



CENTER ON RACE, POVERTY & THE ENVIRONMENT

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December 22, 2017

Ann M. Prichard, Chief
Pesticide Registration Branch
Department of Pesticide Regulation
1001 I Street
Sacramento, CA 95812

Re: Notice of Proposed Decision to Renew Pesticide Product Registrations for 2018, Director's Findings and Public Report (California Notice 2017-14)

Dear Ms. Prichard:

On behalf of the Center on Race, Poverty & the Environment and Californians for Pesticide Reform, we are writing to urge DPR not to renew any pesticide products containing chlorpyrifos. Should DPR decline to cancel pesticide products containing chlorpyrifos, we urge DPR to at least suspend all products containing chlorpyrifos or alternatively, re-evaluate all products containing chlorpyrifos.

I. ABOUT CHLORPYRIFOS

Chlorpyrifos is an organophosphate pesticide that poses two types of serious public health risks. First, it is acutely toxic and causes systemic illnesses by inhibiting the body's ability to produce cholinesterase, an enzyme necessary for the proper transmission of nerve impulses.¹ Second, a growing body of published scientific research links exposure to chlorpyrifos with long-term harmful human health effects, including neuro-developmental disorders, hyperactivity, attention deficit disorder, low birth weights, and reduced newborn head circumference, which is indicative of impaired cognitive ability.² Chlorpyrifos has repeatedly been among the leading

¹ USEPA 2016. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review.

USEPA 2014. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. 1–531 pp.

² Wyatt RM, V Rauh, DB Barr et al. 2004. Prenatal insecticide exposures and birth weight and length among an urban minority cohort. *Env. Health Perspect.* 112(10):1125-32. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1247388/>;

Berkowitz GS, JG Wetmur, E Birman-Deych et al. 2004. In utero pesticide exposure, maternal paraoxonase activity, and head circumference. *Env. Health Perspect.* 112(3):388-91. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1241872/>;

Furlong, CE, N Holland, RJ Richtera et al. 2006. PON1 status of farmworker mothers and children as a predictor of organophosphate sensitivity. *Pharmacogenetics and Genomics* 16:183–190. Available at <https://ai2-s2-pdfs.s3.amazonaws.com/f4b5/936bd2510ad-797d74da64053a71f747c00d8.pdf>

pesticides causing pesticide poisonings of workers and those who live near places where it is applied. It is used on a variety of crops – top crops in California are almonds, oranges (and other citrus), cotton, alfalfa and walnuts.³

People are exposed to chlorpyrifos through air, water, skin and food. There are serious occupational exposure risks to those who handle the pesticide and to workers when they re-enter treated fields. Workers, as well as children and other bystanders, are exposed to chlorpyrifos through direct drift and volatilization.

II. DPR SHOULD CANCEL OR DENY ALL PESTICIDE PRODUCT REGISTRATIONS CONTAINING CHLORPYRIFOS

A. DPR's Decision to Renew Pesticide Products Is Discretionary.

DPR asserts that “the annual renewal of Certificates of Registration is a non-discretionary duty that must be taken if certain requirements... are satisfied by the registrant.” However, the California Food and Agricultural Code provides ample discretion to the Director to deny renewal requests. Title 3, Section 6215 of the California Code of Regulations states in pertinent part: “Each renewal shall be issued within 60 days after the director receives an accurate and complete renewal application, unless the director takes action pursuant to Sections 12816, 12825, or 12827 of the Food and Agricultural Code.”

DPR has interpreted this language as giving DPR a mandatory duty to renew Certificates of Registration. However, as the language of Section 6215 indicates, the Director has the discretion to take action pursuant to Section 12816, 12825, or 12827 of the Food and Agricultural Code. Under these sections, the Director has the discretion to cancel the registration of or refuse to register a product.

Here Section 6215 makes renewal contingent upon (1) the submission of an accurate and complete application and (2) the Director not taking action pursuant to Sections 12816, 12825, and 12827 of the Food and Agriculture Code. Thus, the Director must use his discretion to determine both the accuracy and completeness of each application and to determine whether to take action pursuant to the Food and Agriculture Code instead of renewing registrations. The Director is empowered to use his judgment to determine what course of action he must or should take with regard to each application.

In addition, and as discussed in further detail below, DPR's own regulations explicitly provide that the agency “shall not approve an activity which would cause a significant adverse environmental impact if there is a feasible alternative or feasible mitigation measure available which would substantially lessen any significant adverse impact which implementation of the proposal may reasonably be expected to have on the environment.” (Cal. Code Regs., tit. 3, § 6254.)

³ CDPR 2017. Draft Evaluation of Chlorpyrifos as a Toxic Air Contaminant: Risk Characterization of Spray Drift, Dietary, and Aggregate Exposures to Residential Bystanders. 22-27 pp.

DPR is not mandated to renew registrations of pesticide products as its own regulations specify instances where doing so is forbidden or discretionary. DPR has erroneously interpreted its duty and should elect to decline the renewal of all products containing chlorpyrifos.

B. The Director should cancel the registration of, or refuse to register, products containing chlorpyrifos.

Section 12825 of the California Food and Agriculture Code provides instances by which the Director may cancel the registration of, or refuse to register pesticide products. Listed below are the sections relevant to chlorpyrifos.

- i. Section 12825(a) states “The Director may cancel the registration of, or refuse to register any pesticide that has demonstrated serious uncontrollable adverse effects either within or outside the agricultural environment.”**

Chlorpyrifos is an organophosphate pesticide with damaging effects on the human nervous system including during prenatal and childhood development. Chlorpyrifos blocks acetylcholinesterase that human brains need to control acetylcholine, one of the many neurotransmitters mediating communication between nerve cells. Furthermore, the scientific evidence of neurotoxic dangers associated with chlorpyrifos exposure is extensive and consistent, particularly for fetuses and children, who are at elevated risk due to their ongoing brain and nervous system development. The U.S. Environmental Protection Agency’s (EPA) most recent assessment, which incorporated recommendations from the final report of a Scientific Advisory Panel (SAP), states there is “sufficient evidence that there are neurodevelopmental effects occurring at chlorpyrifos exposure levels below that required for AChE inhibition,” and that EPA’s current approach for evaluating chlorpyrifos’s neurological impact is “not sufficiently health protective.” Please refer to Appendices E-G for a more detailed analysis on the strength of the scientific evidence for the harms of chlorpyrifos.

Several recent studies demonstrate that exposure to low levels of chlorpyrifos or organophosphates negatively impacts various aspects of cognitive development in humans, including:

- In California’s Salinas Valley, a UC Berkeley study found that the group exposed to the highest levels of organophosphate during pregnancy was associated with a 7-point drop in IQ scores in 7-year-olds.⁴
- A Columbia University study found decreases in full-scale IQ and working memory of 7-year-olds associated with tiny increases in prenatal exposure to chlorpyrifos. Another study of the same group found that 3-year-old children with higher prenatal exposures to chlorpyrifos were more likely to experience delays in

⁴ Maryse F. Bouchard, *et.al.* 2011 Prenatal Exposure to Organophosphate Pesticides and IQ in 7-Year-Old Children. *Environ Health Perspect* 119:1189-1195.

development, attention problems, ADHD problems and pervasive developmental disorder problems.⁵

- A UC Davis study found that mothers who live within a mile of fields where chlorpyrifos and other organophosphate pesticides were applied had a 60 percent higher chance of having children with autism spectrum disorder. The link between autism and pesticides may be that gestational exposures tip the balance towards increasing autism risk.⁶
- In addition, a recent study found associations between exposure to chlorpyrifos and changes to the architecture of the brain in 7-year old children.⁷

In November 2017, the Office of Health Hazard Assessment categorized chlorpyrifos as a developmental toxicant, adding it to California's Proposition 65 list of substances known to the State to cause birth defects or other reproductive harm.⁸ According to the chief deputy director of OEHHA, the scientific panel which reviewed the chemical "felt that all of the information from these studies taken together clearly showed that exposure to chlorpyrifos can harm the development of a child."⁹

Current uses and application rates are not protective of public health. A Center for Disease Control and Prevention study showed that children carry particularly high levels of chlorpyrifos — almost twice those of adults. Farmers, pesticide applicators and chlorpyrifos manufacturing workers likewise carry a greater body burden of the neurotoxic insecticide. Further, like most organophosphates, chlorpyrifos is prone to drift. The semi-volatile chemical readily evaporates from leaf and soil surfaces to become airborne, especially when outdoor temperatures are high. Once in gas form, the neurotoxicant can migrate to nearby homes and schools — exposing residents and their children. Chlorpyrifos is also linked with reduced birth size and is a suspected endocrine disruptor.

A drift study in Lindsay, California, demonstrated the presence of chlorpyrifos in the air near or at homes in the agricultural community. Over 100 air samples were collected near homes and three-quarters of the samples had detectable levels. Eleven percent of the samples were above the levels determined to be at an "acceptable" level for a 24-hour exposure by children. The highest concentration observed was nearly eight times the acceptable level.¹⁰ California's Department of Pesticide Regulation (DPR) 2014 air monitoring data found chlorpyrifos in 26

⁵ Virginia Rauh, *et al.* 2011. Seven-Year Neurodevelopmental Scores and Prenatal Exposure to Chlorpyrifos, a Common Agricultural Pesticide. *Environ Health Perspect* 119:1196-1201.

⁶ Janie F. Shelton, *et al.* 2014. Neurodevelopmental Disorders and Prenatal Residential Proximity to Agricultural Pesticides: The CHARGE Study. *Environ Health Perspect* 122:1103-1109.

⁷ Virginia Rauh, *et al.* 2012. Brain Anomalies in Children Exposed Prenatally to a Common Organophosphate Pesticide. *Proc Natl Acad Sci USA* 109:7871-7876.

⁸ OEHHA 2017. Chemicals Listed Effective December 15, 2017 as Known to the State of California to Cause Reproductive Toxicity: Chlorpyrifos and n-Hexane. <https://oehha.ca.gov/proposition-65/crn/chemicals-listed-effective-december-15-2017-known-state-california-cause>

⁹ Sammy Caiola, Chlorpyrifos Makes California List of Most Dangerous Chemicals, Capital Public Radio (December 1, 2017).

¹⁰ Katherine Mills and Susan Kegley, (2006) Air Monitoring for Chlorpyrifos in Lindsay, California. Available at https://www.pesticideresearch.com/site/docs/Lindsay-CP_7_18_06.pdf.

percent of the year's samples from three sites.¹¹ There have been several recent incidents involving chlorpyrifos drift from field applications that have put nearby workers and communities at risk, and recent air monitoring data reveal that chlorpyrifos residues are more than 18 times higher than federal levels of concern.¹²

The 2016 EPA Revised Human Health Risk Assessment shows dietary, drinking water, and inhalation risks for the current uses of chlorpyrifos.¹³ Based on current labeled uses, the revised analysis indicates that expected residues of chlorpyrifos on food crops exceed the safety standard under the Federal Food, Drug, and Cosmetic Act. The EPA compared the new target risk level to the amount of chlorpyrifos residues on fruits and vegetables regularly consumed by women and children and found that residues from chlorpyrifos are on many of foods at levels up to 14,000 percent higher than the "safe" limits.¹⁴

In addition, the majority of estimated drinking water exposure from currently registered uses, including water exposure from non-food uses, continues to exceed safe levels, even taking into account more refined drinking water exposure. U.S. EPA analysis of air monitoring data from California found unacceptable risk from inhalation alone - exposure levels were found to exceed the target risk level for pregnant women by up to 44 times. The assessment also demonstrated risks to workers who mix, load and apply chlorpyrifos pesticide products.

Additionally, the renewal of chlorpyrifos will adversely impact wildlife and aquatic systems. Chlorpyrifos is moderately persistent in soil and can take weeks to years to break down. The insecticide can reach rivers, lakes and streams, where it concentrates in the fatty tissue of fish. According to the National Water Quality Assessment Program, chlorpyrifos contaminated surface water in urban and agricultural streams at levels potentially harmful to aquatic life.¹⁵ Current chlorpyrifos application amounts and methods have resulted in contamination of drinking water, leading EPA to declare that chlorpyrifos use poses "drinking water exposure concerns in small sensitive watersheds throughout the Country.

For animals that are highly sensitive to chlorpyrifos, exposure to minute concentrations can be lethal. EPA indicates that a single application of chlorpyrifos poses significant risks — especially to endangered species. Fish, amphibians, birds, reptiles and small mammals, as well as bees and other beneficial insects are vulnerable to current application levels of chlorpyrifos.

¹¹ Atac Tuli, *et al.* May 2015. Department of Pesticide Regulation. Air Monitoring Network Results for 2014, available at http://www.cdpr.ca.gov/docs/emon/airinit/amn_2014_report_draft.pdf.

¹² CDPR 2017. AIR MONITORING NETWORK RESULTS FOR 2106. Environmental Monitoring Branch. Sacramento, CA.

¹³ USEPA 2016. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review.

¹⁴ EPA concluded the following: 14,000 percent higher than the "safe" limits for children ages 1-2 years of age; 11,000 percent higher than the "safe" limits for children ages 6-12 years of age; 9,300 percent higher than the "safe" limits for infants less than 1 year old; and 6,200 percent higher than the "safe" limits of women of child-bearing age (13-49 years of age).

¹⁵ Pesticide National Synthesis Project. Available at <https://water.usgs.gov/nawqa/pnsp/>

- ii. **Section 12825(c) states “The Director may cancel the registration of, or refuse to register any pesticide for which there is a reasonable, effective, and practicable alternate material or procedure that is demonstrably less destructive to the environment.”**

There are readily available, feasible alternatives to most chlorpyrifos uses. Data from California’s Pesticide Use Reporting Program suggests that alternatives the chlorpyrifos are readily available: in 2010, for the leading uses of the pesticide on almonds, alfalfa, walnuts, oranges, cotton, grapes, and broccoli, over half of all growers of each crop were not using chlorpyrifos.¹⁶

In addition, in 2015, the U.S. EPA issued a memorandum of its Analysis of the Small Business Impacts of Revoking Chlorpyrifos Food Tolerances.¹⁷ The memorandum presented the results of EPA’s analysis to determine whether revoking chlorpyrifos food tolerances could have a potential significant economic impact on a substantial number of small farms. EPA concluded that only 3.25 percent of farms could be affected.¹⁸ And of those farms affected, most will face minor economic impacts, defined as less than one percent of gross revenue, because reasonably priced alternatives are available for the pests targeted by chlorpyrifos.¹⁹ EPA noted that because it only considered currently registered alternatives to chlorpyrifos, it is likely that even more alternatives to chlorpyrifos will be available on the market as existing chemicals are registered on additional crops or new products are developed.²⁰

- iii. **Section 12825(b) states “The Director may cancel the registration of, or refuse to register any pesticide the use of which is of less public value or greater detriment to the environment than the benefit received by its use.”**

With the overwhelming scientific evidence of the harms of chlorpyrifos, coupled with the evidence that there are readily available, feasible alternatives, the use of chlorpyrifos is outweighed by its greater detriment to the environment.

EPA’s economic evaluation on small farms—the entities it determined would likely be significantly impacted by the revocation of chlorpyrifos tolerance—estimated that most of the farms will face an impact of less than one percent of gross revenue. Thus, because of the readily available, less toxic alternatives, chlorpyrifos’ benefit to the market is evidently outweighed by the risks and harms of its use. The economic effects of banning chlorpyrifos are minimal.

- iv. **Section 12825(d) states “The Director may cancel the registration of, or refuse to register any pesticide that, when properly used, is detrimental to**

¹⁶ Veena Singla, Californians need action on toxic pesticide chlorpyrifos (Feb. 17, 2014)

<https://www.nrdc.org/experts/veena-singla/californians-need-action-toxic-pesticide-chlorpyrifos>

¹⁷ USEPA 2015. Memorandum: Analysis of the Small Business Impacts of Revoking Chlorpyrifos Food Tolerances.

¹⁸ *Id.* at 2.

¹⁹ *Id.*

²⁰ *Id.* at 7.

vegetation, except weeds, to domestic animals, or to the public health and safety.”

Even when chlorpyrifos is properly used, it is detrimental to the public health and safety. In November 2016, US EPA released a revised human health risk assessment for chlorpyrifos that concluded there were no uses of chlorpyrifos that met the safety standard.²¹ The EPA also found that chlorpyrifos is found at unsafe levels in the air at schools, homes, and communities in agricultural areas. The analysis also confirmed that there is no safe level of chlorpyrifos in drinking water. Further, it concluded all workers who mix and apply chlorpyrifos are exposed to unsafe levels of the pesticide even with maximum personal protective equipment and engineering controls.²²

Even when chlorpyrifos is properly applied, it still poses a grave threat to public health and safety.

III. DPR SHOULD SUSPEND REGISTRATION OF PRODUCTS CONTAINING CHLORPYRIFOS

Section 12826 of the Food and Agriculture Code states “If the director has reason to believe that any of the conditions stated in Section 12825 are applicable to any registered pesticide and that the use or continued use of that pesticide constitutes an immediate substantial danger to persons or to the environment, the director, after notice to the registrant, may suspend the registration of that pesticide pending a hearing and final decision.”

Simply put, in order to suspend the registration of products containing chlorpyrifos, the Director (1) needs “reason to believe” that any of the relevant sections of 12825 are applicable and (2) the use of chlorpyrifos constitutes an immediate substantial danger to persons or to the environment. Both requirements of suspension are present here.

First, the Director has at least four conditions, as discussed above, that meet the “reason to believe” criteria. This prong is easy to satisfy as it does not mandate the Director conduct studies to ensure that any of the conditions of Section 12825 are indeed satisfied. All that is required is that the Director have “reason to believe” any one of the conditions are satisfied. The scientific data presented in the earlier sections of this letter provide sufficient “reasons to believe.”

Second, chlorpyrifos constitutes an immediate substantial danger to persons or to the environment. In addition to poisonings, a growing body of published scientific research from both animal and epidemiology studies links exposure to chlorpyrifos with causing

²¹ Chlorpyrifos; Tolerance Revocations; Notice of Data Availability and Request for Comment. Federal Register /Vol. 81, No. 222. p 81050

²² USEPA 2016. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. 37 pp. Available at <https://www.epa.gov/pesticides/updated-human-health-risk-analyses-chlorpyrifos>.

neurodevelopmental harm to children’s brains.²³ An extensive body of published animal studies reveals cognitive, motor control, and social behavior impacts from chlorpyrifos exposures.²⁴

Additional evidence of neurodevelopmental harm from chlorpyrifos has come from three population cohorts studied by university research teams.²⁵ Each study enrolled pregnant women and conducted long-term birth cohort studies of different populations with different types of exposures. However, they produced convergent results—all found that prenatal exposures to pesticides were statistically correlated with cognitive impairments that persist into a children’s young school years. One particular study done at Columbia University was specific to chlorpyrifos.

In 2014, U.S. EPA released its Revised Human Health Risk Assessment for Chlorpyrifos and acknowledged the strong convergence in the findings from the animal studies and the three mother-child cohort studies.²⁶ It found that the laboratory animal studies indicated “that gestational and/or postnatal exposure may cause persistent behavioral effects into adulthood.”²⁷ Further, EPA concluded that “exposure to chlorpyrifos results in adverse neurodevelopmental outcomes in humans.”²⁸

These harmful acute and chronic effects of chlorpyrifos establish an immediate and substantial danger to persons required for suspension.

IV. THE DIRECTOR MUST NOT APPROVE RENEWAL OF CHLORPYRIFOS PRODUCTS BECAUSE IT WOULD CAUSE SIGNIFICANT ADVERSE IMPACTS AND FEASIBLE MITIGATION MEASURES OR ALTERNATIVES WOULD SUBSTANTIALLY LESSEN THAT IMPACT.

Pursuant to Title 3, Section 6254 of the California Code of Regulations, “the Director shall not approve an activity which would cause a significant adverse environmental impact if there is a feasible alternative or feasible mitigation measure available which would substantially lessen any significant adverse impact which implementation of the proposal may reasonably be expected to have on the environment.” 3 CCR § 6254. DPR’s proposal to renew pesticide

²³ Rauh V, S Arunajadai, M Horton et al. 2011. Sevenyear neurodevelopmental scores and prenatal exposure to chlorpyrifos, a common agricultural pesticide. *Env. Health Perspect.* 119:1196-1201. <https://ehp.niehs.nih.gov/1003160/>

²⁴ Rauh, VA, R Garfinkel, FP Perera et al. 2006. Impact of prenatal chlorpyrifos exposure on neurodevelopment in the first 3 years of life among inner-city children. *Pediatrics* 118(6):e1845-e1859. <http://pediatrics.aappublications.org/content/118/6/e1845>;

Shelton JF, EM Geraghty, DJ Tancredi et al. 2014. Neurodevelopmental disorders and prenatal residential proximity to agricultural pesticides: the CHARGE study. *Env. Health Perspect.* 122:1103-1109. <https://ehp.niehs.nih.gov/wp-content/uploads/122/10/ehp.1307044.alt.pdf>

²⁵ A research team at University of California-Berkeley followed a cohort of children born to farmworkers in Salinas Valley in California. A Mount Sinai School of Medicine study observed a New York City Hispanic population. A research team at Columbia University followed African American and Dominican children in New York City.

²⁶ USEPA 2014. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. EPAHQ-OPP-2008-0850-0195.

²⁷ *Id.* at 26.

²⁸ *Id.* at 49.

products containing chlorpyrifos will cause significant environmental impacts, and alternatives exist that would substantially reduce those impacts. DPR's conclusory findings to the contrary are erroneous and wholly unsupported. Therefore, the Director may not approve the renewal of pesticides containing chlorpyrifos.

A. The Renewal of Products Containing Chlorpyrifos Will Cause Significant Adverse Environmental Impacts

DPR's decision to renew chlorpyrifos products will cause significant negative adverse impacts to the environment, including to public health, wildlife and water systems.

Please refer to section II(B)(i) for a detailed discussion of the significant adverse environmental impacts of pesticide products containing chlorpyrifos.

B. Mitigation Measures or Alternatives Can Reduce Adverse Effects

Multiple agencies and non-governmental organizations have analyzed alternatives to chlorpyrifos extensively. There are numerous feasible alternatives to the application of chlorpyrifos which would substantially lessen its adverse impacts on the environment and human health. The EPA conducted an analysis of the small business impacts of revoking chlorpyrifos food tolerances and concluded that revoking the food tolerances for chlorpyrifos will not have a significant economic impact on a substantial number of small entities because reasonably priced alternatives are available for the pests targeted by chlorpyrifos.²⁹

An extensive New Zealand review of chlorpyrifos alternatives included more than 20 crops, and more than 20 pests or pest groups for which were identified 18 different predatory or parasitic arthropods, four bacterial or fungal controls, and four least hazardous chemical controls.³⁰ Additionally, EPA committed to a goal of 75% of U.S. cropland using integrated pest management (IPM) by the year 2000. While the United States is far from meeting its goal, ecosystem-based pest management should be a priority for replacing hazardous pesticides such as chlorpyrifos. IPM uses information and human skills to prevent pests from becoming a problem, but when they do, there are four categories of alternatives: 1) IPM Systems and other Biologically Based Practices; 2) Biological Pesticides, or Biopesticides; 3) Non-Conventional or "Reduced Risk" Pesticide Active Ingredients; and 4) Conventional alternatives.

Alternatives are proven in practice. On April 1, 2016, the United Kingdom banned chlorpyrifos (with one exception for brassica seedling drench treatment applied via automated gantry sprayer). There is no evidence that the agriculture industry in the United Kingdom has suffered measurable harm due to its ban on chlorpyrifos.

²⁹ United States Environmental Protection Agency. Analysis of the Small Business Impacts of Revoking Chlorpyrifos Food Tolerances. October 27, 2015.

³⁰ Chapman, Bruce. 2010. A review of insecticide use on pastures and forage crops in New Zealand. <http://agpest.co.nz/wp-content/uploads/2013/06/A-review-of-insecticide-use-on-pastures-and-forage-crops-in-New-Zealand.pdf>

C. DPR's Findings of No Significant Impact Are Erroneous and Wholly Unsupported.

The Director found that the renewal of products containing chlorpyrifos “maintains the status quo and will not cause either a direct or a reasonably foreseeable indirect physical change in the environment that constitutes a significant adverse environmental effect.” Public Notice. This finding misstates the applicable standard, fails to consider significant new information, and is conclusory and wholly unsupported.

DPR's registration and renewal processes have been certified as regulatory programs and are exempt from CEQA requirements for preparation of EIRs and negative declarations. Pub. Res. Code § 21080.5. But DPR must rely on environmental review documents prepared under the agency's own regulations instead of documents that would be required by CEQA. Pub Res. Code § 21080.5; 14 CCR § 15250. Here, DPR's regulation requires it to disclose adverse impacts associated with its activities, including pesticide renewals; disclose mitigation measures and alternatives that reduce significant impacts, and refrain from approving an activity if there is a feasible alternative or feasible mitigation measure available which would substantially lessen any significant adverse impact. 3 CCR § 6254.

The proper measurement of project impacts is whether the renewal and reauthorization of the use of chlorpyrifos would have an impact on the environment as compared to not renewing the pesticide product. Without product renewal, the use of chlorpyrifos would be phased out. DPR assumes that it need not disclose adverse impacts since the activity maintains the status quo. DPR's interpretation of its regulation is flawed as it would render it meaningless. By definition, any pesticide renewal activity would maintain the status quo, yet Article 12 – in which section 6254 appears – facially applies to the department's renewal process. DPR should have disclosed the adverse environmental impacts of continuing to use chlorpyrifos in the public report. It failed to do so and violated its regulations.

Even if DPR's interpretation was correct, which it is not, DPR failed to consider significant new information and changed conditions regarding chlorpyrifos since its last renewal. DPR had no opportunity to assess adverse environmental impacts given this new information and changed conditions during the registration process or any of its past renewal decisions. Most notably, the state added chlorpyrifos to the list of chemicals known to cause developmental harm. Additionally, a number of studies published during the last year indicate that chlorpyrifos poses a greater public health risk than previously known. For example, these studies identify deficits in infant motor function associated with prenatal chlorpyrifos; the single and joint toxicity effects of chlorpyrifos in zebrafish; and reduction of sex hormones in rates exposed to low doses of chlorpyrifos.³¹ DPR also failed to disclose or include any assessment of the adverse effects disclosures submitted by chlorpyrifos applicants.

³¹Monica K Silver et al., “Prenatal Naled and Chlorpyrifos Exposure Is Associated with Deficits in Infant Motor Function in a Cohort of Chinese Infants,” *Environment International* 106 (September 2017): 248–56, doi:10.1016/j.envint.2017.05.015; Jiayu Zhang et al., “The Single and Joint Toxicity Effects of Chlorpyrifos and Beta-Cypermethrin in Zebrafish (*Danio Rerio*) Early Life Stages,” *Journal of Hazardous Materials* 334 (July 15, 2017): 121–31, doi:10.1016/j.jhazmat.2017.03.055; Dinithi Champika Peiris and Thamali Dhanushka, “Low Doses of Chlorpyrifos Interfere with Spermatogenesis of Rats Through Reduction of Sex

Finally, DPR’s conclusory finding that chlorpyrifos “will not cause a direct or a reasonably foreseeable indirect physical change in the environment that constitutes a significant adverse environmental effect” is completely unsupported by evidence or analysis. Rather the Public Report confirms that DPR did not conduct any environmental analysis of its proposed decision in direct contravention of its regulations. As such, the Director is without authority to approve the renewal of chlorpyrifos.

V. DPR SHOULD RE-EVALUATE CHLORPYRIFOS

Pursuant to Article 8, Subchapter 1, Chapter 2, Division 6 of Title 3 of the California Code of Regulations, we formally petition DPR to re-evaluate all agricultural use insecticides that contain the active ingredient chlorpyrifos. During this reevaluation, the Director must determine if chlorpyrifos should be classified as a restricted material subject to the Food and Agricultural Code or if any additional restrictions on use are necessary.

The Director must investigate all reported episodes and information he receives that indicate a pesticide may have caused, or is likely to cause, a significant adverse impact, or that indicate there is an alternative that may significantly reduce an adverse environmental impact. 3 CCR § 6220. If the Director finds from the investigation that a significant adverse impact has occurred or is likely to occur or that such an alternative is available, the pesticide involved must be re-evaluated. 3 CCR § 6220. The Director must also re-evaluate a pesticide when certain factors have been found, including but not limited to: public or worker health hazard; environmental contamination; fish or wildlife hazard; availability of an effective and feasible alternate material or procedure which is demonstrably less destructive to the environment; and the discovery that data upon which a registration was issued is false, misleading, or incomplete. 3 CCR § 6221.

Re-evaluation is warranted under both sections 6220 and 6220 of Title Three of the Code of Regulations. A substantial body of new evidence indicates that chlorpyrifos is likely to cause significant adverse impacts and that effective and feasible alternatives exist which are less destructive to the environment. This evidence includes the pesticide being recognized by the state as a developmental toxicant; the 2016 EPA revised human health risk assessment indicating dietary, drinking water, and inhalation risks for the current uses of chlorpyrifos; and numerous scientific studies indicating the pesticide’s potential for harm. *See* section II.B(i) above. For a partial list of recent studies, see Appendix H. Viable, effective and less destructive alternatives exist. *See* section IV.B above. Therefore, DPR must re-evaluate the pesticide.

At a minimum, DPR must re-evaluate chlorpyrifos because the data upon which its registration was issued is now known to be incomplete. At the time of its registration, chlorpyrifos was not known to be a developmental toxicant. Since the State has now declared the substance to be a developmental toxicant and included it on its Proposition 65 list, DPR must re-evaluate its registration, factoring in this important data.

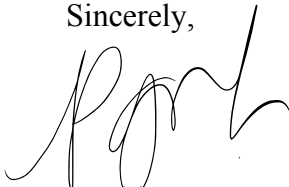
Hormones.” *Environmental Science and Pollution Research - International* 24, no. 26 (July 18, 2017): 20859–67, doi:10.1007/s11356-017-9617-x.

Finally, if “information is obtained from an individual or organization indicating possible adverse effect from the use of a pesticide, the director *shall* respond in writing to the individual or organization indicating the reasons for his or her decision either to reevaluate or not reevaluate the pesticide registration based upon the information submitted.” 3 CCR § 6222(b) (emphasis added).

VI. CONCLUSION

For all the reasons stated above, DPR should decline to renew registration of all pesticide products containing chlorpyrifos. Should DPR decline to cancel pesticide products containing chlorpyrifos, DPR should at least suspend all products containing chlorpyrifos or alternatively, re-evaluate all products containing chlorpyrifos.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ingrid Brostrom', written in a cursive style.

Ingrid Brostrom
Paulina Torres



Department of Pesticide Regulation



Brian R. Leahy
Director

Edmund G. Brown Jr.
Governor

March 28, 2018

Ms. Ingrid Brostrom, Assistant Director
Ms. Paulina Torres, Staff Attorney
Center on Race, Poverty & the Environment
1999 Harrison Street, Suite 650
Oakland, California 94612

Dear Ms. Brostrom and Ms. Torres:

Thank you for your letter in response to the Department of Pesticide Regulation's (DPR) November 14, 2017 *Notice of Proposed Decision to Renew Pesticide Product Registrations for 2018* (California Notice 2017-14). We appreciate and share your interest in examining adverse impacts, including neurodevelopmental harm that may be caused by pesticide products containing Chlorpyrifos.

As we believe the Center on Race, Poverty & the Environment is aware, DPR identified Chlorpyrifos as a potential toxic air contaminant in August 2017. The state's independent Scientific Review Panel, which consists of nine distinguished scientists with a range of expertise including toxicology, epidemiology and occupational medicine <<https://www.arb.ca.gov/srp/public.htm>>, is now reviewing the department's draft risk assessment supporting the proposed toxic air contaminant identification. The panel has met three times since the first of December 2017 and will meet again in the next few months as part of that review, which includes a thorough examination of the scientific data, procedures, methods and conclusions underlying DPR's draft risk assessment.

DPR will finalize the draft risk assessment after the Scientific Review Panel completes its review, incorporating the panel's review and guidance. The department expects that the final risk assessment will provide a strong scientific foundation for its determination of appropriate additional regulatory action to protect human health from risks identified in the final risk assessment.

Pending that action, DPR has recommended mitigation measures, which include minimum setback requirements for sensitive areas and application-specific best management practices designed to protect against health risks identified in the department's August 2017 draft risk assessment. Those mitigation measures may be used to supplement the restrictions previously incorporated by County Agricultural Commissioners into the restricted use permits required for the application of Chlorpyrifos following its designation as a California-restricted material. It is also important to note that the restricted material designation requires that application be made only by certified pesticide applicators.



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DPR is committed to effectively addressing risks posed by the continued use of Chlorpyrifos and eagerly awaits the findings of the Scientific Review Panel. If you have any questions, please contact me at 916-445-3984 or <Marylou.Verder-Carlos@cdpr.ca.gov>.

Sincerely,

Original signed by Marylou Verder-Carlos

Dr. Marylou Verder-Carlos
Assistant Director
Pesticide Programs Division

cc: Mr. Mathew Rodriguez, Secretary for Environmental Protection
California Environmental Protection Agency

Ms. Yana Garcia, Assistant Secretary for Environmental Justice
California Environmental Protection Agency

Ms. Ann Prichard, DPR Branch Chief

**Michael W. Graf
Law Offices**

227 Behrens St.,
El Cerrito CA 94530

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December 22, 2017

Pesticide Registration Branch
Department of Pesticide Regulation
P.O. Box 4015
Sacramento, California 95812-4015

RE: Comments on Department of Pesticide Regulation's Proposed Decision to Renew Rodenticide Registrations for 2018

To Whom It May Concern:

I am writing on behalf of Raptors Are the Solution and Project Coyote, both Projects of Earth Island Institute, to request that the Department of Pesticide Regulation (DPR) initiate reevaluation of rodenticide products containing the following active ingredients as part of its proposed decision to renew pesticide product registrations for the year 2018.

- (1) Brodifacoum
- (2) Bromadiolone
- (3) Difethialone
- (4) Difenacoum
- (5) Diphacinone
- (6) Chlorophacinone
- (7) Warfarin

As discussed more fully below and supported by the accompanying evidence, the continued use of anticoagulant rodenticides is likely to have significant impacts on wildlife health and the environment thereby triggering the requirements for reevaluation. *See* Food & Agriculture Code Sections 12824-12827; 3 Cal. Code of Reg. Sections 6220-6221; Public Resources Code Section 21080.5. Under DPR's CEQA certified regulatory program, DPR is required to make a finding, at the time of pesticide registration renewal, whether reevaluation is also warranted. 3 Cal. Code Reg. Sections 6215(c), 6253-6254.

A. LEGAL BACKGROUND

Pesticides used in California are registered both by the U.S. Environmental Protection Agency ("EPA") and DPR. Food & Ag. Code §12815. Through its registration powers, DPR has

authority to protect public health and safety and the environment, ensure proper labeling of pesticides and encourage less harmful alternatives to controlling pests. To protect the environment, DPR is given broad authority to deny, or cancel a registration for any pesticide that has been demonstrated to cause serious and uncontrollable adverse environmental impacts, even if the pesticide is registered under federal law. See Food & Ag. Code §§12824; 12825, 12827.5.

1. California's Pesticide Registration and Renewal Process

California's registration period for pesticide products is 12 months, at which time the registrant must apply for renewal. Food & Ag. Code §12817. Renewal is subject to the same evaluation criteria used for initial registration. Food & Ag. Code § 12824. Thus, the renewal evaluation is a discretionary decision by DPR as to whether a pesticide registration should be renewed for a year period based on the factors set forth in sections 12824 and 12825.

At the time of pesticide renewal, DPR must determine whether reevaluation of a pesticide registration is also appropriate. If DPR approves a renewal without reevaluation, the DPR director must make a "written finding that he or she has not received sufficient information necessitating reevaluation pursuant to sections 6220 and 6221." 3 Cal. Code Reg. § 6215(c.)

The criteria for whether a pesticide should be reevaluated are set forth at 3 Cal. Code Reg. Sections 6220 and 6221. Section 6220 provides:

The director may, at any time, evaluate a registered pesticide to carry out the provisions of Sections 12824, 12825, 12825.5 and 12827 of the Food and Agriculture Code. The Director shall investigate all reported episodes and information received by the Director that indicate a pesticide may have caused or is likely to cause, a significant adverse impact. If the Director finds from the investigation that a significant adverse impact has occurred or is likely to occur, the pesticide involved shall be reevaluated. 3 Cal. Code Reg. Section 6221 provides:

The director shall also reevaluate a pesticide when certain factors have been found such as, but not limited to public or worker health hazard or other information suggesting a significant adverse risk.

In response to significant information submitted on DPR's proposed decision to renew pesticide registrations, DPR is required to consult with trustee agencies such as Fish and Game and the Regional Water Quality Control Boards with jurisdiction over affected resources, (3 Cal. Code Reg. Section 6252), investigate that significant information and review available, related information (3 Cal. Code Reg. Section 6220.) and respond to the public comments received in light of the information considered as part of DPR's ultimate determination. 3 Cal. Code Reg. Sections 6253-6254. If a pesticide is reevaluated, the director shall require submission of all data required for registration of a new pesticide by the EPA and by various administrative code provisions that are relevant to the focus on the reevaluation and has not been previously submitted to the department. 3 Cal. Code Reg. § 6222(a).

During the reevaluation process, the director shall determine if the pesticide should be classified

as a restricted material pursuant to Food & Agriculture Code § 14004.5. Section 14004.5 requires DPR to designate as "restricted materials" pesticides that present a danger of harming public health or the environment including where a pesticide presents a "hazard to the environment from drift onto streams, lakes and wildlife sanctuaries;" (§ 14004.5(d)); or "hazards relating to persistent residues in the soil resulting ultimately in contamination of the air, waterways, estuaries or lakes, with consequent damage to fish, wild birds and other wildlife. (§ 14004.5(e)). Subject to limited exceptions, operators proposing to apply such "restricted" pesticides must obtain a permit from the DPR, which limits uses to prevent potential injuries to the environment. F. & Ag. Code §§ 14005-14006.

2. Application of CEQA to Pesticide Regulation in California

Under the California Environmental Quality Act ("CEQA"), a state or local agency must initiate environmental review prior to carrying out or approving any discretionary project that may have a significant impact on the environment. (Pub. Res. Code § 21080(a.)) . If the agency finds that a project may have a significant impact, the agency must prepare an environmental impact report ("EIR"). (Pub. Res. Code § 21100(a) (state agencies). *Bozung v. Local Agency Formation Com.* (1975) 13 Cal. 3d 263, 277-279; An EIR provides the public and responsible government agencies with detailed information on the potential environmental consequences of an agency's proposed decision. *See e.g. No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal. 3d 68, 81; *Sundstrom v. County of Mendocino* (1988) 202 Cal. App. 3d 296, 307.

CEQA provides a limited exemption from its EIR requirement for state agency regulatory programs whose written documentation containing environmental information serves as a functional equivalent of an EIR. Pub. Res. Code § 21080.5(a); *Sierra Club v. State Bd. of Forestry* (1994) 7 Cal. 4th 1215, 1229-1230; *Wildlife Alive v. Chickering* (1976) 18 Cal. 3d 190, 196; *Citizens for Non-Toxic Pest Control v. Department of Food & Agriculture* (1986) 187 Cal. App. 3d 1575, 1584.

California's pesticide regulatory program was certified as functionally equivalent on December 28, 1979. *See City of Sacramento v. State Water Resources Control Bd.* (1992) 2 Cal. App. 4th 960, 976-978; 14 Cal. Code Reg. § 15251(i).

As a functionally equivalent program, the pesticide registration process must still comply with the general policy goals of CEQA. *See* Pub. Res. Code § 21080.5(c); *Mountain Lion Foundation v. Fish & Game Commission, supra*, 16 Cal. 4th at 114; *Sierra Club v. State Board of Forestry, supra*, 7 Cal. 4th at pp. 1228, 1230-1231. This includes general CEQA directives that an agency consider the "cumulative impacts" of its project approvals, *EPIC v. Johnson* (1985) 170 Cal. App. 3d 604, 625, and provide timely and adequate responses to comments made by the public, *Id.* at 622; *Dunn-Edwards Corp. v. Southcoast Air Quality Management District* (1993) 19 Cal. App. 4th 519, 534). Further, to the extent that existing data suggests significant risk or indicates the potential for significant environmental impacts, DPR may not hide behind its own lack of complete data as a basis for not conducting the necessary environmental review in the form of reevaluation. *See* 3 Cal. Code Reg. Section 6222(a); *Sierra Club v. State Board of Forestry, supra*, 7 Cal. 4th at pp. 12134-1236; *Sundstrom v. County of*

Mendocino, supra, 202 Cal. App. 3d at 311.

B. EVIDENCE DEMONSTRATES THAT CONTINUING USE OF RODENTICIDES IN CALIFORNIA POSES A SIGNIFICANT RISK AND/OR IS LIKELY TO HAVE SIGNIFICANT CUMULATIVE IMPACTS ON WILDLIFE

If the Director finds from the investigation that a significant adverse impact has occurred or is likely to occur, the pesticide involved shall be reevaluated. *See* 3 Cal. Code Reg. § 6221.

The most recent data shows that rodenticide products containing active ingredients brodifacoum, bromadiolone, difethialone, difenacoum, diphacinone, chlorophacinone and warfarin continue to have significant adverse impacts to a wide range of wildlife species including species listed or candidates under the federal and state endangered species acts.

1. DPR's 2013 Risk Assessment and 2014 Regulatory Change Identified and Acknowledged Wildlife Hazard Posed by Rodenticides in California.

DPR has in the past acknowledged these adverse impacts, as part of its 2013 Second Generation Anticoagulant Rodenticide Assessment (2013 Risk Assessment), the scientific references and studies cited in which *we incorporate by reference* as part of these comments.

The 2013 Risk Assessment concluded:

DPR analyzed wildlife incident and mortality data between 1995 and 2011, and rodenticide use and sales data between 2006 and 2010. The data indicate that exposure and toxicity to non-target wildlife from second generation anticoagulant rodenticides is a statewide problem. In addition, the data suggest that the problem exists in both urban and rural areas. Research data from various locations throughout California indicate that exposure is occurring in many taxa and in various ecosystems (urban, suburban, rural, and natural/wild areas).Of the 492 animals analyzed between 1995 and 2011, approximately 73% had residues of at least one second generation anticoagulant rodenticide ...The data also show that exposure of wildlife to second generation anticoagulant rodenticides can lead to sub-lethal effects. The sub-lethal effects reduce the fitness of wildlife at a time when wildlife are already meeting numerous challenges. Riley et al's (2007) study of bobcats is an example of the sub-lethal effects of rodenticides. The bobcats died due to *Toxoplasma gondii* mange. Mange was not previously known as a significant pathogen in wild felids. However, exposure to rodenticides appears to have contributed to the disease process, and hence, the mortality of the bobcats.

2013 Risk Assessment, pp. 1-2. Based on the data reviewed, DPR found that "the use of second generation rodenticides *presents a hazard related to persistent residues in target animals resulting in impacts to non-target wildlife.*" (emphasis added.)

The 2013 Risk Assessment states that "[w]hile the data show exposure, they do not link specific uses, or location of use of second generation anticoagulant rodenticide (i.e., indoors or

outdoors, homeowners or professionals) to exposure.” Despite this lack of data, DPR determined that the banning of consumer applications of these rodenticides could potentially avoid the continued adverse effects on wildlife. Thus, on July 1, 2014, DPR adopted new regulations that restricted the purchase, possession, and use of rodenticide baits that contain the active ingredients brodifacoum, bromodialone, difenacoum, and difethialone. (The four widely used 2nd-generation anticoagulant rodenticides also known as “SGARs.”)

The 2014 regulatory amendment limited the purchase, possession, and use of SGARs to certified pesticide applicators and those under their direct supervision. DPR’s notices stated that it “adopted these regulations due to overwhelming evidence of wildlife weakened or killed by SGARs” but that “[o]ther categories of rodenticides—the 1st-generation anticoagulants, acute toxicants, and certain burrow fumigants—are still available to consumers.” *See* Frequently Asked Questions about Rodents and Rodenticides, Department of Pesticide Regulation, Pest Management & Licensing Branch, 2014 (“Rodenticide FAQs”)

At the time of this notice, DPR stated:

DPR expects that trained certified applicators will exercise caution and fulfill their professional responsibilities when using SGARs and use them only when necessary. Once applicators are certified, they’re required to take continuing education courses that include instruction about using rodenticides safely and only when necessary. *If DPR continues to receive reports of nontarget wildlife being adversely impacted by SGARs, further regulatory action may be considered.*

Rodenticide FAQs, p. 2.

2. Since the 2014 Regulatory Amendment, Wildlife Continue to be Harmed by Rodenticide Use in California.

Data collected from the Department of Fish and Wildlife since 2014 shows that since the adoption of the 2014 regulatory change, rodenticide contamination of wildlife in California has continued unabated, even increasing substantially for a number of both second and first generation rodenticides. In summary, the available data shows two trends.

First, contamination of wildlife from *second generation rodenticides* has remained at high levels, even increasing in many instances. This can be seen from data collected from the Department of Fish and Wildlife (“DFW”) showing the following:

- documented rodenticide poisonings from **brodifacoum** has remained high with no significant change between 2013/2104 year prior to the regulatory change and the two years subsequent;
- documented rodenticide poisonings from **bromadiolone** has increased by approximately 10% in the two year period after the regulatory change;

- documented rodenticide poisonings from **difethialone** are three times as high in the two year period after the regulatory change as prior to the change;
- documented rodenticide poisonings from **difenacoum**, have also increased in the two year period after the regulatory change.

Second, the contamination of wildlife from *first generation rodenticides* has increased considerably, with data showing:

- documented rodenticide poisonings from **diphacinone** approximately four times as high in the two year period after the regulatory change as prior to the change;
- documented rodenticide poisonings from **chlorophacinone** from two to three times as high in the two year period after the regulatory change as prior to the change;
- documented rodenticide poisonings from **warfarin** approximately four times as high in the two year period after the regulatory change as prior to the change.

See Exhibits 1-3, attached hereto and Chart Below:

Rodenticide	Pre-reg total 2013-2014 deaths from bodies tested	Year 1 post reg (2014-2015) total deaths from bodies tested	Year 2 post reg (2015-2016) total deaths from bodies tested
Brodifacoum, 2 nd gen	94	78	89
Bromadiolone, 2 nd gen	59	52	69
Difethialone, 2 nd gen	10	28	34
Difenacoum, 2 nd gen	1.5	7.4	0
Diphacinone, 1 st gen	13	50	47
Chlorophacinone, 1 st gen	4.4	11	9.6
Warfarin, 1 st gen	1.5	5.6	6.1

Third, the data also shows that wildlife may be contaminated with a variety of rodenticides, often a combination of first and second generation types. For example, virtually every mountain lion carcass examined in the year 2016 contained more than one rodenticide, with approximately half of the specimens positive for three to five different active ingredients. See Exhibit 2, attached. Similar figures exist for a host of other wildlife, from raptors including owls, hawks and peregrine falcons, to mammals including kit foxes, bobcats, coyotes and fishers. See Exhibit 3, attached. These results are corroborated by numerous other studies, including a recent WildCare study showing that over 76 percent of the wildlife they tested were positive for rodenticide exposure, meaning that many predatory wildlife are functionally living with anticoagulant toxins in their blood. See Exhibit 4, attached.

The data showing continued contamination of wildlife species despite the 2014 regulatory change constitutes new information that DPR must consider as part of its proposed decision to renew these pesticide registrations. DPR's Final Statement of Reasons adopting the 2014 regulations identifies the following comment:

By continuing to allow certified applicators to use SGAR products, these active ingredients will continue to be present in the environment and affect nontarget wildlife as well as children and pets. Not only should consumer availability of the products be restricted, but *consider prohibiting the purchase and use of all SGAR products in California by cancelling, refusing to register or renew registration of products that contain SGAR active ingredients.*

See Final Statement of Reasons and Public Report, Department of Pesticide Regulation Title 3, Amending California Code of Regulations Amend Sections 6000 and 6400, and Adopting Section 6471 Designating Brodifacoum, Bromadiolone, Difenacoum, and Difethialone (Second Generation Anticoagulant Rodenticide Products) as Restricted Materials, Attachment A, p. 2. (“Attachment A.”)

In response, DPR stated:

DPR does not intend to ban SGARs at this time. The restricted materials designation will limit the purchase and use of SGARs to certified applicators and those under their direct supervision. DPR believes limiting the use of SGARs to trained applicators will reduce unintended exposures to nontarget wildlife. SGARs are only one of a number of tools that certified applicators may use for effective rodent control.

See Attachment A, p. 1.

The submitted data indicate that DPR’s assumptions that the 2014 regulatory change making 2nd generation rodenticides restricted materials would reduce impacts on wildlife to insignificant levels is unfounded. This result was predictable given that the manner of use of the rodenticide – whether by the public or by a certified applicator - is unlikely to have any effect on whether such rodenticide ultimately ends up contaminating wildlife species that prey on the poisoned rodents. In sum, simply putting second generation anticoagulants into a restricted class (i.e., for use by pesticide companies only) has not prevented wildlife exposure and deaths. The pest control industry uses these poisons ubiquitously: when a rodent or other animal ingests these poisons and that animal in turn is consumed by a predatory animal like a hawk, owl, vulture, fox, fisher, bobcat, or mountain lion, it too can become sickened and/or die.

3. The Impacts to Wildlife from Rodenticide Use in California Requires Reevaluation.

The newest data demonstrates that first and second generation rodenticides are continuing to harm wildlife through indirect exposures, particularly through cumulative impacts caused by exposures to many types of rodenticides at the same time.

To the extent that more data are needed to determine the extent of contamination and the actual impacts of these pesticides based on an apparent increasing trend in use, those data must be collected as part of the reevaluation process. 3 Cal. Code Reg. 6222(a) provides DPR the

authority and legal obligation to fill data gaps relevant the significant risks raised by pesticide contamination, including consultation with trustee agencies such as the Department of Fish and Wildlife or the federal Fish and Wildlife Service.

These data should take into consideration the effect from the use of mixtures of two or more products in combination. 3 Cal. Code Reg. § 6192(c).

Reevaluation should also take into consider the substantial sublethal impacts that rodenticides are causing such as weakness, decreased fitness/increased vulnerability to other causes of mortality, reproductive impacts and birth defects such as shorter wings, tails, bones, and bills, neonatal transfer, internal bleeding, hemorrhaging of the heart, liver, kidney, lung, intestines, body wall, and bones, chronic anemia and mange, increased parasite and pathogen burdens, decreased resilience to environmental stressors, decreased food intake and decreased body weight. *See Exhibit 5 (fact sheet on sublethal impacts), attached.*

Reevaluation should also take into account new science published since DPR's last rodenticide evaluation process. Those include Vyas, et al. (*American Midland Naturalist*, 2017) showing that raptors are more likely to prey upon poisoned prey *See Exhibit 6*; Gabriel, et al. (*PLOS One*, 2015) showing a documented increase in mortality (57% increase) and exposure (6%) from pesticides in fishers in just the past three years, and also showing that exposure to multiple rodenticides significantly increased the likelihood of mortality from rodenticide poisoning. *See Exhibit 7.* Additionally, Poessel et al. (*Journal of Wildlife Disease* (2015) found brodifacoum and bromadiolone in very high concentrations in the livers of five coyotes and concluded that second generation anticoagulants are more likely to cause poisoning due to their persistence and accumulation in the liver. *See Exhibit 8.* Finally a recent study on bobcats shows that the primary threat to bobcat survival was diphacinone, a first-generation rodenticide. *See Exhibit 9, Serieys, et al. 2015. Anticoagulant rodenticides in urban bobcats: exposure, risk factors and potential effects based on a 16-year study. Ecotoxicology 24: 844-862.* (See also Exhibit 10, email from study author describing how prior testing was understating extent of contamination from 1st generation rodenticides.)

Reevaluation should also consider and evaluate viable alternatives to rodenticides be examined as part of this re-registration process. Such alternatives include exclusion and improved sanitation measures as well as the use of electronic rodent control devices such as The Raticator or the Rat Zapper. These products have been found to be very effective based on numerous reports we have received from schools, businesses, and other institutions that have switched from poison to traps. We also request that DPR evaluate the new, non-poisonous product ContraPest by Senestech that slows rat reproduction. This needs to be evaluated as an alternative since there have been very promising results with this compound in other states.

C. CONCLUSION

Raptors Are the Solution and Project Coyote request that DPR initiate reevaluation of rodenticide products containing the active ingredients brodifacoum, bromadiolone, difethialone, difenacoum, diphacinone, chlorphacinone and warfarin based on the continuing significant

adverse impacts to these pesticides are having on a wide range of wildlife species. As discussed above, to the extent that more data are needed to determine the extent of contamination and the actual impacts of these pesticides based on actual use in the field, that data must be collected as part of the reevaluation process.

Very Truly Yours,

A handwritten signature in blue ink that reads "Michael Graf". The signature is written in a cursive style and is placed on a light-colored rectangular background.

Michael W. Graf



Brian R. Leahy
Director

Edmund G. Brown Jr.
Governor

March 19, 2018

Mr. Michael W. Graf
Michael W. Graf Law Offices
227 Behrens Street
El Cerrito, California 94530

Dear Mr. Graf:

Thank you for your recent letter in response to the Department of Pesticide Regulation's (DPR's) *Notice of Proposed Decision to Renew Pesticide Product Registrations for 2018* (California Notice 2017-14). Your letter requests that DPR initiate reevaluation of first generation anticoagulant rodenticides (FGARs) containing the pesticide active ingredients diphacinone, chlorophacinone, and warfarin, and second generation anticoagulant rodenticides (SGARs) containing the pesticide active ingredients brodifacoum, bromadiolone, difethialone, and difenacoum.

The regulations that govern DPR's formal reevaluation process are set forth in Title 3, California Code of Regulations (CCR) sections 6220-6225. In describing the outcome of the reevaluation process, 3 CCR section 6224 provides that, "during the reevaluation, the director shall determine if the pesticide should be classified as a restricted material pursuant to Section 14004.5 of the Food and Agricultural Code; and if additional restrictions on use are necessary, or if action pursuant to Section 12824, 12825, or 12826 of the Food and Agricultural Code should be taken." Accordingly, DPR concluded its reevaluation of brodifacoum in July 2014, by designating all SGARs as California restricted materials in 3 CCR section 6400(e) and placing additional restrictions on the use of SGARs that are more stringent than federal label requirements in 3 CCR section 6471.

Pursuant to Food and Agricultural Code section 14004.5, DPR needs to find that a pesticide poses a hazard to human health or the environment to designate it as a restricted material. The restricted materials designation is not based on evidence of increased exposure rates or risk. During the brodifacoum reevaluation, DPR received sufficient evidence to demonstrate that all SGARs pose a hazard to non-target wildlife. Specifically, SGARs are intended to produce a lethal effect after a single dose. The delay between the time of the target pest's initial feeding on the SGAR and the actual mortality from the initial feeding of a lethal dose allows the target pest to keep feeding on the SGAR. Ultimately, this results in target pests containing concentrations of SGARs well beyond a lethal dose, presenting a hazard to non-target wildlife preying on the target pest. This hazard has not been demonstrated with FGARs which are designed to require multiple doses before producing a lethal effect.



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In addition, an analysis of DPR's sales and use data suggested that brodifacoum targeted for consumer-use products was the likely source of brodifacoum detections in non-target wildlife. Therefore, based on this information and the hazards to non-target wildlife posed by all SGARs, DPR determined that the restricted materials designation and additional use restrictions for all SGARs was an appropriate action to take in response to the identified concerns.

DPR is in the process of reviewing data submitted by the California Department of Fish and Wildlife and wildlife organizations to evaluate the impact of the regulations and determine if significant adverse effects to non-target wildlife continue to occur and to what extent. This review is ongoing. If data indicate that additional regulatory action is necessary to further protect non-target wildlife from anticoagulant rodenticide use, DPR will proceed with that action. It is not necessary for DPR to initiate a formal reevaluation process in order to collect and evaluate exposure data and to take regulatory action.

Since rodenticides also serve a critical role to protect public health from various diseases transmitted by rodents, DPR must carefully consider the consequences of any additional regulatory action. DPR anticipates more alternatives to anticoagulant rodenticides will be developed in the future, leading to less reliance on anticoagulant rodenticides for critical public health, agricultural, and structural uses.

Currently, DPR is evaluating an application submitted for registration by Senestech, Inc. for ContraPest, EPA Reg. No. 91601-1, a product designed to reduce the reproductive capacity of rats. Recently, DPR approved the registration of Bell Laboratories product, Rat Ice, EPA Reg. No. 12455-148, containing the active ingredient carbon dioxide (dry ice) to control rats. In the meantime, DPR will continue to accept data from other regulatory agencies, pesticide registrants, and non-profit organizations. If new information becomes available that can better quantify the exposure or risk potential of anticoagulant rodenticides to non-target wildlife, DPR will consider this information as appropriate.

DPR remains committed to effectively addressing any challenges posed by the continued use of anticoagulant rodenticides. DPR will continue to evaluate available information to determine if additional mitigation measures are needed to adequately protect non-target wildlife. If at any point DPR concludes that there are additional studies that registrants could conduct on the impact of anticoagulant rodenticide use on non-target wildlife in order to determine the need and extent of further regulatory action to address these concerns, DPR may utilize its formal reevaluation process. DPR is proceeding with the renewal of FGARs and SGARs and will not be placing them into reevaluation at this time.

Mr. Graf
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If you have any questions, please contact Ms. Margaret Reiff, Environmental Program Manager I, at <Margaret.Reiff@cdpr.ca.gov> or by telephone at 916-445-5977.

Sincerely,

Original signed by Ann M. Prichard

Ann M. Prichard, Chief
Pesticide Registration Branch
916-324-3931

cc: Ms. Margaret Reiff, Environmental Program Manager I, DPR