some air monitoring data depending on the assessment. The evaluations will include computer modeling or other data analyses to estimate the peak 24-hour, peak 72-hour, and average 1-year air concentrations of 1,3-D for the previous calendar year. The estimated air concentrations will be compared to the estimates of air concentrations used to develop the proposed regulation. Where possible, the estimated air concentrations will also be compared to measured concentrations from air monitoring. If the estimated air concentrations are higher than the previous estimates for regulation development or detected air concentrations, the report will describe the action(s) DPR will take to address the higher air concentrations.

Proposed subsection (b) provides a public comment period for the draft annual report that is consistent with the regular rulemaking process, specifically Government Code section 11346.4(a).

#### Amend 3 CCR Section 6449.1. Chloropicrin Field Fumigation Methods.

As a result of the proposed renumbering of existing section 6448.1 to 6448.2, cross-references to



section 6448.1 are being amended to reflect the proposed renumbering. These are non-substantive changes.

#### Amend 3 CCR Section 6452. Reduced Volatile Organic Compound Emissions Field Fumigation Methods.

Due to the proposed renumbering of existing section 6448.1 to 6448.2, cross-references to section 6448.1 are being amended to reflect the proposed renumbering. These are non-substantive changes.

Additionally, subsection 6452(b) is currently printed twice. DPR proposes to correct this printing error by deleting one of the subsections.

DPR also proposes to amend the reference note to specify the code where the reference citations are located.

#### Amend 3 CCR Section 6452.2. Volatile Organic Compound Emission Limits.

Due to the proposed renumbering of existing section 6448.1 to 6448.2, cross-references to section 6448.1 are being amended to reflect the proposed renumbering. These are non-substantive changes.

#### Amend 3 CCR Section 6624. Pesticide Use Records.

DPR proposes to adopt subsection 6624(c)(8) specifying that pesticide use records for 1,3-D must also include the field fumigation method code referenced in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” a document incorporated by reference. Currently, this is only required for field soil fumigations of 1,3-D that occur in nonattainment areas between May and October. To evaluate use patterns specified by proposed section 6448.4, this reporting requirement is necessary year-round and statewide.

Due to the proposed renumbering of existing section 6448.1 to 6448.2, cross-references to section 6448.1 are being amended to reflect the proposed renumbering. These are non-substantive changes.

#### Amend 3 CCR Section 6626. Pesticide Use Reports for Production Agriculture.

DPR proposes to renumber existing subsection 6626(e) to 6626(f). Proposed subsection 6626(e) specifies that pesticide use reports for 1,3-D must include the field fumigation method code. This additional requirement is necessary for the reasons specified in section 6624. In addition, this subsection specifies that the use report required by subsection (d) is not required if a use report is submitted under subsection (e). This will ensure that duplicate reports are not submitted for field soil fumigations of 1,3-D in nonattainment areas.

#### Amend Section 6881. Annual Volatile Organic Compound Emissions Inventory Report

Due to the proposed renumbering of existing section 6448.1 to 6448.2, cross-references to section 6448.1 are being amended to reflect the proposed renumbering. These are non-substantive changes.

Document Incorporated By Reference: 1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024

This document, proposed to be incorporated by reference in sections 6448, 6448.2, 6624, and 6626, contains an overview of the regulations proposed in this rulemaking and is organized into three main sections: 1) minimum requirements for all field soil fumigations, 2) field fumigation methods allowed, and 3) descriptions of allowed fumigation methods and tables of allowed combinations of setback distance, application rate and application block size. The document includes figures, tables, and other information that is too cumbersome to include in the regulation text. The document also reiterates and clarifies or provides more details of the regulation text. It is the Department's intent that this document has full regulatory effect.

The document subsection on setback restrictions expands on the text in subsection 6448(b). It further clarifies which sites/areas are subject to setback requirements. The document also provides guidance on other indoor and outdoor areas that the CAC may consider similar to occupied structures and apply the setback requirements.

The document subsection on setback distance expands on the text in subsection 6448(b). The proposed minimum setback distance is 100 feet to be consistent with and as stringent as label requirements. The proposed maximum setback distance is 500 feet depending on the season, fumigation method, application rate, and application block size (acres). This distance is based on discussions with CACs, growers, and applicators about the longest feasible distance that can be complied with and enforced based on the number of structures potentially affected and the maximum distance that can be accurately measured for both structures and the proposed overlapping fumigations requirements. A figure illustrates the measurement of the setback distance from occupied structures to a 1,3-D application block. DPR proposes a series of tables that specify the allowed combinations of fumigation method, season, setback distance, application rate, and application block size (acres). Allowed combinations are those with 95 percent probability that air concentrations will be no more than 55 ppb as a 72-hour average at the setback distance. The tables are too cumbersome to include in the regulation text, so they are proposed to be specified in this document.

The document subsection on overlapping field soil fumigations expands on the text in subsection 6448(c) by reiterating the requirements and illustrating the requirements with a figure.

The document subsection on maximum application rate (page 4) expands on the text in subsection 6448(d) and includes an explanation of broadcast equivalent application rate. The broadcast equivalent application rate accounts for alternating treated and untreated areas when a bed or strip fumigation is conducted. An explanation is necessary to differentiate this application rate from the standard application rate on product labels that is used to ensure product efficacy. The proposed maximum broadcast equivalent application rate is 332 pounds of 1,3-D active ingredient per acre. This application rate is the lowest amount that will still achieve efficacy for certain deep-rooted crops such as nut trees and grape vineyards. The allowed application rate can be lower depending on the season, setback distance, fumigation method, and application block size. DPR proposes a series of tables that specify the allowed combinations of fumigation method, season, setback distance, application rate, and application block size (acres). Allowed combinations are those with

95 percent probability that air concentrations will be no more than 55 ppb as a 72-hour average at the setback distance. The tables are too cumbersome to include in the regulation text, so they are proposed to be specified in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” incorporated into the regulation text by reference.

The document subsection on application blocks expands on the text in subsection 6448(e). Application block (page 4) is already defined in section 6000. The proposed maximum application block size is 80 acres. This is generally the most acreage and that can be fumigated in one day. This application block size is also part of the basis for the overlapping field soil fumigations requirements in section 6448(c). Larger blocks would require more stringent overlapping requirements. The allowed application block size can be less than 80 acres depending on the season, setback distance, application rate, and fumigation method. DPR proposes a series of tables that specify the allowed combinations of fumigation method, season, setback distance, application rate, and application block size (acres). Allowed combinations are those with 95 percent probability that air concentrations will be no more than 55 ppb as a 72-hour average at the setback distance. The tables are too cumbersome to include in the regulation text, so they are proposed to be specified in “1,3-Dichloropropene Field Fumigation Requirements, Est. January 1, 2024,” incorporated into the regulation text by reference.

The document subsection on soil moisture expands on text subsection 6448.2(b). The text specifies the performance standard for minimum soil moisture of 50 percent of field capacity. The document subsection (pages 5 – 11) provides three options to comply with the performance standard. Option 1 requires a minimum amount of irrigation prior to fumigation with 1,3-D. This option is the simplest, but likely requires the most water for compliance. Option 2 is a simple but subjective field test procedure developed by the U.S. Department of Agriculture (USDA, 1998), similar to the one specified by product labels modified for a higher moisture requirement. Product labels specify the USDA feel and appearance procedure to determine if the soil moisture is at least 25 percent of field capacity. The proposed document modifies the USDA feel and appearance procedure specified by product labels for a soil moisture requirement of at least 50 percent of field capacity. Option 3, developed by DPR (Tuli et al, 2022), is the most accurate method. However, this method takes more time than Option 2 and requires purchase of a soil moisture sensor. Figures provide more details and illustrate the procedures for Options 2 and 3. Property operators and applicators will usually have the discretion to select any of the options, but the CAC has the discretion to specify an option in permit conditions.

Proposed document Section 2 expands on the fumigation method requirements in subsection 6448.2(d). It contains Table 1, an index of the specific 1,3-D field fumigation methods allowed with their corresponding field fumigation method (FFM) codes, and references to regulation subsections and setback tables. Additionally, for reference, Table 1 also designates which fumigation methods are high-VOC emission and prohibited in certain ozone nonattainment areas during May–October, specified by section 6448.2(d). The FFM code is a more specific and easier-to-use identifier of fumigation method than the regulation text subsection. The FFM code is used to identify the fumigation method for notices of intent, pesticide use reports, and other regulatory purposes.

Proposed document Section 3 also expands on the fumigation method requirements in subsection 6448.2(d). It includes descriptions of allowed fumigation methods. It also includes Tables 2 – 9 that specify the allowed combinations fumigation method, season, maximum application rate, maximum application block size, and minimum setback distance that achieve the regulatory target concentration of 55 ppb as a 72-hour average. The setback tables are based on the analysis described in Luo (2022a).

For each allowed fumigation method, DPR proposes different setback distance requirements for different seasons. DPR proposes a winter season of November through February, and a non-winter season of March through October. DPR's current recommended 1,3-D permit conditions prohibit field soil fumigations during December. This requirement is based on air monitoring data showing higher air concentrations during this month, primarily due to longer nights with low wind speeds and more stable atmospheric conditions. The proposed setback distances are based on computer modeling of hypothetical air concentrations that found air concentrations during January were slightly higher than December, and that air concentrations during February and November were lower than December and January, but higher than other months (Luo and Brown, 2022). Therefore, more stringent mitigation measures are necessary during November through February. DPR proposes to replace the December prohibition with more stringent requirements during November – February. The section on alternatives contains additional information on this analysis and rationale.

#### CONSULTATION WITH OTHER AGENCIES

DPR formed a TAC workgroup to comply with the consultation required by FAC section 14024. In addition to the California Agricultural Commissioners and Sealers Association and the Air Pollution Control Districts required by FAC section 14024, the workgroup included representatives from CARB and OEHHA. The TAC workgroup also included a representative of CDFG to fulfill the consultation specified in FAC section 11454 and the January 15, 2019, Memorandum of Understanding developed pursuant to FAC section 11454.2. In compliance with FAC section 14024, the TAC workgroup provided comments on the draft regulation text and related documents (DPR, 2022a).

DPR also consulted with Agricultural Pest Control Advisory Committee, as required by FAC section 12047 (Brajkovich, 2022; DPR, 2022b), and the Pesticide Registration and Evaluation Committee (DPR, 2022c; DPR, 2022d).

As stated above, the scientific analysis behind the proposed regulations focus exclusively on mitigating the acute and cancer risks to residential/non-occupational bystanders from exposure to 1,3-D in ambient air. That is, DPR analyzed an individual's exposure risks from 1,3-D—including children—with 24-hour/7-days a week exposure to 1,3-D in the ambient air over the course of 70 years living in a high 1,3-D use area for cancer risk and 72-hour exposure for acute risk. Accordingly, DPR's proposed draft regulations are designed solely to address acute and cancer risks to non-occupational bystanders, including children, from exposure to 1,3-D and are not worker safety regulations subject to joint and mutual development with OEHHA as set forth in FAC sections 12980 and 12981 (Rubin, 2022).

In response to DPR's request, OEHHA agreed that since the purpose of DPR's proposed regulations is to address risks to non-occupational bystanders and not workers, the proposed regulations are not subject to joint and mutual development process set forth in FAC sections 12980 and 12981. (Morrison, 2022; Edwards, 2022).

#### ALTERNATIVES TO THE PROPOSED REGULATORY ACTION PURSUANT TO GOVERNMENT CODE SECTION 11346.2(b)(4)

Performance standards were considered and included where possible. For example, the proposed requirements for a TIF tarpaulin include a performance standard for permeability of 0.046 centimeters per hour. TIF tarpaulin manufacturers can meet this standard by adjusting the tarp composition, number of layers, layer thickness, or other manufacturing techniques to meet the standard. Additionally, the proposed regulation includes three options to comply with the soil moisture requirement of 50 percent of field capacity.

DPR considered label changes because U.S. EPA is currently evaluating possible changes to 1,3-D label requirements and issued an updated proposed interim decision in August 2022. However, U.S. EPA's assessment of health risks differs from DPR's (DPR, 2015b), and U.S. EPA proposes to find that non-occupational bystander exposures do not need further mitigation. U.S. EPA proposes to require a fumigation management plan (FMP), consistent with label requirements for other fumigants. The proposed FMP requirements are consistent with DPR's proposed regulations, including the proposed requirements for a tarpaulin plan.

DPR has not identified any feasible alternatives to the proposed regulatory action that would lessen any adverse impacts, including any impacts on small businesses, and invites the submission of suggested alternatives. DPR considered the following alternatives during the development of this proposed action.

*Prohibit December field soil fumigations* – DPR's current recommended 1,3-D permit conditions prohibit field soil fumigations during December. This requirement is based on air monitoring data showing higher air concentrations during this month, primarily due to longer nights with low wind speeds and more stable atmospheric conditions. The proposed setback distances are based on computer modeling (verified by comparison to monitoring data) that indicates air concentrations during January are slightly higher than December. While air concentrations during November and February are lower than December and January, they are higher than other months (Luo and Brown, 2022, Table 7). DPR compared two different setback requirements: one for a December prohibition using weather data for the January – November 11-month period (Luo, 2022b) and a second one for seasonal setbacks during November – February and March – October (Luo, 2022a). Shifting to two seasonal setbacks resulted in less stringent setbacks for both seasons in comparison to a December or longer prohibition. Moreover, this analysis used the higher air concentrations during December and January and excluded the lower air concentrations for November and February in determining the setback distance and other requirements for a 4-month winter season. The economic analysis by CDFA and the University of California, Davis (UCD) (Goodhue, et al., 2022a and 2022b) also indicates a lower economic impact to growers and applicators with the seasonal setbacks compared to a December (or longer) prohibition. Therefore, DPR proposes the seasonal setbacks specified in "1,3-Dichloropropene Field Fumigation Requirements, Est. January

1, 2024,” incorporated by reference, as opposed to a December prohibition, because seasonal setbacks still achieve the health protective regulatory target concentration with less economic impact.

*No soil moisture requirement* – Section 6448.2(b) proposes a minimum soil moisture of 50 percent of field capacity at a depth of three to nine inches below the surface, except for drip chemigation applications that inherently meet the requirement. Current 1,3-D product labels require a minimum soil moisture of 25 percent of field capacity at the same depth. DPR proposes the more stringent soil moisture to reduce 1,3-D and VOC emissions. If this soil moisture requirement is not included, the setback distances would be more stringent. DPR proposes a higher soil moisture instead of more stringent setback distances because the higher soil moisture will have less economic impact (Goodhue, et al., 2022a and 2022b), even under drought conditions. To achieve 50 percent soil moisture, a likely one-time maximum irrigation of three inches of water is needed. This amount of water is less than five percent of the annual amount of irrigation for most crops fumigated with 1,3-D, and less for the lifetime of perennial crops. If drought conditions prevent achieving the proposed soil moisture it is unlikely that the current soil moisture requirement can be achieved or a crop can be grown. The proposed soil moisture requirement should be feasible because chloropicrin product labels (including products containing both 1,3-D and chloropicrin) currently require 50 percent soil moisture. Additionally, the setback distance requirements are based on soils data from 21 fields just prior to fumigation. The average soil moisture for these 21 fields was greater than 50 percent. Based on the chloropicrin requirement and the data from 21 fields, it is likely that most 1,3-D field soil fumigations already meet the proposed requirement.

*Require TIF tarpaulins* – DPR considered requiring the use of TIF tarpaulins to reduce emissions of 1,3-D. However, DPR determined that this alternative would be very costly to implement. TIF tarps cost approximately \$1,150 per acre and can only be used once (Goodhue, et al., 2022a). In 2020, over 60,000 acres were treated with 1,3-D, and only 17,000 acres used TIF tarps. The estimated cost of requiring every grower to use TIF tarps is approximately \$49 million annually. This would pose a significant impact to businesses without being more health protective than the proposed fumigation methods, which have been identified through DPR’s pilot project as achieving emissions reductions comparable to TIF tarping.

#### EVIDENCE SUPPORTING NO SIGNIFICANT ADVERSE ECONOMIC IMPACT ON BUSINESS PURSUANT TO GOVERNMENT CODE SECTION 11346.2(b)(5)(A)

While the proposed regulations will have a statewide economic impact directly affecting businesses, the impact will not be significant, including the ability of California businesses to compete with businesses in other states. CDFA and UCD evaluated the potential economic impact of the proposed regulations, and the following is a summary of their report (Goodhue, et al., 2022a and 2022b). Additionally, CDFA estimated the number of businesses (farms) affected by the proposed regulations (Mace, 2022). Their evaluation examined the mitigations for acute risk by evaluating how growers could comply with the proposed regulations regarding the relationships between the allowable application method, setback distances to occupied structures, and application block size. It estimates the economic impacts associated with these proposed changes.

In general, the higher the application rate and shorter the distance to an occupied structure, the lower the maximum application block size for each application method. The maximum permitted block size can range from 0 acres (application not permitted) to a maximum of 80 acres for some application methods and rates. For untarped field soil fumigations, the proposed maximum block size has been reduced to achieve the minimum 100 ft setback distance from occupied structures even with new application methods. Current restrictions allow any block size while maintaining a 100 ft setback distance from occupied structures.

The cost of complying with the proposed regulation for acute risk was examined in two ways. First, the cost for all 1,3-D field soil fumigations to comply with the proposed changes was evaluated by adopting, if needed, a new application method and/or reducing block size to retain a 100 ft setback distance and current application rate, regardless of whether the field soil fumigations are in fact near an occupied structure. This approach identifies how costly the proposed changes would be if all field soil fumigations had to comply with the combinations of application rate, application method, and maximum block size permitted under the proposed regulation. This analysis uses data on field soil fumigations from 2017-2020 (Method 1). Second, for three focal counties in 2017-2018, Fresno, Kern, and Stanislaus, geographic information system (GIS) data was integrated with application data and only those field soil fumigations within certain distances of occupied structures were isolated. Next, the amount of acreage that would have been impacted directly for all crops was estimated, and the associated mitigation cost (Method 2). However, it was uncertain whether all field soil fumigations examined using Method 2 are ones that would have been impacted by the occupied distance restriction because fields, not field soil fumigations, are mapped. If not all of a field was fumigated with 1,3-D, it is conceivable that the proposed setback distance for that application would not be binding.

The estimated statewide costs are:

<b>Year</b>	<b>Total Cost</b>
2017	\$1,425,081
2018	\$1,546,033
2019	\$1,020,278
2020	\$1,471,936
Average	\$1,365,832

The estimated costs per business for the first five years of the proposed regulations are:

Type of Business	Initial Costs	Annual Ongoing Costs
Small – independently owned and operated, not dominant in its field of operation, and has fewer than 100 employees	\$849 - \$2187	\$849 - \$2187
Typical	\$849 - \$2187	\$849 - \$2187

ECONOMIC IMPACT ASSESSMENT PURSUANT TO GOVERNMENT CODE SECTION 11346.3(b)

Creation or Elimination of Jobs within the State of California: The proposed action will not likely create or eliminate jobs within California. DPR proposes to establish setback distances and fumigation method restrictions for each 1,3-D application, and the proposed requirements are

similar to current requirements for other fumigants. As with other fumigants, businesses will manage the setbacks by shifting to fumigation methods with lower emissions and/or breaking up large fields into smaller blocks and fumigate sequentially over several days. These changes will not lead to the creation or elimination of jobs within California.

**Creation of New Businesses or the Elimination of Existing Businesses within the State of California:** The proposed action would not create new businesses or eliminate existing businesses currently doing business within the State of California. The proposed regulations require minimal changes in processes, services, and equipment for compliance, and the changes can easily be achieved by existing businesses. Therefore, the proposed regulations will not lead to the creation or elimination of existing businesses within California.

**The Expansion of Businesses Currently Doing Business within the State of California:** The proposed action will not likely result in an expansion of businesses currently doing business within the State of California. The proposed regulation requires minimal changes in processes, services, and equipment for compliance, and the changes can easily be achieved by existing businesses. Therefore, the proposed regulations will not lead to expansion of businesses within California.

**The Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:** The proposed action is designed to reduce and mitigate the potential acute and cancer risk of 1,3-D to non-occupational bystanders and reduce VOC emissions to reduce ozone levels. While the proposed regulations will reduce the health risk, the reduction will vary depending on several factors including a person's distance from a 1,3-D application, the amount of 1,3-D applied, and weather conditions during applications. DPR is not aware of any methods to quantify the health benefits or monetary value of actions to reduce acute or cancer risk to pesticides. Moreover, the uncertainties in evaluating risk make estimating benefits even more difficult. For example, while DPR has established specific target concentrations, exceeding the targets increases the probability that adverse health effects might occur, not that they will occur. Quantifying the benefits for 1,3-D is particularly difficult because the risk characterization document (DPR, 2015b) indicates that the 55 ppb regulatory target concentration for acute risk is to mitigate a potential decrease in weight gain for infants and children. While other health impacts might be associated with this effect, the direct benefits of avoiding this effect are uncertain.

**IDENTIFICATION OF ANY SIGNIFICANT ADVERSE ENVIRONMENTAL EFFECT THAT CAN REASONABLY BE EXPECTED TO OCCUR FROM IMPLEMENTING THE PROPOSAL PURSUANT TO CALIFORNIA CODE OF REGULATIONS, TITLE 3, SECTION 6110**

The Secretary of Natural Resources determined that DPR's pesticide regulatory program, including the adoption, amendment, and repeal of pesticide regulations, qualifies as a certified regulatory program under Public Resources Code section 21080.5 and 14 CCR section 15251(i). This determination means DPR's pesticide regulatory program is functionally equivalent to the California Environmental Quality Act's (CEQA) requirements for preparing environmental impact reports (EIRs), negative declarations, and initial studies, and is therefore exempt from such requirements. This initial statement of reasons serves as the public report required under 3 CCR section 6110 and satisfies the requirements of DPR's CEQA certified regulatory program for rulemakings at 3 CCR section 6110-6116.



DPR's public report, as the substitute document satisfying CEQA functional equivalency requirements, must include a description of the proposed activity, and either (A) alternatives to the activity and mitigation measures to avoid or reduce any significant effects that the project might have on the environment, or (B) a statement that DPR's review of the project showed that the project would not have any significant effects on the environment and therefore no alternatives or mitigation measures are proposed to avoid or reduce any significant effects on the environment (3 CCR section 6110). DPR shall not adopt a regulation that would cause a significant adverse environmental impact if there is a feasible alternative or mitigation measure that would substantially lessen those significant adverse environmental impacts (3 CCR section 6116).

Under existing law, any pesticide sold or used in California must first be registered by U.S. EPA and also registered with DPR (7 U.S.C. section 136a(a); FAC section 12815 and 12993). DPR must conduct a thorough and timely evaluation before a pesticide is registered to ensure, among other things, that the pesticide does not have serious uncontrollable adverse effects, the use is not more detrimental to the environment than the benefit, and there are no reasonable, effective, and practicable alternatives that are demonstrably less destructive to the environment (FAC section 12824, 12825). Once registered, a pesticide may only be used in compliance with the approved label and any additional restrictions imposed by DPR or CAC related to the use of that pesticide (FAC section 12973). The pesticide product label includes use restrictions that are designed to address potential adverse impacts to human health and the environment (3 CCR section 6254).

1,3-D is currently listed as a restricted material in 3 CCR section 6400(e) and thus may only be purchased and used for agricultural production purposes under a restricted materials permit from the local CAC. Before issuing a permit, the CAC must evaluate the permit application to determine whether the intended use may cause a substantial adverse environmental impact based on local conditions at the application site. Depending on the results of this review, the CAC may deny the permit or impose permit conditions including the use of specific mitigation measures. (3 CCR section 6432.) As part of the permit for any restricted material, applicators must provide a notice of intent to the CAC at least 24 hours before any application. The notice of intent includes application-specific information, such as the number of acres being treated and date the application is intended to commence. (3 CCR section 6434.) After registration, if DPR receives a report of adverse effects, DPR must also investigate and if appropriate, reevaluate a pesticide that DPR's investigation finds may have caused or is likely to cause a significant adverse impact (3 CCR section 6220). In addition, DPR carries out an orderly program for the continuous evaluation of all registered pesticides (FAC section 12824).

1,3-D was introduced in California in 1970 and DPR has been managing the use of 1,3-D in order to protect human health and the environment since at least 1990. In 2015, DPR's comprehensive risk characterization document identified potential acute and cancer human health risks from 1,3-D inhalation exposure (Marks, 2015b). As described above, for fumigants such as 1,3-D, non-occupational bystander exposure occurs through inhalation as a result of off-site movement of 1,3-D from a treated field into ambient air. Inhalation exposure is a function of the fumigant emissions from the treated soil to air, the distance between the emissions and non-occupational bystanders, and the weather conditions when the emissions occur. 1,3-D is also a VOC and its emissions to the air contribute to the formation of ozone, a major air pollutant in California. In 2016, DPR

determined that its management strategy for mitigating cancer risks to non-occupational bystanders needed to be updated. (Marks, 2016b.) As a result, DPR implemented a maximum annual use limit in each township and other use restrictions through restricted material permit conditions and a memorandum of understanding with the registrant to control total emissions of 1,3-D to address cancer risk (exposure over 70 years) to non-occupational bystanders. More recent air monitoring and data analyses also indicated that additional mitigation measures were needed to address short-term acute exposures to non-occupational bystanders, including infants and children, from 1,3-D use. (Henderson, 2021.)

In order to address these risks, the proposed regulations will place additional and more stringent restrictions on the use of 1,3-D by establishing mandatory setbacks (zones where 1,3-D cannot be applied for a specified period of time); setting limits on the application rate and acres treated for individual applications; placing additional restrictions on seasonal applications and multiple applications that do not meet distance or time separation criteria; requiring more stringent soil moisture content for applications; and limiting applications to specific fumigation methods with corresponding setbacks and restrictions. As demonstrated above, the proposed restrictions on 1,3-D use outlined in DPR's proposed regulations are projected to reduce overall emissions and potential exposure to 1,3-D to mitigate acute and cancer risks to non-occupational bystanders.

DPR's proposed regulations are not reasonably expected to cause a significant adverse effect on human health; flora (plants); fauna (fish and wildlife); water; or air. To the contrary, by placing additional and more stringent restrictions on the use of 1,3-D than are currently in place, DPR's proposed regulations are expected to reduce overall emissions and potential exposure to 1,3-D in the ambient air, thereby benefiting human health. The proposed mitigation measures will also further reduce the emissions of 1,3-D as a VOC.

DPR's proposed regulations are significantly more protective than existing California laws and practices. Under the proposed regulations, each pound of 1,3-D used will result in less 1,3-D air emissions and less human health exposure than under existing conditions. Under the proposed regulations, fumigations of tree orchards and grape vineyards, which historically used a high poundage of 1,3-D and the 18-inch depth fumigation method, will be required to shift to a 24-inch depth fumigation method. This change in fumigation method will result in lower air emissions from 1,3-D use than under current requirements. Additionally, the proposed regulations require higher soil moisture prior to application. This increased soil moisture will create a physical barrier, which will reduce 1,3-D emissions (Brown, 2022). Against this environmental and regulatory baseline, no possible significant adverse effect to human health or the environment can reasonably be expected to occur from implementing the proposed regulations because the regulation will further restrict existing use and reduce overall emissions and exposure. Therefore, the proposed regulations are categorically exempt from environmental review under 14 CCR section 15061(b)(3). Because no significant adverse effect to human health or the environment can reasonably be expected to occur from implementing the proposed regulations, no alternatives or mitigation measures are proposed to lessen any significant adverse effects on the environment.

## EFFORTS TO AVOID UNNECESSARY DUPLICATION WITH FEDERAL REGULATIONS

The proposed regulatory action does not duplicate or conflict with any regulations contained within the Code of Federal Regulations because there are no federal regulations that address this issue. Only the U.S. EPA-approved product labels address soil field fumigation use of 1,3-D.

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