



California Notice 2012-09

SEMIANNUAL REPORT SUMMARIZING THE REEVALUATION STATUS OF PESTICIDE PRODUCTS DURING THE PERIOD OF January 1, 2012 THROUGH June 30, 2012

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 and 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, which 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 (page 16).

I. FORMAL REEVALUATION

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

ANTIFOULING PAINT PESTICIDES (COPPER-BASED) – 203 Products

On June 1, 2010, DPR placed into reevaluation certain pesticide products containing the active ingredients copper oxide, copper hydroxide, and cuprous thiocyanate used as antifouling paint (AFP) pesticides. DPR initiated this reevaluation based on findings from a June 2009 DPR report titled, *Monitoring for Indicators of Antifouling Paint Pollution in California Marinas*. The report found that dissolved copper concentrations in more than half the water samples taken from salt and brackish water marinas exceeded the California Toxics Rule (CTR) chronic water quality standard, as well as the acute standard in about a third of these water samples.

The DPR study indicated that copper was the likely cause of the toxicity. California Regional Water Quality Control Boards' (RWQCB) water quality control plans require that all waters be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Dissolved copper concentrations were found to violate RWQCBs' water quality objectives for toxicity. DPR's report found that copper AFPs applied to boat hulls are likely a major source of dissolved copper in salt and brackish water marinas, particularly during dry weather periods. DPR concluded that the main pathways of copper contamination appear to be passive leaching of AFP-painted boat hulls and underwater boat hull cleaning.

Pursuant to this reevaluation, DPR required registrants of copper-based AFPs to submit: (1) information identifying the paint type (e.g., soft sloughing, epoxy ester conventional, etc.); (2) data characterizing the products' copper leach rate; (3) specific mitigation strategies on pesticide use or reformulation that will reduce dissolved copper concentrations in California salt and brackish water marinas to levels below CTR or regionally applicable standards demonstrating effectiveness; and (4) marina monitoring data to determine compliance with CTR standards after mitigation strategies have been implemented. In March of 2011, copper AFP registrants were notified of an additional data requirement intended to determine the impact of underwater hull cleaning activities on copper concentrations in California marinas.

DPR has reviewed leach rate and paint type information for all AFP pesticide products registered in California. Based on information provided, most copper-based AFPs are either copolymer ablative or epoxy ester types. In September of 2011, the American Coating Association-

Antifouling Working Group (ACA-AWG) submitted an underwater hull cleaning study concept. DPR provided comments and recommendations. In June of 2012, DPR approved ACA-AWG's revised Underwater Hull Cleaning Study Protocol. DPR anticipates results from this study by the first quarter of 2013.

BRODIFACOUM (SECOND-GENERATION RODENTICIDES) – 24 Products

On December 30, 1999, at the request of the Department of Fish and Game (DFG), DPR placed pesticide products containing the active ingredient brodifacoum, a second-generation anticoagulant rodenticide, into reevaluation. DFG expressed concern that California's wildlife are exposed and may be adversely affected by currently registered uses of brodifacoum. This second-generation rodenticide delivers a delayed lethal dose to the target rodent with its first feeding; however, the rodent does not die immediately. After multiple feedings a rodent may have a significant "body burden" of this persistent pesticide at death, leading to its implication in non-target wildlife exposures. Given the increased public interest in wildlife issues associated with brodifacoum, DPR began taking steps to address the problems associated with the use of brodifacoum, and two other second-generation anticoagulants, difethialone and bromadiolone.

In the fall of 2005, DPR presented an issue paper recommending a number of mitigation measures and proposed that rodenticide baits containing brodifacoum, bromadiolone, and difethialone be restricted to indoor structural use only. However, based on comments from representatives of the pest control industry expressing concern over the restriction, DPR reconsidered its proposal. In May of 2008, U.S. EPA announced its final *Risk Mitigation Decision for Ten Rodenticides* and enacted mitigation measures. In the final RMD, the ten rodenticides are grouped into first and second-generation anticoagulants and non-anticoagulants. First-generation anticoagulants include chlorophacinone, diphacinone, and warfarin, and second-generation anticoagulants include brodifacoum, bromadiolone, difethialone, and difenacoum. Non-anticoagulants include zinc phosphide, bromethalin, and cholecalciferol. To minimize children's exposure to rodenticide products used in homes, U.S. EPA asked that all first-generation and non-anticoagulant rodenticide products marketed to residential consumers be sold as solid formulations preloaded in bait stations. To reduce wildlife exposures and ecological risks, U.S. EPA restricted sale and distribution with the intention of minimizing availability of second-generation anticoagulant products to residential consumers. U.S. EPA also restricted all outdoor, above-ground use of second generation anticoagulants to use in bait stations. However, U.S. EPA allowed continued sale of larger size quantities of second generation rodenticides at farm type stores.

While many companies that produce rodenticide products agreed to adopt the new federal safety measures, a handful of companies did not. As a result, U.S. EPA issued a *Draft Notice of Intent to Cancel and Notice of Denial Certain Rodenticide Bait Products* on November 2, 2011. In the draft notice, US EPA identified 20 federally registered products as subject to federal cancellation. Eight of the products are currently registered with DPR. DPR is monitoring the

progress of the US EPA cancellation process. Additionally, DFG requested that DPR designate second-generation anticoagulant rodenticides as California restricted materials. DPR is in the process of reviewing this request and assessing wildlife incident data recently submitted by DFG and other rehabilitation organizations. DPR intends to complete an analysis paper on second-generation rodenticides by the fourth quarter of 2012, and move forward with the reevaluation process by monitoring US EPA efforts and determining if additional mitigation measures (i.e., making these products California restricted materials) are necessary to address the reported concerns.

CHLOROPICRIN – 42 Products

In October of 2001, DPR initiated the reevaluation of the active ingredient chloropicrin based on data submitted under the Birth Defect Prevention Act (BDPA) that indicate it has the potential to cause adverse health effects at low doses. The National Institute for Occupational Safety & 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, 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 of 2005 and advanced its work on a chloropicrin risk characterization document (RCD). In February of 2010, DPR completed its RCD for chloropicrin as a toxic air contaminant (TAC) and an assessment of risks associated with potential exposures to residents and bystanders from ambient and off-site air concentrations of agricultural use chloropicrin pesticides products. DPR found that the use of chloropicrin products for agricultural soil fumigation applications results in unacceptable acute, seasonal, and chronic exposures to residents and bystanders. A risk management directive was issued in December 2010. Based on the RCD and the recommendation of the Scientific Review Panel (SRP), DPR designated chloropicrin as a TAC effective January 8, 2011.

DPR's comprehensive RCD, which includes dietary and occupational exposure scenarios, is still under development. On December 29, 2011, it was submitted to Office of Environmental Health Hazard Assessment and U.S. EPA for external peer review. DPR is still waiting for comments. DPR will determine which occupational exposures require risk mitigation through another risk management directive after completion of the comprehensive RCD. In the meantime, DPR will continue to develop mitigation measures in consultation with the Air Resources Board, the air pollution districts, and the County Agricultural Commissioners, as required by Food and Agricultural Code section 14024(a) to protect public health concerns for residents and bystanders. DPR will defer concluding the reevaluation until the comprehensive RCD is completed or adequate mitigation measures are implemented.

CHLORPYRIFOS – 33 Products

On March 11, 2004, DPR placed all agricultural use (including turf use) products containing chlorpyrifos into reevaluation based on monitoring data collected by the Central Valley Regional Water Quality Control Board (CVRWQCB). The data revealed that chlorpyrifos levels exceeded water quality criteria (WQC) for aquatic invertebrates in the rivers and tributaries of the San Joaquin (SJ) Valley, the Sacramento/ SJ Delta, and Monterey County. These detections of chlorpyrifos have resulted in the development of an organophosphate pesticide total maximum daily load (TMDL) in identified segments of the SJ River and Sacramento/ SJ Delta.

Pursuant to this reevaluation, DPR required chlorpyrifos registrants to do the following: (1) identify the process by which chlorpyrifos pesticides are contributing to detections in surface water at levels that exceed WQC; and (2) identify mitigation strategies that have been shown to reduce or eliminate chlorpyrifos residues in surface water. The basic manufacturer responded with the submission of data and information, and identified mitigation measures intended to reduce chlorpyrifos residues in surface water when the products are used under California conditions. DPR reviewed and agreed with the basic manufacturer's assessment of the modes of transport of chlorpyrifos residues to surface water.

In April 2008, the basic manufacturer submitted a final report titled, *Surface Water Monitoring and Use Investigations for Determining Effectiveness of Chlorpyrifos Mitigation Measures – 2007 Final Report*. DPR scientists' reviewed the report and found that the monitoring data indicate that chlorpyrifos continues to be detected at levels that exceed WQC at most sites considered in the report. In addition, DPR scientists determined that exceedances occur throughout the year and appear to result from numerous crops and application methods. In May 2009, the basic manufacturer submitted a report titled, *Historical Trend Analysis and Field Investigations of Chlorpyrifos Exceedances in Surface Water*. DPR scientists' determined that the submitted data and field investigations show the following: (1) chlorpyrifos continues to be detected in surface water at levels that exceed water quality thresholds; (2) exceedances occur at multiple sites in the SJ, Santa Maria, and Salinas River watersheds; (3) multiple crops and agricultural practices potentially contribute to the off-site movement of chlorpyrifos; and (4) both applications made in accordance with, and in violation of, label requirements potentially contribute to off-site movement of chlorpyrifos.

As a result, DPR required the basic manufacturer to provide a summary of all relevant recent (2004-2010) surface water monitoring data to assess if current mitigation measures are adequate to prevent chlorpyrifos exceedances of WQC. In August of 2011, they submitted a report titled, *Surface Water Monitoring Results and Historical Trend Analysis of Chlorpyrifos in Surface Water 2004-2010*, which DPR completed review of in March of 2012. In April of 2012, DPR completed an analysis memo titled, *Analysis of Chlorpyrifos Agricultural Use in Regions of Frequent Surface Water Detections in California, USA*, and is in the process of determining the next steps of the reevaluation and evaluating possible mitigation strategies.

CYFLUTHRIN – 38 Products

In May of 1998, DPR placed the active ingredient cyfluthrin into reevaluation based on its investigations 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, DPR's Worker Health & 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 normal working environment, something different in the work environment led to the workers' respiratory irritation symptoms experienced. DPR compiled the results in its monitoring study titled, *Health and Safety Report, HS – 1765*.

In October of 2001, the basic manufacturer submitted the following: two worker exposure studies regarding hand harvesting of oranges and sweet corn; four indoor exposures studies; and a study titled, *Study on the RD₅₀ 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; therefore, DPR required a sweet corn worker exposure study. The results of the study were submitted to DPR in October 2004. In September of 2008, DPR presented an exposure scoping document for cyfluthrin intended to lay the groundwork for the risk assessment process. All of the submitted data and relevant information will be used in the pending final risk assessment of cyfluthrin.

DIAZINON – 4 Products

On February 19, 2003, 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, CVRWQCB, State Water Resources Control Board (SWRCB), and DPR. These studies reported 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.

Pursuant to this reevaluation, diazinon registrants developed supplemental labeling for dormant spray products to mitigate off-site movement of diazinon residues and were required to conduct monitoring studies to confirm the effectiveness of the strategies. In February of 2007, DPR received a report prepared by UC Davis titled, *Residues of the 2006 TMDL Monitoring of Pesticides in California's Central Valley Waterways, January – March 2006*. This study documented diazinon concentrations measured during the 2006 dormant spray season were still exceeding WQC. DPR forwarded the UCD study to the registrants and requested development and implementation of further mitigation measures to reduce or eliminate diazinon residues in surface water. In February of 2008, DPR decided that recent monitoring data needed to be evaluated to determine the relationship between diazinon use and exceedances of the WQC. The basic manufacturer submitted two reports titled, *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 basic manufacturer submitted another report titled, *Analysis of Diazinon Environmental Monitoring Data from the San Joaquin River Watershed: 2001 – 2007.*

On June 22, 2010, the Director expanded the reevaluation based upon an analysis of DPR's 2003 – 2008 monitoring data. The analysis revealed 637 diazinon detections out of 2,635 samples from water bodies located in the Central Valley, Central Coast, and Southeastern California. As a result, in addition to the monitoring data provided for the dormant spray season, DPR requested the registrants to do the following: (1) collect and evaluate all relevant (2005-2009) surface water monitoring data to determine if application of diazinon to specific irrigated fields is resulting in exceedances of WQC; and (2) establish crop-specific mitigation measures based upon results of submitted monitoring data. In March of 2011, the basic manufacturer submitted a combined monitoring report for both the required dormant season and in-season monitoring study titled, *Summary of Diazinon Water Column Monitoring Data for Nine California Regions: 2005-2010*, which DPR found to be acceptable. DPR completed an analysis memo titled, *Analysis of Diazinon Agricultural Use in Regions of Frequent Surface Water Detections* and is in the process of determining the next steps of the reevaluation and evaluating possible mitigation strategies.

EMISSION POTENTIAL DATA (VOC DATA CALL-IN) – 372 Products

On February 16, 2005, DPR placed certain liquid formulation agricultural and commercial structural-use pesticide products in reevaluation based on concern over release of volatile organic compounds (VOCs) into the atmosphere from these products. Many pesticide active ingredients and inert ingredients are VOCs and react in the presence of sunlight to create ground-level ozone.

The U.S. Clean Air Act (CAA) 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 non-attainment area (NAA). In 1994, to address several California air quality control regions that do not meet NAAQS for ozone, the California Air Resources Board (ARB) submitted a SIP to the U.S. EPA that included a pesticide element (Pesticide SIP). 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. To implement the 1994 SIP, DPR placed all agricultural and commercial structural-use pesticides formulated as liquids into reevaluation.

DPR calculates the estimated annual VOC emission totals for these pesticide products using VOC emission potential (EP) data and DPR's Pesticide Use Report (PUR) data. Under the reevaluation, DPR gave registrants the option of calculating the VOC EP of a pesticide product using water and/ or inorganic subtraction, instead of submitting thermogravimetric analysis

(TGA) data. A few registrants of new pesticide products submitted TGA data; however, the majority of registrants did not, and DPR had to assign default EP values to many new pesticide products. This meant that due to the default emission assignments, DPR's calculations of total VOC emission from pesticide products were only approximate.

Pursuant to this reevaluation, DPR required the identified registrants to submit TGA data or appropriate information. At initiation, the reevaluation included 787 pesticide products and 218 registrants. As of June 2012, 372 of these products are still registered to 131 registrants. Pursuant to this reevaluation, registrants conducted and submitted EP data using the TGA protocol supplied by DPR. Of the 372 registered products, DPR has on file acceptable TGA data or other information to satisfy the reevaluation requirement. Therefore, on June 14, 2012, DPR concluded this reevaluation (California Notice 2012-06).

FIELD SOIL FUMIGANT PRODUCTS – 62 Products

In January of 2008, DPR initiated a reevaluation of certain pesticide products intended for use as field soil fumigants and containing one or more of the following active ingredients: methyl bromide, 1,3-dichloropropene, chloropicrin, metam-sodium, metam-potassium, dazomet, and sodium tetrathiocarbonate. Fumigants are among the highest pesticide VOC contributors due to both their high levels of use and high emission potentials. The basis for this reevaluation is the same as the TGA data call-in and reformulation reevaluations, to reduce VOCs from pesticide products. DPR is requiring registrants to conduct and submit ambient or direct flux monitoring studies under a variety of prescribed field fumigation application methods.

DPR met with registrants and task force members such as Alliance of Methyl Bromide Industry (AMBI) and Chloropicrin Manufacturers Task Force (CMTF) to discuss several aspects of the reevaluation. DPR presented three objectives of the reevaluation to registrants and task force members: (1) review single-active ingredient monitoring data for each fumigant and application method; (2) investigate the difference among emissions and climates in specified NAAs; and (3) investigate VOC emissions for combination products such as methyl bromide + chloropicrin and 1,3-dichloropropene + chloropicrin. In a subsequent meeting, attendees discussed options for conducting computer modeling in lieu of field monitoring studies, combining field studies, and scenarios to achieve results in a shorter timeframe due to limited research facilities to perform the field studies.

Pursuant to this reevaluation, DPR has completed review of several monitoring studies under a variety of prescribed field fumigant application methods submitted by registrants and task force members. DPR reviewed CMTF's submitted final reports titled, *Direct Flux Determination of Chloropicrin Emissions from Shank, Bedded, Non-Tarped Applications* and *Monitoring 1,3-Dichloropropene, Chloropicrin, and Methyl Isothiocyanate Emissions from Shank Applications at three sites near Duette, Florida*. In June of 2012, DPR completed review of the study titled,

Soil Fumigant Emissions Reduction using EVAL barrier film and Evaluation of Tarping Duration needed to minimize fumigant total mass loss for 1,3-D and Chloropicrin.

On April 2, 2012 the only sodium tetrathiocarbonate product registered in California was voluntarily cancelled. DPR is working to modify and verify the computer model HYDRUS for use in determining any needed flux data for current and new fumigant application methods and determine the next steps of the reevaluation.

NITROGUANIDINE INSECTICIDE CLASS OF NEONICOTINOIDS – 292 Products

On February 27, 2009, DPR placed certain pesticide products within the nitroguanidine insecticide class of neonicotinoids containing the active ingredients imidacloprid, clothianidin, dinotefuran, and thiamethoxam into reevaluation. This reevaluation is based on an adverse effects disclosure regarding the active ingredient imidacloprid. The disclosure included twelve ornamental plant residue studies, and two combination, residue, honey, and bumble bee studies of imidacloprid use on a number of ornamental plants. DPR's evaluation of the data noted two critical findings: (1) high levels of imidacloprid in leaves and in blossoms of treated plants, and (2) increases in residue levels over time. 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 systemic insecticide that has a wide range of uses: in agriculture, on turf, on pets, and for household pests. Thiamethoxam, dinotefuran and clothianidin are in the same chemical family as imidacloprid, and have similar characteristics, soil mobility and half-lives, and toxicity to honeybees.

In September of 2009, DPR notified registrants of the data requirements, which include field-based residue analysis in pollen and nectar from specific agricultural orchard and row crops for each of the four active ingredients, and an LC₅₀ study on honey bees starting at the larval stage through emergence. To determine the crops of focus for the data requirements, DPR utilized its PUR database.

Imidacloprid: In 2009, the registrant submitted information and existing data to address DPR's reevaluation data requirements for field data on almonds, citrus, cotton, cucurbits (melons), fruiting vegetables (tomatoes), pome fruit, and strawberries. Rather than conducting a monitoring study in almonds, imidacloprid registrants chose instead to remove use on almonds from their labels. In April 2010, the registrant submitted draft study protocols for monitoring studies in cotton, melons, tomatoes, pome fruit, and strawberries. The draft protocols were reviewed by DPR, U.S. EPA, and Pest Management Regulatory Agency (PMRA) Health Canada. In May 2011, DPR received final reports from monitoring studies conducted in citrus (light and medium soil), cotton and tomato. In March of 2012, DPR provided a review of the submitted reports and found both the cotton and tomato studies to be unacceptable because they did not represent a worst-case scenario. Subsequently, DPR required new two-year prescriptive residue monitoring studies, representing a worst-case scenario, for fruiting vegetables, cotton and newly added crop

group stone fruit. On March 21, 2012, DPR received a final study for acute toxicity effects in honeybee larva that is under review. In April 2012, the registrant submitted a final report on citrus titled, *Summary of key findings and conclusions of investigations to evaluate bee exposure levels at Southern California citrus groves previously treated with imidacloprid*. In May of 2012, DPR received protocols for cotton, tomato and stone fruit (cherry) that are currently under review. Pome fruit, strawberry, and cucurbits final reports are anticipated in the fourth quarter of 2012.

Thiamethoxam: DPR requested field data on cucurbits, fruiting vegetables, pome fruit and strawberries of thiamethoxam registrants. Draft protocols for residue monitoring studies in cucurbits (melons), fruiting vegetables (tomatoes), and pome fruit were received and reviewed by DPR, U.S. EPA, and PMRA. In March 2011, the registrant requested a waiver from the requirement to monitor pome and strawberries due to the limited field applications of thiamethoxam in 2009 and 2010. DPR is considering alternative row and orchard crops for its reevaluation data call in. In June, the basic manufacturer submitted final reports for tomatoes and acute toxicity to larval honey bees that are under review. A final report on cucurbits is anticipated by the first quarter of 2013.

Dinotefuran: In November 2009, the dinotefuran registrant submitted information about the environmental fate and behavior of their products as well as existing data they felt satisfied the reevaluation data requirements in lieu of the requested study protocols. In March 2011, the registrant submitted a final report investigating foraging honeybees and hives after exposure to dinotefuran applied to cotton that DPR anticipates completing its evaluation of by the fourth quarter of 2012. In March of 2012, the basic manufacturer submitted additional cotton field data and acute toxicity to larva data that are pending review.

Clothianidin: In 2009, the clothianidin registrant documented limited use in California and its inability to perform the monitoring field studies requested under the reevaluation. Instead, the registrant proposed to conduct small-scale studies, analogues to magnitude-of-residues studies, on cucurbit. In January and April of 2011, the registrant submitted an acute toxicity study protocol, and a draft protocol for conducting pollen and nectar residue sampling in cucurbits. In February of 2012, the registrant submitted an acute toxicity to larval honey bees that is under review. In May of 2012, the registrant submitted a more robust protocol on cucurbits (pumpkins) that is pending review.

PYRETHROIDS – 605 Products

In August of 2006, DPR placed certain pesticide products containing pyrethroids into reevaluation. The reevaluation is based on monitoring surveys and toxicity studies revealing the widespread presence of synthetic pyrethroid residues in the sediment of California waterways dominated by both agricultural and urban runoff, at levels toxic to *Hyaella azteca* (*H. azteca*). Scientist commonly use *H. azteca*, an aquatic crustacean found in some Central Valley water

bodies, as an indicator of environmental health and water quality in streams, lakes, and other water bodies. Significant toxicity was observed at numerous sites and 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 a synthetic class of insecticides. DPR did not include pesticide products containing pyrethrins, a naturally occurring insecticide found in *Chrysanthemum cinerariaefolium*, in this reevaluation because pyrethrins are known to breakdown rapidly in the environment. Additionally, DPR excluded certain product types from this reevaluation, such as pressurized liquids and impregnated materials, because it is unlikely that the pyrethroids in these types of products will move into surface waters or sediments.

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 second (Group II) and third groups (Group III) consist of the newer second-generation pyrethroids, most of which are “Type II” pyrethroids. The more toxic Group II and Group III pyrethroids are less photosensitive and persist longer in the environment. The two active ingredients identified as belonging in Group II have not been detected (or monitored for) in California aquatic sediments. Group III pyrethroids have been detected in aquatic sediments, and both Group II and III pyrethroids are widely used in both agricultural and urban settings.

Pursuant to this reevaluation, registrants with products containing active ingredients in Group I are required to submit certain environmental fate data. Registrants with products in Group II are required to submit sediment persistence and ecotoxicology data, and monitoring in areas appropriate to use patterns. Registrants with products in Group III are required to submit the following: (1) certain environmental fate data; (2) sediment persistence and ecotoxicology data; and (3) transport mechanisms and mitigation data. In addition, registrants with products containing permethrin are required to conduct monitoring in Publicly Owned Treatment Works (POTWs).

Group I Active Ingredients

The active ingredients that fall into this group are bioallethrin, d-allethrin, imiprothrin, phenothrin, prallethrin, resmethrin, and tetramethrin. Typically these pyrethroids are used indoors and around residential areas. DPR has completed its review of environmental fate data submitted for Group I pyrethroids, with the exception of a photolysis study for imiprothrin. These data are important to understanding the nature of these chemicals and will contribute to the comprehensive characterization of pyrethroids.

Group II Active Ingredients

The active ingredients that fall into this group are tau-fluvalinate and tralomethrin. Based on a commitment by registrants of Group II products to implement the same mitigation measures developed for Group III products with similar use, DPR determined that additional studies are not required at this time.

Group III Active Ingredients

The active ingredients that fall into this group are (S)-cypermethrin, beta-cyfluthrin, bifenthrin, cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, fenpropathrin, gamma-cyhalothrin, lambda-cyhalothrin, and permethrin.

Part 1 – Environmental Fate Data

DPR has completed its review of environmental fate data provided for the requested Group III pyrethroids. The Department will use these data in its comprehensive characterization of pyrethroids for this reevaluation.

Part 2 – Sediment Persistence and Ecotoxicology Data

In June of 2007, DPR found that the sediment analytical method studies submitted by the Pyrethroid Working Group (PWG) to be adequate to satisfy the DPR's analytical method data requirement for all Group III pyrethroids in sediment. Revised 10-day acute sediment toxicity tests with *H. azteca* and *Chironomus dilutus* (*C. spp*), and cold temperature studies were reviewed and found to be acceptable. DPR deferred the 42-day *H. azteca* chronic studies until U.S. EPA's Office of Chemical Safety and Pollution Prevention (OCSPP) finalizes the 850 series test guidelines addressing whole sediment life cycle toxicity tests for *H. azteca* and *C. spp*. In May of 2010, DPR received an aerobic/anaerobic California sediment half-lives progress report in lieu of the final report, documenting challenges experienced with the method. PWG has committed to conduct the study using the previous protocol, an improved analytical method, and recently issued U.S. EPA study guidelines. On August 25, 2011, PWG submitted a draft pyrethroid sediment toxicity testing proposal. In June of 2012, PWG submitted a final aquatic aerobic/anaerobic sediment half-lives study that is pending review.

Part 3 – Transport Mechanisms and Mitigation

Development of Monitoring Plans in Areas Appropriate to Use Pattern – In July 2007, PWG submitted an overall plan to address transport mechanisms and mitigation in agricultural and urban settings, and explained how the study proposals address off-site movement of pyrethroid residues.

In January and April 2009, PWG submitted final reports from their investigation of building materials and turf. The objectives of these studies were to (1) identify the most important above-ground building material scenarios for potential future best management practices (BMP) studies; and (2) compare runoff losses from grass irrigated under BMP

to reduce runoff losses from excessive lawn irrigation. On June 4, 2009, U.S. EPA notified registrants of required label changes to address environmental hazards and general labeling for pyrethroid non-agricultural outdoor products.

Identification of Off-site Movement – Due to the complexity of developing studies to identify off-site movement and source identification, DPR proposed additional data requirements and allowed stakeholders and registrants to provide comments. After considering the provided comments, DPR finalized its decision to require additional studies investigating off-site movement of pyrethroids specific to urban uses. Source identification for agricultural settings will be addressed thereafter.

In November 2009, DPR required Group III pyrethroid registrants to develop an urban pathway conceptual model and conduct a survey of pest control businesses. In February 2010, DPR found the pest control business survey adequate to gather information regarding pyrethroid use in urban areas required as part of the reevaluation. In December 2010, PWG submitted a final report titled, *California 2009 Urban Pesticide Use Pattern Study*. DPR's review of the submitted study found several conclusions of interest that could contribute to mitigation measures targeting outdoor perimeter treatment. In September of 2010, PWG submitted a report titled, *Pathway ID Study Protocol*, which received feedback from DPR and stakeholders. On June 15, 2011, PWG submitted a revised report titled, *Pathway ID Study Protocol* that was approved by DPR. In late May of 2012, DPR received an interim report on the *Pathway ID Study*. DPR anticipates results by the fourth quarter of 2012.

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

In March 2007, PWG submitted a proposal to address the fate of permethrin in POTWs. DPR sent the 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. PWG established a small working group with DPR staff and members of Tri-TAC to exchange information and to jointly develop study protocols. In April 2008, PWG provided a progress report with draft activities and milestones developed in coordination with Tri-TAC. In November 2008, PWG provided DPR with a preliminary study design for POTW monitoring. In April 2009, DPR reviewed the preliminary POTW monitoring study design and determined that the sampling regime should accomplish the stated objective. In July 2009, DPR coordinated review of PWG's preliminary study design with Tri-TAC. In October 2009, Tri-TAC provided comments supporting DPR in requesting a final POTW monitoring study protocol from PWG. In January 2011, PWG submitted a draft protocol and analytical methods for monitoring eight Group III pyrethroids titled, *Baseline monitoring program of representative POTW facilities in California 2011-2012*.

On July 15, 2011 DPR notified registrants of products containing the active ingredients beta-cyfluthrin, bifenthrin, cyfluthrin, (S)-cypermethrin, deltamethrin, esfenvalerate, fenpropathrin, gamma-cyhalothrin, lambda-cyhalothrin, and permethrin of inclusion in the POTW monitoring data requirements. Additionally, in the second quarter of 2012, PWG submitted a revised Quality Assurance Project Plan for monitoring influent, effluent, and biosolids. DPR anticipates results in the first quarter of 2013.

On June 19, 2012, the Office of Administrative Law approved regulations identifying 17 pyrethroids as having a high potential to contaminate surface water in outdoor nonagricultural settings, and requiring pest control businesses, including maintenance gardeners that apply these pesticides to take actions to minimize off-site movement from hard non-porous surfaces. The regulations will go into effect in July of 2012.

REFORMULATION VOC REEVALUATION – 376 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 emission potential data reevaluation listed in the previous section. However, the purpose of this reevaluation is different as it examines VOC contribution due to a pesticide product's formulation. Fumigants and liquid pesticide products make up most of the San Joaquin Valley (SJV) pesticide VOC emission inventory. Pesticide reformulation is a mitigating strategy to reduce pesticide VOC emissions. Although fumigant products comprise a substantial portion of the SJV VOC emission inventory, fumigants are not amenable to reformulation because the active ingredient itself is the main source of VOCs and comprises a high percentage of the product. Liquid products, particularly those formulated as emulsifiable concentrates, are significant contributors to the pesticide VOC inventory.

In February of 2010, DPR notified all registrants in the reformulation reevaluation that DPR's review of their response is complete. DPR determined that the best way to reduce VOC emissions from non-fumigants is to concentrate on those products that contribute the most VOCs during the ozone season in the three NAAs (SJV, Southeast Desert, and Ventura). Therefore, DPR narrowed the reformulation reevaluation to focus on the following seven active ingredients: abamectin, chlorpyrifos, dimethoate, gibberellins, oxyfluorfen, permethrin, and trifluralin. DPR required registrants to submit thermogravimetric (TGA) data on each product containing one of these active ingredients or appropriate information for exclusion from the requirement.

In March of 2012, DPR met with registrants of abamectin, chlorpyrifos, gibberellins, and oxyfluorfen pesticide products to discuss proposed non-fumigant regulations for the SJV during the May through October season. Non-fumigant regulations are under review with further information anticipated by the third quarter of 2012. DPR will continue to work with various stakeholders to ensure maintenance and reduction of VOC emissions in the SJV.

SULFURYL FLUORIDE PRODUCTS (STRUCTURAL FUMIGATION) – 3 Products

On June 27, 2008, DPR placed all sulfuryl fluoride (SF) products intended for structural fumigation into reevaluation, based on its July 2006 risk assessment of SF. In the risk assessment, DPR scientists identified several scenarios where exposures to SF are of concern. DPR based the exposure assessment for these scenarios on limited data, using health-protective factors to compensate for the lack of data. Based on the current exposure assessment, it appears that worker exposure may not be mitigated using current mitigation strategies. DPR is concerned that workers using the Tarpaulin Removal Aeration Plan (TRAP) may be exposed to SF levels above the permissible reentry level of 1 ppm, thereby triggering the requirement to wear self-contained breathing apparatus (SCBA). Worker-exposure monitoring data are needed to assess whether the TRAP plan is adequate to reduce fumigation worker SF 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 this reevaluation, SF 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 October 2009, DPR announced that in addition to monitoring data from the fumigation of a single-story single family residence, monitoring data are also needed involving multiple-story multiple dwelling units (i.e., condominiums, town houses, apartment complexes.) In February of 2010, DPR received a revised study protocol for both the single and multiple story structures.

Before the registrant could initiate the monitoring study, DPR announced another data requirement on June 14, 2010. SF product labels require the use of chloropicrin, a toxic gas that causes eye and respiratory irritation at low levels, as a warning agent when fumigating homes. DPR is requiring registrants to monitor for both SF and chloropicrin in single and multiple story, multiple dwelling residences. In June 2010, one registrant submitted an existing residential and multi-unit structure SF and chloropicrin monitoring study. In April 2011, a revised study protocol to include monitoring of chloropicrin was submitted by the other registrant, which DPR has approved and anticipates results from in the first quarter of 2013.

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. However, no preliminary investigations have been initiated at this time.

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

Original signed by

September 5, 2012

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