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SEMIANNUAL REPORT SUMMARIZING THE REEVALUATION STATUS OF PESTICIDE PRODUCTS DURING THE PERIOD OF January 1, 2010 THROUGH June 30, 2010

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 20).

I. FORMAL REEVALUATION

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

BRODIFACOUM – 26 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 its 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. U.S. EPA has been working with rodenticide manufacturers and expects that a variety of mitigation-compliant products will be on the market by the middle of 2011. 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 Chloropicrin Manufacturers Task Force responded to

DPR's comments and questions regarding the studies. On December 5, 2009, DPR submitted a component of the chloropicrin risk assessment to the Scientific Review Panel (SRP) for listing as a Toxic Air Contaminant (TAC). All of the data and information collected in the reevaluation will be used in the complete risk assessment of chloropicrin, which DPR anticipates submitting for external peer review in the fourth quarter of 2010.

CHLORPYRIFOS – 33 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 were 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 2010.

CYFLUTHRIN – 41 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 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, 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 determined that recent monitoring data needed 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.”

On June 22, 2010, the Director expanded the current 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 (Sacramento Valley, San Joaquin Valley, and Tulare), several areas along the Central Coast (including Salinas Valley, Pajaro, and Santa Maria) and southeastern California (Imperial Valley). Diazinon use in these regions accounted for approximately 90 percent of all agricultural-use diazinon applied statewide. Diazinon was primarily used on lettuce, stone fruit trees, spinach, broccoli, cauliflower, corn, melons, and tomatoes. In addition to the monitoring data provided during the dormant spray season, DPR is requesting the registrants (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 water quality objectives, and (2) establish crop specific mitigation measures based upon results of submitted monitoring data. DPR anticipates receiving this information in the first quarter of 2011.

CERTAIN AGRICULTURAL AND COMMERCIAL STRUCTURAL USE LIQUID FORMULATION PESTICIDE PRODUCTS (DATA CALL-IN) – 435 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). 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.

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 2010, 435 of the original 787 products placed into reevaluation remained actively registered in California. Registrants submitted TGA data for 314 products. DPR identified 83 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 completed its reviews of TGA data and evaluation of

requests for exemptions on December 31, 2009. DPR anticipates making a final determination regarding this reevaluation in the third quarter of 2010.

CERTAIN AGRICULTURAL AND COMMERCIAL STRUCTURAL USE LIQUID FORMULATION PESTICIDE PRODUCTS (REFORMULATION) – 437 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.

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.

On February 11, 2010, DPR notified all registrants in the reformulation reevaluation that DPR's review of reformulation reevaluation responses is complete. DPR determined that the best way to reduce VOC emissions from non-fumigants is to concentrate on those products that provide the highest contribution of VOCs during the ozone season in three NAAs (San Joaquin Valley, Southeast Desert, and Ventura). Such products contain the active ingredients abamectin, chlorpyrifos, dimethoate, gibberellins, oxyfluorfen, permethrin, and trifluralin.

DPR narrowed the reformulation reevaluation to focus on the seven active ingredients listed above and anticipates scheduling meetings with individual registrants of products containing the active ingredients during the third quarter of 2010. The purpose of the meeting will be to discuss actions to meet DPR's SIP mandates. These actions may include, but are not limited to, restrictions on non-fumigant use, prohibiting use of identified VOC emitting products, and/or applying formulation restrictions during the ozone season in the NAAs.

CERTAIN PESTICIDE PRODUCTS CONTAINING PYRETHROIDS – 542 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 California waterways dominated by both agricultural and urban runoff, at levels toxic to *Hyaella 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. Although the causal link between pyrethroid sediment toxicity and concentration is based largely on correlation, the correlations are significant, consistent with predicted toxicities based on laboratory measured LC50s, and there is no general alternative explanation for the 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.

Other Group I Active Ingredients

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 2010.

Group II Active Ingredients

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 a commitment by registrants of Group II active ingredients to implement the same 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. In November 2009 the registrant submitted the required study. DPR anticipates reviewing the studies to determine the acceptability by the third quarter of 2010.

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. In May 2010, PWG submitted a progress report in lieu of the final report documenting challenges experienced with the method. DPR anticipates responding to PWG in the third quarter of 2010.

Sediment Acute and Chronic Toxicity

In July 2008, the PWG submitted a revised sediment toxicity testing proposal. DPR reviewed this revised testing proposal and found it acceptable in letter dated

Group III Active Ingredients

Sediment Acute and Chronic Toxicity (Continued)

September 2008. The letter required 10-day sediment toxicity tests with *H. azteca* and *Chironomus dilutus* (*C. spp*) and cold temperature studies in the second quarter of 2010. DPR deferred the 42-day *H. azteca* chronic studies until two and one-half years after U.S EPA's Office of Prevention, Pesticides and Toxic Substances (OPPTS) finalizes 850 test guidelines addressing whole sediment life cycle toxicity tests for *H. azteca* and *C. spp*. DPR received the first of three progress reports in April 2009, the second in October 2009, and the third in April 2010. These progress reports address the sediment toxicity testing program being conducted by the PWG.

In May 2009, DPR received the preliminary study on the impact of organic carbon on pyrethroid toxicity. DPR solicited comments from stakeholders and anticipates providing a review in the third quarter of 2010.

Part 3 – Transport Mechanisms and Mitigation

Investigations in Agricultural 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 report entitled, “PWG 07-01: The Use of Agricultural Sediment Basins and Polyacrylamide (PAM) as Best Management Practices in Irrigated Tomatoes.” DPR anticipates reviewing this report and allowing for stakeholder comment in the third quarter of 2010.

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 California Stormwater Quality Association (CASQA) on these two proposals. In May 2008, DPR notified PWG that their study protocols should accomplish the following objectives: identify the most important above ground building material scenarios for potential future management practice studies; and compare runoff losses

Group III Active Ingredients

February 2008 Investigations of Urban Settings: Building Materials and Turf (Continued)

from grass irrigated under best practice to reduce runoff losses from excessive lawn irrigation. In January and March 2009, DPR received the respective final reports entitled, "Washoff/Runoff of Cypermethrin Residues from Slabs of External Building Material Surfaces Using Simulated Runoff" and "Quantification of Pyrethroid Runoff Losses from Treated Turfgrass Under Over-Irrigation Conditions and Simulated Rainfall." DPR anticipates reviewing these final reports and stakeholder comments in the third quarter of 2010.

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, UC Berkeley, CASQA, and U.S. EPA, Region 9. Later that month, PWG postponed further development for this study due to lack of participating cities. In March 2009, DPR provided PWG with comments and requested a full study protocol before initiating the study. In April 2009, the PWG submitted a draft study protocol entitled, "Study Design for Study Number 08-03: Controlled Use Urban Monitoring Study." In December 2009, DPR met with PWG to discuss progress of the Controlled Use Monitoring Study. Unfortunately, this study will not proceed due to lack of support by the cities for applications on a watershed level. At this time, PWG is not pursuing this particular study.

U.S. EPA coordination efforts with DPR: Environmental Hazard and General Labeling for Pyrethroid Non-Agricultural Outdoor Products

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 mitigation measures addressing urban runoff. The proposed mitigation measures included modifying labels to state 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 May 2008, PWG met with U.S. EPA to discuss the possibility of adding the mitigation measures to labeling of all pyrethroid containing products.

Group III Active Ingredients

U.S. EPA coordination efforts with DPR: Environmental Hazard and General Labeling for Pyrethroid Non-Agricultural Outdoor Products (*Continued*)

In September 2008, U.S. EPA communicated their support of the mitigation measures put forth by California stakeholders in October 2007. In October and November 2008, DPR coordinated review of U.S. EPA mitigation 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). On June 4, 2009, U.S. EPA mailed 231 letters notifying registrants of the environmental hazard and general labeling for pyrethroid non-agricultural outdoor products notifying them of the required label changes. Specifically, label statements appearing in the “Directions for Use” section is based upon formulation and use specific statements. In addition, the mitigation labeling implements PR Notice 2008-1 “Environmental Hazard General Labeling Statements on Outdoor Residential Use Products.”

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. After considering comments from CASQA, U.S. EPA Headquarters and Region 9, Pest Control Operators of California (PCOC), SWRCB, and PWG, in a letter to PWG and pyrethroid registrants dated November 2, 2009, DPR finalized its approach to require additional studies investigating offsite movement of pyrethroids specific to urban uses. The change in approach was deemed necessary because several previously submitted concepts and study protocols would not have adequately characterized offsite movement of pyrethroids in the urban environment. Source identification for agricultural settings will be addressed at a later time.

Urban Pathway Conceptual Model and Pest Control Business Survey

The November 2009 DPR letter to PWG and pyrethroid registrants required PWG to develop an urban pathway conceptual model and conduct a survey of pest control businesses within a short timeframe. The conceptual model will identify pathways that link urban pesticide sources with receiving waters. The pest control business survey will assess the relative contribution of different pyrethroid use patterns applied by these businesses in the urban setting. In December 2009, DPR received a draft white paper of a Web-based pest control business survey. This survey received significant contributions from PCOC and received additional stakeholder review on January 13, 2010. On February 10, 2010, DPR found the pest control business survey adequate to gather information regarding pyrethroid use in urban areas required as part of the reevaluation. DPR anticipates receiving the final report of the survey in the third quarter of 2010.

Group III Active Ingredients

Urban Pathway Conceptual Model and Pest Control Business Survey (Continued)

On January 27, 2010 DPR received PWG's conceptual model entitled, "Problem Formulation: Ecological Evaluation of Pyrethroids in the Urban Environment." DPR provided the conceptual model to stakeholders for comment.

Pyrethroid Reevaluation Stakeholder Meeting (PRSM)

On May 17, 2010, DPR initiated its first monthly PRSM meeting. The intent of the PRSM is to bring stakeholders together to discuss data gaps, establish priorities, and provide input on the proposed urban conceptual model. The PRSM workgroup meetings occur every third Monday of each month. The stakeholders include CASQA, PCOC, Tri-TAC, SWRCB, CVRWQCB, San Francisco Regional Water Quality Control Board, PWG, Sumitomo Chemical Company, U.S. EPA, and U.S. EPA, Region 9.

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 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. 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 April 2009, DPR reviewed the preliminary POTW monitoring study design and determined 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. DPR anticipates setting a deadline for submission of the POTW monitoring study protocol in the third quarter of 2010.

CERTAIN FIELD SOIL FUMIGANT PRODUCTS – 64 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 Alliance of Methyl Bromide Industry and Chloropicrin Manufacturers Task Force to discuss several aspects of the reevaluation. At the first meeting, DPR presented the objectives of the reevaluation: review single active ingredient 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: 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. 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, registrants submitted statements of intent to generate studies, requested that they be allowed to use computer modeling to satisfy some of the study requirements, and identified a prioritization scheme for development of study protocols to address the data requirements of the reevaluation. Subsequently, DPR conducted an extensive evaluation to determine whether computer modeling would be an appropriate substitute for conducting some field monitoring studies. DPR anticipates responding to the registrants' proposals for conducting field studies and computer modeling, and the prioritization scheme by the fourth quarter of 2010.

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 September 2008, one registrant submitted an existing single story monitoring study. In October 2008, another registrant submitted a proposed monitoring study protocol. In July 2009, DPR found the study protocol to be insufficient. In September 2009, a revised study protocol was submitted which DPR again found to be deficient. 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 from a fumigation involving multiple-story multiple dwelling units (i.e., condominiums, town houses, apartment complexes.) In February 2010, DPR received a revised study protocol for both the single and multiple story structures. In April 2010, DPR found the study protocol to be acceptable and stated the deadline to submit the final results would be on or before April 8, 2011.

Before the registrant could initiate the monitoring study, DPR announced another data requirement on June 14, 2010. Sulfuryl fluoride product labels require the use of chloropicrin as a warning agent when fumigating homes. Chloropicrin is a toxic gas that causes eye and respiratory irritation at low levels. DPR is requiring registrants to monitor for both sulfuryl fluoride and chloropicrin in single and multiple story, multiple dwelling residences. In June 2010, one registrant submitted an existing residential and multi-unit structure

sulfuryl fluoride and chloropicrin monitoring study. A revised study protocol to include monitoring of chloropicrin is anticipated to be submitted by the other registrant in the third quarter of 2010.

NITROGUANIDINE INSECTICIDE CLASS OF NEONICOTINOIDS – 222 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 ornamental plant residue studies 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: (1) high levels of imidacloprid in leaves and blossoms of treated plants, and (2) increases in residue levels over time. The data indicate that the above neonicotinoids are likely to move into blooming plants and create a hazard for honey bees and other pollinators.

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 in plant leaves and blossoms 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 leaf and blossom residue 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 where high imidacloprid residue levels were found in leaves and blossoms were comparable to application rates 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 a 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.

On April 2009, DPR staff met with registrants and provided an opportunity to comment on DPR's proposed data requirements. Additionally, U.S. EPA's Office of Pesticide Programs (OPP) and Pest Management Regulatory Agency (PMRA) Health Canada attended via conference call. After considering comments received and consulting with U.S. EPA's OPP and PMRA, in September 2009, DPR notified registrants of its final data requirements. The required data include field-based residue analysis in pollen and nectar from specific agricultural orchard and row crops for each of the four active ingredients. Additionally, under the reevaluation, DPR is requiring registrants to conduct an LC₅₀ study on honey bees starting with the larval stage through emergence.

In November 2009, the dinotefuran registrant submitted information about the environmental fate and behavior of its products as well as existing data they felt satisfied the reevaluation data requirements in lieu of the requested study protocols. Additionally, in November 2009, the clothianidin registrant documented its limited use in California and inability to perform field studies as requested under the reevaluation. Instead, they proposed to conduct small-scale studies, analogues to magnitude of residues studies, on cucurbit. DPR anticipates responding to both registrants in the third quarter of 2010.

DPR has been in close contact with the thiamethoxam registrant as they locate fields to conduct field sampling on pome fruit, fruiting vegetables, strawberries, and melons. Draft study protocols were received and reviewed by DPR, U.S. EPA, and PMRA. Due to the limited field applications for pome fruit in 2009, this study will be postponed until the 2011 growing season. Similarly, for strawberries, the actual field use and cultural practices make strawberries a specious representative crop. The registrant will document their findings for DPR's consideration. However, for fruiting vegetables, there are sufficient fields and soil variations to generate data on processing tomatoes for 2010. Field location for sampling cucurbits is not as promising as fruiting vegetables. DPR anticipates receiving final study protocols and the strawberry rationale document in the third quarter of 2010.

DPR has been in close contact with the imidacloprid registrant as they develop the largest data set of the four active ingredients. In November and December 2009, the registrant submitted information and existing data to address DPR's reevaluation data requirements for field data on almonds, citrus, cotton, cucurbits, fruiting vegetables, pome fruit, and strawberries. In March 2010, DPR hosted a technical meeting with the registrant, with U.S. EPA and PMRA participating by conference call. At this meeting, the registrant discussed study protocols for the crops identified in DPR's reevaluation, provided their plan for addressing almonds through removing the use on their labels federally, and discussed existing research on citrus being conducted at UC Riverside. In April 2010, DPR, U.S. EPA, and PMRA participated in a technical conference call between UC Riverside and the registrant to discuss the ongoing research with citrus trees for managing Asian citrus psyllid. Also in April, the registrant submitted draft study protocols for cotton, fruiting vegetables, melons, pome fruit, and strawberries, which were reviewed by DPR, U.S. EPA, and PMRA. DPR anticipates receiving

final study protocols for cotton and tomatoes in the third quarter of 2010 and the remaining crops in early 2011.

COPPER-BASED ANTIFOULING PAINT PESTICIDES – 190 Products

On June 1, 2010, DPR placed pesticide products containing the active ingredients copper oxide, copper hydroxide and cuprous thiocyanate and intended for use as antifouling paint (AFP) pesticides into reevaluation. 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 indicates 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 for copper. Dissolved copper concentrations in about a third of the water samples in these marinas also exceeded the acute standard. Several other marina surveys of Southern California coastal marinas produced similar findings.

In the DPR study, toxicity was also observed in a number of marina water samples. Tests indicated that copper was the likely cause of the toxicity. Since California Regional Water Quality Control Boards' (RWQCBs) water quality control plans require that all waters shall 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, this toxicity violates RWQCBs water quality objective for toxicity.

DPR's report concluded that in salt and brackish water marinas, copper AFP pesticide products applied to boat hulls are likely a major source of copper in these areas, particularly during dry weather periods. Passive leaching of AFP-painted boat hulls and underwater boat-hull cleaning appear to be the main pathways of copper contamination.

Pursuant to the reevaluation data call-in, copper based AFP pesticides are required to submit: (1) information regarding the identification of the type of paint product (e.g., soft sloughing, epoxy ester conventional, vinyl conventional, vinyl thin film Teflon, water-based ablative, copolymer ablative, etc.), (2) data indicating the products' copper release (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 as supported with scientific data demonstrating effectiveness, and (4) marina monitoring data to determine compliance with CTR standards after mitigation strategies have been implemented. DPR anticipates receiving paint identification information, leach rate data, and mitigation strategies in the fourth quarter of 2010.

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.

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, Staff Environmental Scientist in the Pesticide Registration Branch, by e-mail at <dalder@cdpr.ca.gov> or by telephone at (916) 324-3522.

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