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## SEMIANNUAL REPORT SUMMARIZING THE REEVALUATION STATUS OF PESTICIDE PRODUCTS DURING THE PERIOD OF January 1, 2009 THROUGH June 30, 2009

California regulations require the Department of Pesticide Regulation (DPR) to investigate reports of possible adverse effects to people or the environment resulting from the use of pesticides. If a significant adverse impact occurred or is likely to occur, the regulations require DPR to reevaluate the registration of the pesticide.

Title 3, California Code of Regulations (3CCR), section 6221, specifies a number of factors under which DPR may initiate a reevaluation: (a) public or worker health hazard, (b) environmental contamination, (c) residue over tolerance, (d) fish or wildlife hazard, (e) lack of efficacy, (f) undesirable phytotoxicity, (g) hazardous packaging, (h) inadequate labeling, (i) disruption of the implementation or conduct of pest management, (j) other information suggesting a significant adverse effect, (k) availability of an effective and feasible alternative material or procedure that is demonstrably less destructive to the environment, and (l) discovery that data upon which a registration was issued is false, misleading, or incomplete. Often, ongoing DPR reviews trigger a reevaluation. Reevaluation triggers also include State and county pesticide use surveillance and illness investigations, pesticide residue sample analyses, environmental monitoring activities, and information from other state or federal agencies.

When a pesticide enters the reevaluation process, DPR reviews existing data. DPR requires registrants to provide additional data to determine the nature or the extent of the potential hazard or identify appropriate mitigation measures, if needed.

DPR concludes reevaluations in a number of different ways. If the data demonstrates that use of the pesticide presents no significant adverse effects, DPR concludes the reevaluation without additional mitigation measures. If additional mitigation measures are necessary, DPR places appropriate restrictions on the use of the pesticide to mitigate the potential adverse effect. If the adverse impact cannot be mitigated, DPR cancels or suspends the registration of the pesticide product(s).

This report complies with the requirements of 3CCR section 6225. Title 3, CCR section 6225 requires DPR to prepare a semiannual report describing pesticides evaluated, under reevaluation, or for which factual or scientific information was received, but no reevaluation was initiated. The report contains two sections:

- I. Formal Reevaluation - initiated when an investigation indicates a significant adverse impact has occurred or is likely to occur (see page 2); and



- II. Preliminary Investigations (Evaluations) - products or active ingredients for which DPR receives possible adverse factual or scientific information, but no reevaluation has been initiated (see page 18).

## I. FORMAL REEVALUATION

Undertaken when investigations indicate that a significant adverse impact has occurred or is likely to occur.

### BRODIFACOUM – 25 Products

Pesticide products containing brodifacoum are registered in California for the control of rats and mice in residential, industrial, commercial, agricultural, and public buildings. Registrants formulate the product with a grain-based bait in pellets, mini-pellets, and wax blocks. On December 30, 1999, at the request of the Department of Fish and Game (DFG), DPR placed pesticide products containing brodifacoum into reevaluation. DFG expressed concern that California's wildlife are exposed and may be adversely affected by currently registered uses of the anticoagulant rodenticide brodifacoum. This second generation rodenticide is hydrophobic, lipophilic, and the target rodent receives a delayed lethal dose with its first feeding. After multiple feedings, a rodent may have a significant "body burden" of this persistent pesticide at death.

Since the initiation of this reevaluation, DFG has identified several more incidents of non-target wildlife exposures to brodifacoum. Given the increased public interest in wildlife issues associated with brodifacoum and the length of time U.S. EPA had taken to complete its assessment, DPR began taking steps to address the problems associated with the use of brodifacoum, and two other second-generation anticoagulants, difethialone and bromadiolone. At a November 18, 2005 meeting of the Pesticide Registration and Evaluation Committee, DPR presented an issue paper recommending a number of mitigation measures.

In January 2006, DPR mailed letters to all current anticoagulant rodenticides registrants proposing that rodenticides baits containing brodifacoum, bromadiolone, and difethialone be restricted to indoor structural use only. DPR requested comments or alternate mitigation measures. In response to that letter, DPR received numerous responses, not only from registrants, but also from representatives of the pest control industry expressing concern over DPR's proposal. One consistent comment was that food-processing plants must place rodenticides outdoors in order to comply with federal law, which requires them to prevent entry by rodents into the premises. They felt that the placement of rodenticides baits indoors may encourage rodents to enter food-processing premises. A second consistent comment was that DPR should work with the U.S. EPA to develop mitigation measures.

In January 2007, U.S. EPA provided its proposed *Risk Mitigation Decision for Nine Rodenticides* and opened a 60-day public comment period, which was extended to May 18, 2007. DPR provided comments supporting U.S. EPA's proposed risk mitigation decision (RMD).

In May 2008, U.S. EPA announced their final *Risk Mitigation Decision for Ten Rodenticides*. The ten rodenticides can be grouped into first and second-generation anticoagulants and non-anticoagulants. The first-generation anticoagulant active ingredients include chlorophacinone, diphacinone, and warfarin. The second-generation anticoagulant active ingredients include brodifacoum, bromadiolone, difethialone, and difenacoum. The non-anticoagulants include zinc phosphide, bromethalin, and cholecalciferol. To minimize children's exposure to rodenticide products used in homes, U.S. EPA is requiring that all first-generation and non-anticoagulants rodenticide bait products marketed to residential consumers be sold as solid formulations preloaded in bait stations. To reduce wildlife exposures and ecological risks, U.S. EPA is requiring sale and distribution limits intended to minimize availability of second-generation anticoagulant products to residential consumers and require use of bait stations for all outdoor, above-ground uses. U.S. EPA's RMD is consistent with DPR's proposed mitigation measures. DPR will defer finalizing the reevaluation pending the outcome of U.S. EPA's efforts.

#### CHLOROPICRIN – 40 Products

Chloropicrin is a colorless liquid that volatilizes readily when released into the atmosphere. Chloropicrin has been used as an insecticide since 1917 and a soil fumigant since 1920. As a space and soil fumigant, chloropicrin controls nematodes, bacteria, fungi, insects, and weeds. Chloropicrin can be used alone or in combination with other fumigants such as 1,3-dichloropropene or methyl bromide. Small amounts of chloropicrin are added to methyl bromide and other fumigant applications as a warning agent.

Data submitted to DPR under the Birth Defect Prevention Act indicate that chloropicrin has the potential to cause adverse health effects at low doses. The National Institute for Occupational Safety and Health (NIOSH) set an 8-hour time-weighted average of 0.1 parts per million (ppm) as the reference exposure limit for workers exposed to chloropicrin. The NIOSH standard of 0.1 ppm was recommended primarily for the prevention of eye irritation in humans.

Pursuant to this reevaluation, DPR required chloropicrin registrants to conduct, and submit the results of, various worker exposure and air quality monitoring studies from field and greenhouse applications. DPR completed its review of the required monitoring data in August 2005. In November 2005, the CMTF responded to DPR's comments and questions regarding the studies. All of the data and information will be used in the risk assessment of

chloropicrin, which DPR anticipates submitting for external peer review in the third quarter of 2009.

#### CHLORPYRIFOS – 37 Products

The pesticide active ingredient chlorpyrifos is an insecticide registered for use on a variety of agricultural crops and turf for control of various insects. Chlorpyrifos is formulated as dusts, wettable powders, emulsifiable concentrates, concentrates, and ready-to-use solutions.

In March of 2004, DPR placed all agricultural use (includes turf use) products containing chlorpyrifos into reevaluation. The basis for the reevaluation is monitoring data collected by the Central Valley Regional Water Quality Control Board (CVRWQCB). The monitoring data showed chlorpyrifos levels in the rivers and tributaries of the San Joaquin Valley, the Sacramento/San Joaquin Delta, and Monterey County tributaries that exceeded water quality objectives (WQO) for aquatic invertebrates. Detections of chlorpyrifos have resulted in the development of an organophosphate pesticide Total Maximum Daily Load (TMDL) in identified segments of the San Joaquin River and Sacramento/San Joaquin Delta.

Pursuant to this reevaluation, chlorpyrifos registrants are required to identify the processes by which chlorpyrifos pesticide products are contributing to detections of chlorpyrifos in surface water at levels that exceed WQOs and identify mitigation strategies that have been shown to reduce or eliminate chlorpyrifos residues in surface water. The basic manufacturer of chlorpyrifos responded to the reevaluation with the submission of data and information. DPR reviewed the submitted information and agreed with the basic manufacturer's assessment of the modes of transport of chlorpyrifos residues to surface water. DPR then asked the basic manufacturer to identify mitigation strategies that will reduce or eliminate chlorpyrifos residues in surface water when used under California conditions for all major agricultural uses. In August 2005, the basic manufacturer identified mitigation measures that are intended to reduce chlorpyrifos residues in surface water when the products are used under California conditions.

In April 2008, the registrant submitted a final report entitled, "Surface Water Monitoring and Use Investigations for Determining Effectiveness of Chlorpyrifos Mitigation Measures – 2007 Final Report." In June 2008, DPR scientists reviewed the report and determined that the monitoring data indicate that chlorpyrifos continues to be detected at levels that exceed WQOs at most sites considered in the report. In addition, exceedances occur throughout the year and appear to result from numerous crops and application methods. As a result of this final report, DPR requested that the registrant evaluate all available monitoring data, including monitoring sites from the entire Central Valley and Central Coast, to determine if concentrations of chlorpyrifos in surface water are decreasing. In May 2009, the registrants submitted a final report entitled, "Historical Trend Analysis and Field Investigations of Chlorpyrifos Exceedances in Surface Water." DPR anticipates completing its review of the final report in the third quarter of 2009.

### CYFLUTHRIN – 43 Products

The pesticide active ingredient cyfluthrin is a nonsystemic pyrethroid insecticide registered for use on numerous field, vegetable, and fruit crops, including citrus. In addition, DPR registers pesticide products containing cyfluthrin for use on lawns and ornamental plants, animals, and around industrial, institutional, agricultural, and household structures. DPR initiated the reevaluation on May 8, 1998, based on its investigation of a May 1997 outbreak of respiratory irritation reported among orange harvesters exposed to residues of cyfluthrin in Tulare County and other pesticide illness reports related to cyfluthrin. As a part of the investigation of the Tulare County incident, DPR's Worker Health and Safety Branch conducted two separate inhalation-monitoring studies in orange groves during orange harvest. DPR determined that as dust and pollen are a part of the normal working environment, something different in the work environment led to the workers' respiratory irritation symptoms. DPR believes that the application of cyfluthrin to the citrus groves close to harvest led to the respiratory symptoms experienced. DPR compiled the results of its monitoring study in "Health and Safety Report, HS – 1765."

In October 2001, the basic manufacturer submitted the following: two worker exposure studies regarding hand harvesting of oranges and sweet corn; four indoor exposure studies; and a study entitled "Study on the RD<sub>50</sub> Determination in Rats." Based on this data, DPR determined that no further structural monitoring data were required. However, DPR determined that it had insufficient data regarding worker exposure during the hand harvesting of sweet corn, so DPR required a sweet corn worker exposure study. The results of the study were submitted to DPR in October 2004. All of the data and information will be used in the risk assessment of cyfluthrin, which DPR anticipates submitting for external peer review by the third quarter of 2010.

### DIAZINON – 4 Products

The pesticide active ingredient diazinon is an insecticide registered for use on a variety of agricultural crops, livestock, and turf for control of various insects. Diazinon is formulated as dusts, granules, wettable powders, seed dressings, emulsifiable solutions, impregnated materials, encapsulated materials, and concentrates.

DPR initiated the reevaluation of diazinon products labeled for use as dormant sprays based on monitoring studies conducted between 1991 and 2001 by the U.S. Geological Survey, Dow AgroSciences, DPR, the CVRWQCB and the State Water Resources Control Board (SWRCB). These studies demonstrate the presence of diazinon in surface waters of the Sacramento and San Joaquin Valleys at levels that exceed water quality criteria (WQC), especially during the dormant spray season.

To mitigate off-site movement of diazinon residues, registrants developed supplemental labeling for dormant spray products. The supplemental labeling adds mitigation measures, such as restricting application to ground equipment only, prohibiting application within 100 feet upslope of “sensitive aquatic sites,” and prohibiting application to orchards when soil moisture is at field capacity, or when a storm event is likely. The supplemental labeling is approved for use in California for all currently registered diazinon products.

In February 2008, DPR reviewed the information provided by the registrant. As an outcome, DPR determined that recent monitoring data needs to be evaluated to determine the relationship between diazinon use and exceedances of the WQC. In July 2008, the registrant submitted a final report entitled, “Analysis of Diazinon Environmental Monitoring Data from the Sacramento/Feather River Watersheds: 2001-2007” and “Project Report: Landguard OP-A as a Best Management Practice in Dormant Season Use, December, 2007.” In October 2008, the registrant submitted another final report entitled, “Analysis of Diazinon Environmental Monitoring Data from the San Joaquin River Watershed: 2001 – 2007.” DPR anticipates completing its review of the final reports in the third quarter of 2009.

CERTAIN AGRICULTURAL AND COMMERCIAL STRUCTURAL USE LIQUID FORMULATION PESTICIDE PRODUCTS (DATA CALL-IN) – 474 Products

On February 16, 2005, DPR placed certain liquid formulation agricultural and commercial structural use pesticide products into reevaluation. The basis for the reevaluation is concern about release into the atmosphere of volatile organic compounds (VOCs) from agricultural and commercial structural use pesticide products. VOCs and nitrogen oxides react in the presence of sunlight to create ground-level ozone. Ozone is a major air pollutant, harmful to both human health and vegetation. Many pesticide active ingredients and inert ingredients are VOCs.

The federal Clean Air Act requires states to submit state implementation plans (SIPs) for implementing, maintaining, and enforcing national ambient air quality standards (NAAQS) for air pollutants, such as ozone, in each air quality control region of California. Any region that does not meet the NAAQS for a given pollutant is designated as a federal nonattainment area (NAA). Currently, eight California air districts do not meet the NAAQS for ozone. In 1994, ARB submitted a SIP to U.S. EPA. The SIP included a pesticide element. The pesticide element (also referred to as the Pesticide SIP) addresses VOCs that result from the use of agricultural and commercial structural use pesticides. (Consumer pesticide product sources of VOCs are regulated by ARB.) In the Pesticide SIP, DPR committed to reducing VOC emissions from agricultural and commercial structural use pesticides by specified amounts within specified time periods for five NAAs. Three of the five NAAs do not meet the goals established in the 1994 SIP. These goals, relative to 1990 base year, were as follows: San Joaquin Valley, 12 percent reduction by 1999; Ventura, 20 percent reduction by 2005; and Southeast Desert, 20 percent reduction by 2007.

To implement the 1994 SIP, DPR developed a method to estimate the VOC content (emission potential) of pesticide products and to calculate estimated pesticide VOC emissions. DPR used thermogravimetric analysis (TGA) data to determine the VOC content of pesticide products and, in conjunction with data from DPR's pesticide use report system, calculated estimated annual VOC emission totals for those pesticide products. To obtain TGA data on agricultural and commercial structural use pesticides, DPR placed all agricultural and commercial structural use pesticides formulated as liquids into reevaluation in 1994, and all solid formulations into reevaluation in 1995.

However, during these reevaluations, DPR gave registrants the option of calculating the VOC emission potential of a pesticide product using water and/or inorganic subtraction, instead of submitting TGA data. In addition, if no data (either TGA or subtraction) were submitted for a given pesticide product, DPR assigned the product a default emission potential value based on the highest TGA value for the product's formulation category (default values were later revised to the median TGA value for each formulation category). As a result, DPR only had TGA data for approximately 30-40 percent of currently registered agricultural and commercial structural use pesticides. This meant that DPR's calculations of total VOC emissions from pesticide products might have been inaccurate. Pesticide products formulated as liquids (i.e., emulsifiable concentrates, aqueous concentrates, flowable concentrates, oils) constituted the bulk of products with unknown (default) emission potentials. DPR again placed these types of products into reevaluation and required the submission of TGA data on each product by December 31, 2005.

At the end of June 2009, 474 of the original 787 products placed into reevaluation remained actively registered in California. Registrants submitted TGA data for 339 products. DPR identified 97 products as not intended for agricultural or commercial structural use, and, therefore, exempt from DPR's data call-in. Registrants requested exemptions from generating TGA data for 38 products. DPR anticipates completing TGA data reviews and evaluation of requests for exemptions by the third quarter of 2009.

#### CERTAIN AGRICULTURAL AND COMMERCIAL STRUCTURAL USE LIQUID FORMULATION PESTICIDE PRODUCTS (REFORMULATION) – 523 Products

On May 31, 2005, DPR placed certain liquid formulation agricultural and commercial structural use pesticide products into reevaluation. The basis for this reevaluation is the same as the basis for the reevaluation listed in the previous section. However, the purpose of the reevaluation is different, and it targets 748 products.

DPR initiated the second reevaluation to meet the 1999 goal to reduce pesticide VOC emissions to 21 tons/day for the San Joaquin Valley NAA. Total pesticide VOC emissions in the San Joaquin Valley NAA were 23.2 tons/day for May-October 2002, and 26.5 tons/day for May-October 2003, exceeding the 1999 goal by 2.2 and 5.5 tons/day respectively.

Fumigants and pesticide products formulated as liquids make up most of the San Joaquin Valley pesticide VOC emission inventory. Fumigant products containing metam-sodium, 1,3-dichloropropene, and methyl bromide as primary active ingredients and chloropicrin as a secondary active ingredient comprise the largest portion of the San Joaquin Valley VOC emission inventory. However, fumigants are not amenable to reformulation. Liquid products, particularly those formulated as emulsifiable concentrates, are the next highest contributors to the pesticide VOC inventory. At that time, pesticide products formulated as liquids comprised approximately 40 percent of the pesticide VOC emission inventory in the San Joaquin Valley NAA area.

Staff analyses indicate that reformulation of the liquid pesticide products included in this reevaluation could result in significant VOC reductions in the San Joaquin NAA and throughout the State. Additionally, reformulation is one of the few regulatory options for which DPR can estimate VOC reductions using available data. Reformulation is likely a viable alternative only for liquid, non-fumigant pesticides. It is probably not possible or cost-effective to lower the VOC content of pesticides formulated as solids.

The list of pesticide products included in the reformulation reevaluation differs somewhat from the list of products included in the TGA data call-in. Pursuant to the reformulation reevaluation, registrants were required to choose one of the following three options for each product included in the reevaluation: submit a written commitment to reformulate the pesticide product to a VOC emission level of 20 percent or less, including information on how the product will be reformulated, a detailed timeline for accomplishing each task, and a schedule for progress reports; submit a request for exemption if the product does not meet the established reevaluation criteria; or submit a detailed explanation as to why the pesticide product cannot be reformulated. Registrant responses were due March 1, 2006.

At the end of June 2009, 456 of the original 748 products remained actively registered in California. Written commitments to reformulate were received, and are pending review, for 45 products. DPR exempted 270 products from reformulation because the products' VOC emission potential is less than 20 percent. The registrants for the remaining 141 products submitted one of the following responses: provided DPR with a detailed reason why reformulation is not feasible or contrary to VOC reduction; explained that the product registrant is a supplemental distributor that relies on the basic registrant to make a reformulation decision; or requested an exemption from reformulation because the TGA estimate is below 20 percent VOC. DPR is currently evaluating the registrant responses and anticipates reaching a decision by the fourth quarter of 2009.

#### CERTAIN PESTICIDE PRODUCTS CONTAINING PYRETHROIDS – 621 Products

DPR placed certain pesticide products containing pyrethroids into reevaluation on August 31, 2006. The reevaluation is based on monitoring surveys and toxicity studies revealing the widespread presence of pyrethroid residues in the sediment of both agricultural



and urban dominated California waterways at levels toxic to *Hyalella azteca* (*H. azteca*). Scientists conducted sediment bioassays using *H. azteca*, a resident species found in some Central Valley water bodies. Scientists commonly use *H. azteca*, an aquatic crustacean, as an indicator of environmental health and water quality in streams, lakes, and other bodies of water. Significant toxicity was observed at numerous sites. There was a high correlation between concentrations of pyrethroids and observed toxicity. Findings further indicate that the unique physical, chemical, and toxicological properties of the pyrethroid class of chemicals contribute to their propensity to accumulate in sediment at toxic levels.

Pyrethroids are synthetic insecticides. DPR did not include pesticide products containing pyrethrins in this reevaluation because pyrethrins are known to break down rapidly in the environment. Pyrethrins are naturally occurring insecticides found in *Chrysanthemum cinerariaefolium*, a perennial plant with a daisy-like appearance. Additionally, DPR excluded from this reevaluation the following product types: pressurized liquids, pressurized gasses, or pressurized dusts; chemicals impregnated into another material (e.g., ear tags, pet flea collars, ant disks/stakes, but not including fabric); and manufacturing use only products. DPR excluded these formulation categories because it is unlikely that the pyrethroids in these types of products will move into surface waters or sediments. Only formulations involving clothing (impregnated cloth and pressurized spray onto clothes) were included due to concerns that the pyrethroids may contribute to the contamination of surface water when the clothing is washed.

For purposes of data requirements, DPR divided pyrethroid chemicals into three groups. The first group (Group I) consists of the first generation or “Type I” photosensitive pyrethroids. Typically, these pyrethroids are used indoors and around residential areas. The active ingredients that fall into this group are bioallethrin, d-allethrin, imiprothrin, phenothrin, prallethrin, resmethrin, and tetramethrin. The second (Group II) and third groups (Group III) consist of the newer second-generation pyrethroids. The more toxic Group II and Group III pyrethroids, most of which are “Type II” pyrethroids, are less photosensitive, persist longer in the environment, and are widely used in both agricultural and urban settings. The two active ingredients in Group II, tau-fluvalinate and tralomethrin, have not been monitored or detected in California aquatic sediments. Group III pyrethroids have been detected on aquatic sediments, and include the following active ingredients: (s)-cypermethrin, beta-cyfluthrin, bifenthrin, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, fenpropathrin, gamma-cyhalothrin, lambda-cyhalothrin, and permethrin.

Pursuant to this reevaluation, registrants with products containing active ingredients in Group I are required to submit certain environmental fate data. Registrants with products containing active ingredients in Group II are required to submit: sediment persistence and ecotoxicology data; and monitoring in areas appropriate to use patterns. Registrants with products containing active ingredients in Group III are required to submit: certain environmental fate data; sediment persistence and ecotoxicology data; and transport

mechanisms and mitigation data. Registrants with products containing permethrin are required to conduct monitoring in Publicly Owned Treatment Works (POTWs).

### **Group I Active Ingredients**

By December 2007, DPR received the required environmental fate studies for all Group I active ingredients.

#### Imiprothrin

In March 2008, DPR completed its review of submitted imiprothrin environmental fate studies. Adequate data were submitted for soil adsorption coefficient and aerobic/anaerobic soil half-life. An acceptable water photolysis study must be submitted prior to DPR approval to add outdoor uses with non-pressurized formulations. The 12 actively registered products labeled for the control of ants and roaches consist of a formulation class that is exempted from the reevaluation.

DPR anticipates completing its review of the environmental fate data for the remaining active ingredients and determining whether additional sediment toxicity studies will be required by the third quarter of 2009.

### **Group II Active Ingredients**

In January 2007, a registrant with products containing tau-fluvalinate requested a waiver from all of the data requirements for Group II active ingredients based on low use in California. In September 2007, DPR notified registrants of pesticide products containing tau-fluvalinate and tralomethrin that additional studies were not required at this time. DPR's determination was based on the registrant's commitment to implement mitigation measures developed for products containing the Group III active ingredients with similar uses. All registrants agreed to implement mitigation measures in lieu of generating the required studies.

### **Group III Active Ingredients**

#### **Part 1 – Environmental Fate Data**

#### Esfenvalerate

In January 2007, DPR completed its review of submitted soil adsorption coefficient data and determined the data requirement is satisfied.

#### Gamma-Cyhalothrin

In October 2006, the registrant for gamma-cyhalothrin submitted a request to bridge the required anaerobic soil half-life data to existing anaerobic metabolism data on file for lambda-cyhalothrin. In February 2007, DPR denied the bridging request and required the anaerobic metabolism study be conducted and data submitted by the fourth quarter of 2009.

## **Part 2 – Sediment Persistence and Ecotoxicology Data**

### Sediment Analytical Method

In February 2007, the Pyrethroid Working Group (PWG) submitted two studies entitled, “6-Month Response to Pyrethroid Reevaluation Notice – Submission of Analytical Method” and “Method Validation for Determination of Residues of Several Pyrethroid Insecticides in Sediment.” In June 2007, DPR found the studies adequate to satisfy DPR’s analytical method data requirement for all Group III pyrethroids in sediment.

### Aerobic/Anaerobic California Sediment Half-Lives

In April 2007, the PWG submitted a study protocol entitled, “Aerobic Aquatic and Anaerobic Aquatic Degradation of Pyrethroid Insecticides in Three California Sediments.” In December 2007, DPR found the study protocol to be acceptable. The final results of this study are anticipated in the last quarter of 2009.

### Sediment Acute and Chronic Toxicity

In September 2007, DPR received study protocols for sediment toxicity. In December 2007, DPR received comments from U.S. EPA, SWRCB, CVRWQCB, UC Davis, UC Berkeley, TDC Environmental, and California Stormwater Quality Association (CASQA). In January 2008, DPR solicited comments from PWG on the stakeholder reviews received. In February 2008, PWG submitted acute and chronic toxicity tests performed for U.S. EPA on the active ingredients bifenthrin, cyfluthrin, cypermethrin, and esfenvalerate. In May 2008, DPR determined that a revised study protocol is necessary to address the stakeholder comments and incorporate PWG feedback by the second quarter of 2008. In July 2008, the PWG submitted their revised sediment toxicity testing proposal which was reviewed and found acceptable in September 2008. On April 1, 2009, DPR received the first of three progress reports on the PWG sediment toxicity testing program. In May 2009, DPR received the preliminary study on the impact of organic carbon on pyrethroid toxicity. DPR solicited comments from stakeholders and anticipates receiving feedback in the third quarter of 2009. In addition, DPR anticipates receiving the 10-day sediment toxicity tests with *H. azteca* and *Chironomus dilutus* and cold temperature studies in the second quarter of 2010. DPR deferred the 42-day *H. azteca* chronic studies two and one-half years after U.S EPA’s Office of Prevention, Pesticides and Toxic Substances (OPPTS) finalizes guideline 850.1735.

## **Part 3 – Transport Mechanisms and Mitigation**

### Investigations in Agriculture and Urban Settings

In July 2007, PWG submitted an overall plan to address transport mechanisms and mitigation, and explained how the submitted study proposals address off-site movement of pyrethroid residues. The two proposals are entitled “The Use of Agricultural Sediment

Basins as a Best Management Practice in Irrigated Tomatoes” and “Investigation of Sediment Toxicity in Kirker Creek and Pleasant Grove Creek Phase I: Ground Truthing Land Uses and Stormwater Input Points.” In May 2008, PWG submitted a final report entitled, “GIS Land Use Analysis of Kirker Creek and Pleasant Grove Creek Sampling Site Watersheds.” In September 2008, DPR reviewed the final report that provides insight into additional studies that could be conducted to identify sources of off-site movement from urban areas.

In July 2008, PWG submitted a final report entitled, “PWG 07-01: The Use of Agricultural Sediment Basins and PAM as Best Management Practices in Irrigated Tomatoes.” DPR anticipates reviewing this final report and allowing for stakeholder comment in the third quarter of 2009.

#### February 2008 Investigations of Urban Settings: Building Materials and Turf

In February 2008, PWG submitted two study proposals entitled, “Study Number 08-01: Building Material Wash-off Study” and “Study Number 08-02: Grass Runoff Study.” In April 2008, DPR received comments from U.S. EPA Headquarters and Region 9, SWRCB, and CASQA on these two proposals. In May 2008, DPR notified PWG that their study protocols should accomplish the stated objectives: identify the most important above ground building material scenarios for potential future management practice studies; and to compare runoff losses from grass irrigated under best practice to runoff losses from excessive lawn irrigation. In January and March 2009, DPR received the final reports entitled, “Quantification of Pyrethroid Runoff Losses from Treated Turfgrass Under Over-Irrigation Conditions and Simulated Rainfall” and “Washoff/Runoff of Cypermethrin Residues from Slabs of External Building Material Surfaces Using Simulated Runoff” respectively. DPR anticipates reviewing these final reports and stakeholder comments in the third quarter of 2009.

In May 2008, PWG submitted a 1989 study investigating the amount of runoff from products containing cyfluthrin applied to turf. In September 2008, DPR reviewed this study and found the information useful in mitigating pyrethroid use on turf. The study data will be combined with the results of PWG Study Number 08-02.

#### August 2008 Investigations of Urban Settings: Controlled Use Urban Monitoring

In August 2008, PWG submitted a concept study design entitled, “Study Number 08-03: Controlled Use Urban Monitoring Study.” In October 2008, DPR received comments from the San Francisco Bay Regional Water Quality Control Board, Lahontan Regional Water Quality Control Board, TDC Environmental, and UC Berkeley, CASQA, and U.S. EPA, Region 9. Later that month, the PWG postponed further development for this study due to lack of participating counties. In March 2009, DPR provided PWG with comments and requested a full study protocol before initiating the study. In April 2009, the PWG resubmitted study entitled, “Study Design for Study Number 08-03: Controlled

Use Urban Monitoring Study.” DPR anticipates reviewing this study design and stakeholder comments in the third quarter of 2009.

U.S. EPA coordination efforts with DPR: Early Mitigation Measures Addressing Urban Runoff through Product Labeling

In October 2007, DPR received comments from U.S. EPA Region 9, SWRCB, and CASQA on PWG’s July 2007 offsite movement study proposals. As a result of the comments received, DPR requested that PWG provide feedback on a number of early mitigation measures addressing urban runoff. The proposed early mitigation measures included modifying labels to do the following: prevent wash off of pre-construction termiticides; limit impervious surface applications; prohibit outdoor, above ground applications of pyrethroids prior to and during rain; and include additional water quality protection directions. In April 2008, PWG provided their perspective on the stakeholder reviews of the PWG study proposals and proposed early mitigation measures. In May 2008, PWG met with U.S. EPA to discuss the possibility of adding the early mitigation measures to labeling of all pyrethroid containing products.

In September 2008, U.S. EPA communicated their support of the early mitigation measures put forth by California stakeholders in October 2007, agreed to by PWG, Consumer Specialty Products Association (CSPA), and Responsible Industry for a Sound Environment (RISE) in April 2008. California stakeholders requested the implementation of early risk mitigation measures to address “unacceptable compliance risks and/or high compliance costs.” Under the “Pyrethroid Non-Agricultural Outdoor Labeling Initiative” it is anticipated that U.S. EPA's notification and self-certification process will be used by the registrants to add this early mitigation language to approximately 2,500 non-agricultural pyrethroid containing products. In October and November, DPR coordinated review of the initiative by California stakeholders and the State Federal Insecticide, Fungicide, and Rodenticide Act Issues Research Evaluation Group (SFIREG) working committee on Pesticides Operations Management (POM). SFIREG/POM is a national organization developed to exchange information with U.S. EPA about human health and environmental exposure to pesticides, and to provide input into U.S. EPA’s decision-making process. In February 2009, DPR coordinated the submission of SFIREG/POM comments on the proposed early mitigation labeling initiative to U.S. EPA. On June 4, 2009, U.S. EPA mailed 231 notification letters to registrants of the early mitigation label language. Specifically, the early mitigation labeling includes label statements that shall appear in the “Directions for Use” section based upon formulation and use specific statements. In addition, the early mitigation labeling implements PR Notice 2008-1 “Environmental Hazard General Labeling Statements on Outdoor Residential Use Products.” Amended labels bearing the early mitigation label language are due to U.S. EPA not later than June 4, 2010. DPR will work closely with U.S. EPA throughout this initiative process.

#### Offsite Study Development

Due to the complexity in developing studies to identify offsite movement and source identification, in March 2009, DPR proposed additional data requirements and allowed stakeholders and registrants to provide comments. The proposal would include source identification for both urban and agricultural environments to be developed within certain timeframes. As an outcome of this proposal, DPR and pyrethroid stakeholders are working together to develop a process that will be used to identify possible future data requirements for the pyrethroid reevaluation.

#### **Part 4 – Monitoring in Publicly Owned Treatment Works (POTWs)**

In March 2007, PWG submitted a proposal to address the fate of pyrethroids in POTWs. DPR sent the POTW proposal to key stakeholders for comment. In April 2007, DPR received comments on the proposal from Tri-TAC, a technical advisory committee for POTWs in California. The PWG established a small working group with DPR staff and members of Tri-TAC to exchange information and to jointly develop study protocols. In October 2007, DPR determined that the proposal is likely to provide acceptable information. DPR requested a list of activities and milestones by the last quarter of 2007. In April 2008, the PWG provided a progress report with draft activities and milestones developed in concert with Tri-TAC. In November 2008, the PWG provided DPR with a preliminary study design for POTW monitoring. The objective of the study is to provide water monitoring data for representative POTWs that will give an indication of the potential for pyrethroids to enter water treatment plants and appear in effluent at concentrations that exceed aquatic toxicity criteria. In March 2009, the PWG provided DPR with a draft of a wastewater treatability study entitled, “Laboratory Work Plan to Investigate the Fate of Pyrethroid Insecticides Through Primary Settling, Aerobic and Anaerobic Biological Treatment and Ultrafiltration. In April 2009, DPR reviewed the preliminary study design and determined the sampling regime should accomplish the stated objective. DPR anticipates coordinating review of the preliminary study design with POTWs in the third quarter of 2009. Additionally, DPR anticipates reviewing the wastewater treatability study and assessing the applicability to the reevaluation in the third quarter of 2009.

#### **Additional Information on Pyrethroids**

In April 2008, DPR hosted a meeting with SWRCB, the Central Coast Regional Water Quality Control Board, members of PWG, and Dr. Lenwood Hall from the University of Maryland, to discuss bioassessment as a tool to look at holistic stream health. In July 2008, DPR received two final reports on bioassessment entitled, “An Assessment of Benthic Communities with Concurrent Physical Habitat, Pyrethroid and Metals Analysis in an Urban and Residential Stream in California in 2006 and 2007” and “A Comparison of Sediment Sampling Methods for Pyrethroids in Urban/Residential Sediments of California Streams and

Additional Pyrethroid Sampling in Pleasant Grove Creek Backwater Surrogate Sites.” DPR anticipates providing a review of Dr. Hall’s studies in the fourth quarter of 2009.

In May 2008, PWG submitted a report entitled “Barriers to Adoption of Irrigation Reducing Technologies.” In November 2008, DPR reviewed the final report and determined that the study does not identify sources of off-site movement nor does it demonstrate reduction or elimination of pesticide residues to aquatic sites. Therefore the study is not relevant to the reevaluation of pyrethroids.

In November 2008, DPR met with PWG who has partnered with Allen Strategic, to discuss the development of the Urban Pyrethroid Stewardship program. Through this voluntary program, a Web site, radio advertisements, and additional handout materials will be developed to inform urban pesticide users about protecting California water through the proper use of pesticides. Although the stewardship program does not answer all of the pyrethroid issues, DPR values the efforts put forth by Allen Strategic to inform urban applicators to “Apply Responsibly.” The Urban Pyrethroid Stewardship Web site is: <<http://www.applyresponsibly.org>>.

#### CERTAIN FIELD SOIL FUMIGANT PRODUCTS – 66 Products

Soil fumigants are pesticides which, when applied to soil, form a gas to control pests that live in the soil and can disrupt plant growth and crop production. The fumigants are either volatile chemicals that become gases at relatively low temperatures, around 40 degrees Fahrenheit, or chemicals that react to produce such a gas. On January 18, 2008, DPR initiated a reevaluation of certain pesticide products intended for use in field fumigation and containing one or more of the following active ingredients: methyl bromide, 1,3-dichloropropene, chloropicrin, metam-sodium, metam-potassium, dazomet, and sodium tetrathiocarbonate. The basis for this reevaluation is the same as the TGA data call-in and reformulation reevaluations, to reduce VOCs from fumigant use. Fumigants are among the highest pesticide VOC contributors due to both their high levels of use and high emission potentials. DPR is requiring registrants to conduct and submit ambient or direct flux monitoring studies under a variety of prescribed field fumigation application methods.

In March and again in May 2008, DPR met with registrants and task force members such as AMBI and CMTF to discuss several aspects of the reevaluation. At the first meeting, DPR presented the objectives of the reevaluation: review single active ingredient fumigant monitoring data for each fumigant and application method; investigate the differences among emissions and climates in specified NAAs; and investigate VOC emissions for combination products such as methyl bromide + chloropicrin and 1,3-dichloropropene + chloropicrin. At the second meeting, the following were discussed: modeling options, combining field studies, and scenarios to achieve results in a shorter timeframe due to limited research facilities to

perform the monitoring studies. Subsequent to the May 2008 meeting, DPR requested registrants to submit a statement of intent to comply with the data requirements as a sole entity or through the formation of a task force, and a proposed prioritization scheme for providing the required data. In August 2008, all registrants submitted statements of intent to generate studies and identified a prioritization scheme for development of study protocols to address the data requirements of the reevaluation. DPR anticipates responding to the compliance proposals and prioritization scheme by the fourth quarter of 2009.

CERTAIN SULFURYL FLUORIDE PRODUCTS INTENDED FOR STRUCTURAL FUMIGATION – 3 Products

Sulfuryl fluoride is an insecticide and rodenticide used to fumigate closed structures and their contents such as domestic dwellings, garages, barns, storage buildings, commercial warehouses, ships in port, and railroad cars. Sulfuryl fluoride controls numerous insect pests including termites, powder post beetles, old house borers, bedbugs, carpet beetles, clothes moths, and cockroaches, as well as rats and mice. The end-use products are marketed as a liquid gas in pressurized steel containers.

On June 27, 2008, DPR placed all sulfuryl fluoride products intended for structural fumigation into reevaluation. DPR based its reevaluation on DPR's July 2006 risk assessment of sulfuryl fluoride. In the risk assessment, DPR scientists identified several scenarios where exposure to sulfuryl fluoride is of concern. DPR based the exposure assessment for these scenarios on limited data, using health-protective factors to compensate for data uncertainties. Based on the current exposure assessment, it appears that worker exposure may not be mitigated using currently known mitigation strategies. Current sulfuryl fluoride labels in combination with California regulations require workers to use self-contained breathing apparatus (SCBA) until air levels are confirmed to be below 1 part per million (ppm). However, DPR and the structural pest control industry developed a Tarpaulin Removal Aeration Plan (TRAP) to reduce worker exposure to 5 ppm (the standard on older labels). DPR is concerned that workers removing tarpaulins using the TRAP method may be exposed to sulfuryl fluoride levels above the permissible reentry level of 1 ppm, thereby triggering the requirement to wear SCBA. The worker exposure monitoring data are needed to assess whether the TRAP plan is adequate to reduce fumigation worker sulfuryl fluoride exposures to 1 ppm (the current label standard). DPR also needs monitoring data to develop mitigation methods that will reduce the risks to workers.

Pursuant to the reevaluation data call-in, sulfuryl fluoride registrants are required to submit fumigation worker exposure data (area air monitoring and personal air monitoring) and residential post-application monitoring (instantaneous and continuous air measurements). In August 2008, DPR received written statements from each registrant of their intent to comply with the data requirements as a sole entity or through the formation of a task force. In September 2008, Dow AgroSciences submitted a study entitled, "Sulfuryl Fluoride and



Chloropicrin Concentrations in Air During Fumigation, Aeration and Post Clearance of Residential Structures.” In October 2008, DPR received a proposed protocol from Ensystem II, Inc. and Drexel Chemical Company entitled “Airborne Residues of Sulfuryl Fluoride using the “TRAP” Aeration Method following Structural Fumigation.” Additionally in October 2008, DPR staff met with Dow AgroSciences, who provided an overview of current California fumigation practices; provided the results of aeration monitoring; and an update on neurotoxicity studies as submitted to U.S. EPA. DPR is currently reviewing the submitted study protocols and data. DPR anticipates completing their review by the fourth quarter of 2009.

#### NITROGUANIDINE INSECTICIDE CLASS OF NEONICOTINOIDS – 272 Products

On February 27, 2009, DPR placed certain pesticide products within the nitroguanidine insecticide class of neonicotinoids containing the following active ingredients: imidacloprid, clothianidin, dinotefuran, and thiamethoxam into reevaluation. The reevaluation is based on an adverse effects disclosure regarding the active ingredient imidacloprid. The disclosure included twelve residue and two combination residue, honey, bumble bee studies of imidacloprid use on a number of ornamental plants. DPR’s evaluation of the data noted two critical findings. One, high levels of imidacloprid in leaves and blossoms of treated plants, and two, increases in residue levels over time.

Imidacloprid levels in leaves and blossoms varied depending on the application rate and the type of plant, but the data indicate that residues in some plants measured higher than four parts per million (ppm). The data also indicate that when using soil application methods, imidacloprid residues remained relatively low for the first six months after application, followed by a dramatic increase that remained stable in some cases for more than 500 days after treatment. Where imidacloprid was applied to the soil, no significant decline in residues levels was observed in any of the studies, even in studies where residues were tested at 540 days after treatment. DPR found that the treatment rates used in the studies were high imidacloprid residue levels were found in leaves and blossoms, were comparable to application rates found on currently registered labels for orchards, assuming the orchards were planted at a density of 200 trees per acre or fewer. The data indicate that use of imidacloprid on an annual basis may be additive, in that significant residues from the previous use season appear to be available to the treated plant.

Imidacloprid is a relatively new, systemic insecticide. It has a wide range of uses: in agriculture, on turf, on pets, and for household pests. DPR excluded the following formulation categories and product types from this reevaluation: products formulated as a gel or impregnated in a strip; termiticides; flea control products combined with rodenticide; pet spot on applications; ant and roach baits; premise application for control of nuisance pests; or, manufacturing use only products. DPR exempted the above types of products from the reevaluation because the manner in which the products are formulated or applied makes it

unlikely that the neonicotinoid will move into plants that bloom or be a source of forage for honey bees and pollinators.

At this time, the data requirements of the reevaluation have not been identified. However, DPR intends to require field-based data on neonicotinoids in order to better understand their impact on honey bees. In addition, DPR plans to work closely with U.S. EPA's Office of Pesticide Programs (OPP) and Pest Management Regulatory Agency (PMRA) Health Canada throughout this reevaluation process. On April 1, 2009, DPR staff met with registrants and provided an opportunity to comment on DPR's proposed data requirements. Additionally, U.S. EPA's OPP and PMRA attended via conference call. DPR will consider comments received and consult with U.S. EPA's OPP and PMRA in developing the final data requirements. DPR plans to require registrants to analyze residues from nectar and pollen of a representative number of crops grown in California. In addition, DPR plans to require acute [laboratory] toxicity studies on various honey bee life stages. DPR anticipates announcing its final data requirements by the third quarter of 2009.

## **II. PRELIMINARY INVESTIGATIONS (EVALUATIONS)**

DPR conducts preliminary investigations of products for which DPR or other State or county agencies have identified possible hazards. As a result of evaluation, the investigations may lead to formal reevaluation.

Activities of the copper-based antifouling paint (AFP), which was recently renamed the antifouling strategy workgroup, and statewide monitoring of AFP active ingredients are ongoing. These efforts will allow DPR to determine whether AFPs, particularly those that contain copper, should be placed into reevaluation.

Endosulfan is a broad spectrum contact insecticide and acaricide registered for use on a wide variety of vegetables, fruits, cereal grains, and cotton, as well as ornamental shrubs, trees, vines, and ornamentals for use in commercial agricultural settings. DPR is investigating recent research suggesting that endosulfan may adversely effect amphibian populations in the Sierra Nevada and Coastal Range of California to determine whether to place currently registered pesticide products containing the active ingredient endosulfan into reevaluation.

For more information, please contact Ms. Denise Alder, Program Specialist in the Pesticide Registration Branch, by e-mail at <dalder@cdpr.ca.gov> or by telephone at (916) 324-3522.

*David Supkoff for*

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*October 19, 2009*

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Date

cc: Ms. Denise Alder