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Via Email and Certified U.S. Mail
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Rulemaking Petition to Regulate Crop Seeds Treated with Neonicotinoids and Other Systemic Insecticides

Dear Director Dolcini:

On behalf of the Natural Resources Defense Council, Californians for Pesticide Reform, Center for Biological Diversity, Friends of the Earth, Pesticide Action Network North America, the Xerces Society for Invertebrate Conservation, and our groups' tens of thousands of California members, we write pursuant to California Government Code § 11340.6 to request that the California Department of Pesticide Regulation (DPR) initiate rulemaking and other appropriate actions to regulate the use of neonicotinoid ("neonic")-treated crop seeds, as well as crop seeds coated with other systemic insecticides.

The use of neonic-treated seeds may represent one of the largest insecticide uses in the state of California—one that poses risks of serious harm to the state's environment and people. A recent estimate finds that neonic-treated seeds may deliver up to 512,000 pounds of neonics annually across 4,000,000 California acres, a total larger than all of the other recorded neonic uses combined. Scientific research links neonic-treated seed use to extensive and persistent soil and water pollution, losses of bees, birds, fish, mammals and other wildlife, and human health risks posed by chronic exposure to neonic-contaminated food and water. In California, DPR testing has found that neonics frequently appear in state waters at levels indicating likely ecosystem-wide damage.

Under DPR's current policy, these pesticide applications go wholly untracked and unregulated. DPR regards neonic-treated seeds and those coated with other systemic insecticides as falling outside the definition of "pesticide" under the California Food and Agricultural Code (FAC)—effectively exempting them from the state's pesticide laws.

This de facto exemption is unlawful and contrary to the letter and spirit of the FAC. Accordingly, we petition DPR to: (1) rescind its current policy and regulate and track all seeds coated with systemic insecticides sold or used in California as "pesticides;" (2) designate all neonic-treated seeds as "restricted materials" under the FAC and its implementing regulations; and (3) support development and promotion of regenerative agricultural practices that eliminate or reduce

chemical inputs, such as pesticide-treated seeds. Please note that while the discussion in Sections II-IV focuses on the use of neonics and neonic-treated seeds, the legal arguments in this Petition, and the proposed regulation in Section V apply to any seeds coated with systemic insecticides.

The basis for this Petition and our proposal are detailed below.

I. Interests of Petitioners

The Natural Resources Defense Council (NRDC) is a national non-profit environmental organization with offices in San Francisco and Santa Monica and nearly 400,000 California members and online activists. Since 1970, NRDC has worked to safeguard the earth—its people, its plants and animals, and the natural systems on which all life depends. In California, NRDC has worked for decades to protect the state's people, water, and wildlife from the threats posed by toxic pesticides. NRDC's pollinator initiative seeks to safeguard keystone pollinating species—such as California's more than 1,500 native bee species—from recent dramatic population losses driven in large part by widespread neonic use.

Californians for Pesticide Reform (CPR) is a statewide coalition of roughly 200 organizations founded in 1996 to fundamentally shift the way pesticides are used in California. CPR has built a diverse, multi-interest coalition to challenge the powerful political and economic forces opposing change. CPR approaches the need to reduce pesticide use as a critical environmental health and environmental justice issue, and we prioritize building leadership in communities living on the front lines of pesticide exposure. Much of our work focuses on holding state and local decision makers accountable for protecting human health and the environment.

The Center for Biological Diversity (the "Center") is a national, non-profit conservation organization with offices throughout the United States and Mexico that works to secure a future for all species, great and small, hovering on the brink of extinction through science, law and creative media, with a focus on protecting the lands, waters and climate that species need to survive. The Center has more than 1.7 million members and online activists that support the work to protect the vast diversity of wild animals and plants and the health and welfare of human beings, which is deeply linked to nature. The Center's Pesticides Reduction Campaign aims to secure programmatic changes in the pesticide registration process and stop toxic pesticides from getting into fish and wildlife habitats.

Friends of the Earth (FoE) is a national nonprofit environmental organization that was founded in 1969. With offices in the District of Columbia and Berkeley, California, and nearly 178,000 members and more than 1.7 million activists nationwide, FoE defends the environment and champions a healthy and just world. FoE U.S. is part of Friends of the Earth International, a global network representing more than two million activists in seventy-four countries. FoE's campaigns focus on promoting clean energy and solutions to climate change; protecting marine ecosystems and the people who live and work near them; and ensuring our food system is healthy, just, and sustainable. As part of this work, FoE is working to protect bees and other critical pollinators that are in decline globally because of the widespread use of pesticides, habitat loss, changing climate, and disease, via research, public education, grassroots campaigns, and policy advocacy.

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Pesticide Action Network North America (PANNA) is one of five regional centers worldwide, linking local and international consumer, labor, health, environment and agriculture groups into an international citizens' action network. Together, we challenge the global proliferation of pesticides, defend basic rights to health and environmental quality, and work to ensure the transition to a just and viable food system. With a base in California, PANNA has worked for over 35 years with our 22,000 members to protect workers, children, and rural communities from health hazards associated with the indiscriminate and unnecessary use of hazardous pesticides. A key strategy of this work is to support the widespread implementation of agroecological practices, including ecological pest management, that dramatically reduce the need for synthetic pesticides.

The Xerces Society for Invertebrate Conservation ("Xerces") is an international scientific nonprofit organization that seeks to prevent the extinction of threatened invertebrates and protect the crucial ecosystem services they provide. Xerces is headquartered in Portland, OR, with offices in multiple states, including one in Sacramento, CA. Xerces has 15,000 active donors, including approximately 2,000 donors in California. Native pollinators are essential to many food crops grown in California, as well as to the native plants of California's varied ecosystems. A diversity of native pollinators is paramount to maintaining the state's agricultural and natural heritage. Protection of native pollinators is critical to all Californians and to Xerces members and supporters.

II. Neonic-Treated Seeds and Their Use and Impacts in California

A. *Neonicotinoids Generally*

Neonicotinoids, commonly referred to as "neonics," are neurotoxic insecticides that permanently bind to and overstimulate nicotinic receptors in insect nerve cells, leading to collapse of the central nervous system.[1] Neonics kill insects by design, but even small, sublethal neonic exposures can ultimately cause individual or colony death by weakening critical functions—such as an insect's immune system, navigational ability, stamina, memory, and fertility.[2]

Neonics pose broad ecological concerns due to their profound invertebrate toxicity, systemic properties, and immense popularity. Neonics have made U.S. agriculture up to forty-eight times more harmful to insects since their introduction,[3] where they are most commonly applied as coatings on crop seeds.[4] These "seed treatments" are designed to be absorbed through the root system of the growing crop plant, making its tissues—leaves, roots, fruit, pollen, nectar, etc.—toxic to insects. For a typical seed treatment, only 2-5% of the neonic active ingredient enters the

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[1] *See, e.g.,* National Pesticide Information Center, *Imidacloprid: Technical Fact Sheet* (visited Sep. 15, 2020), https://bit.ly/2lQqh8W.

[2] *See* Lennard Pisa et al., *An Update of the Worldwide Integrated Assessment (WIA) on Systemic Insecticides. Part 2: Impacts on Organisms and Ecosystems*, Envtl. Sci. Pollution Research Int'l (Nov. 9, 2017), https://bit.ly/2HqqHwB [hereinafter "Worldwide Assessment Part 2"]; Daniel Kenna et al., *Pesticide Exposure Affects Flight Dynamics and Reduces Flight Endurance in Bumblebees*, Ecology and Evolution (Apr. 29, 2019), https://bit.ly/2Y2VlQo.

[3] Michael DiBartolomeis et al., *An Assessment of Acute Insecticide Toxicity Loading (AITL) of Chemical Pesticides Used on Agricultural Land in the United States*, PLoS One (Aug. 6, 2019), https://bit.ly/2Yr4Xc7 [hereinafter "DiBartolomeis 2019"].

[4] Margaret R. Douglas & John F. Tooker, *Large-Scale Deployment of Seed Treatments Has Driven Rapid Increase in Use of Neonicotinoid Insecticides and Preemptive Pest Management in U.S. Field Crops*, Environ. Sci. Technol. (Mar. 20, 2015), https://bit.ly/2VWiTqk [hereinafter "Douglas & Tooker 2015"].

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target plant.[5] The remainder stays in the soil, where it can persist—often for years—migrating easily in rain and irrigation water to contaminate new soil, plants, and water supplies. Indeed, all of the neonic active ingredients commonly used as seed treatments appear on California's "Groundwater Protection List" for pesticides designated as having the potential to pollute ground water. *See* 3 Cal. Code Regs. (C.C.R.) § 6800 (listing clothianidin, imidacloprid, and thiamethoxam). Given all of these properties and their status as the most widely used insecticides in the world,[6] neonics now broadly contaminate soil, water, and plant life across large areas of the country.[7]

A large body of scientific research connects this vast environmental contamination to tangible ecological harm. While neonics are perhaps best known as a leading cause of massive losses of honey bees and other insect pollinators,[8] neonic contamination has also been linked to the devastation of fish populations and aquatic ecosystems,[9] declines in bird and butterfly populations,[10] and birth defects in white-tailed deer.[11] As discussed below, widespread neonic exposure is also increasingly raising human health concerns. *See infra* Section II, C.

B. *Neonic-Treated Seed Use in California*

Less is known about the use of neonic-treated seeds in California than anywhere else in the country, but it may be larger in size than all other recorded neonic uses in the state combined. Until 2015, the U.S. Geological Survey (USGS) compiled national neonic use estimates that included the use of neonic-treated seeds.[12] For California, however, USGS incorporated data from the state's Pesticide Use Reporting database (PUR) only. While the PUR is often heralded as the "gold standard" for pesticide tracking in the United States, PUR data has never included neonic-treated seed use because DPR policy does not legally recognize neonic-treated seeds as

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[5] *See, e.g.*, Adam Alford & Christian Krupke, *Translocation of the Neonicotinoid Seed Treatment Clothianidin in Maize*, PLoS ONE 12(3) (Mar. 10, 2017), https://bit.ly/2xZtEgS [hereinafter "Alford & Krupke 2017"] (finding uptake of neonic active ingredient from corn seed treatments was < 2%); Robin Sur & Andreas Stork, *Uptake, Translocation and Metabolism of Imidacloprid in Plants*, Bulletin of Insectology (2003), https://bit.ly/3iN0TJt (finding uptake of imidacloprid from cotton, eggplant, potato, and rice seed treatments was <5%).

[6] *See* Douglas & Tooker 2015.

[7] *See, e.g.,* Michelle Hladik and Dana Kolpin, *First National-Scale Reconnaissance of Neonicotinoid Insecticides in Streams Across the USA*, Environmental Chemistry (Aug. 18, 2015), https://bit.ly/31Mse6o [herinafter "Hladik 2015"]; *cf.* Thomas Wood & Dave Goulson, *The Environmental Risks of Neonicotinoid Pesticides: A Review of the Evidence Post 2013*, Envtl. Sci. Pollution Research Int'l, (Jun. 7, 2017), https://bit.ly/2Hpn8T5 [hereinafter "Wood & Goulson 2017"].

[8] *See* Chiara Giorio, *An Update of the Worldwide Integrated Assessment (WIA) on Systemic Insecticides. Part 1: New Molecules, Metabolism, Fate, and Transport*, Envtl. Sci. Pollution Research Int'l (Jul. 15, 2017), https://bit.ly/2qVqciQ; Worldwide Assessment Part 2; Wood & Goulson 2017; Daniel Cressey, *Largest-ever Study of Controversial Pesticides Finds Harm to Bees*, Nature (Jun. 29, 2017), https://go.nature.com/2sgJjDk; B.A. Woodcock et al., *Country-Specific Effects of Neonicotinoid Pesticides on Honey Bees and Wild Bees*, Science (Jun. 30, 2017), https://bit.ly/2lFOAG0 ("These field results confirm that neonicotinoids negatively affect pollinator health under realistic agricultural conditions.").

[9] *See* Masumi Yamamuro et al., *Neonicotinoids Disrupt Aquatic Food Webs and Decrease Fishery Yields*, Science (Nov. 1, 2019), https://bit.ly/34rKCSG; Francisco Sanchez-Bayo, *Contamination of the Aquatic Environment with Neonicotinoids and Its Implication for Ecosystems*, Frontiers in Environmental Science (Nov. 2, 2016), https://bit.ly/2LifRHf.

[10] *See* Caspar A. Hallmann et al., *Declines in Insectivorous Birds Are Associated with High Neonicotinoid Concentrations*, Nature (Jul. 17, 2014), https://go.nature.com/2KvIwah [hereinafter "Hallmann 2014"]; Matthew L. Forister et al., *Increasing Neonicotinoid Use and the Declining Butterfly Fauna of Lowland California*, The Royal Society Publishing: Biology Letters (Aug. 1, 2016), https://bit.ly/2o5P6i0 [hereinafter "Forister 2016"].

[11] Elise Hughes Berheim et al., *Effects of Neonicotinoid Insecticides on Physiology and Reproductive Characteristics of Captive Female and Fawn White-tailed Deer*, Sci Rep. (Mar. 14, 2019), https://go.nature.com/2Q1I9Zf [hereinafter "Berheim 2019"].

[12] Pierre Mineau, *Neonicotinoids in California: Their Use and Threats to the State's Aquatic Ecosystems and Pollinators, with a Focus on Neonic-Treated Seeds*, (Sep. 2020), https://on.nrdc.org/3cl5nEK [hereinafter "Mineau 2020"], attached as Attachment A to this Petition.

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"pesticides," *see infra* Section III, B. Accordingly, no publicly available official estimate of the actual pesticidal load to California's environment from neonic-treated seeds has ever been performed.

Nonetheless, California agricultural data indicate that load may be substantial. Use of neonics on crop seeds is believed to be near ubiquitous in corn (which covers 460,000 acres in California) and cotton (258,000 acres), and widespread in wheat (420,000 acres).[13] While less is known about neonic-treated seed use on other crops, trends appear to suggest ever-increasing use.[14] Further, in California, the retirement of older pesticide chemistries may also induce a shift to greater use of neonic-treated seeds. A recent estimate by Mineau (2020) of California's total potential use (i.e., if neonic-treated seeds were used on all crops where such seeds are available) finds that neonic-treated seeds may cover as many as 4,000,000 acres, depositing 512,000 pounds of neonic active ingredients annually—well more than the 474,000 pounds of neonics applied by all other means as reported in the PUR.[15]

C. *Neonic-Treated Seeds Threaten California's Environment and People*

At minimum, the state's neonic-treated seed use likely covers hundreds of thousands (if not millions) of acres, with tens (if not hundreds) of thousands of pounds of neonic active ingredient sown into California soil every year. A large and growing body of evidence shows that even a realistic low-end estimate would result in considerable ecological harm.

Research links neonic-treated seed use with extensive environmental contamination. Studies of neonic-treated corn, canola, and wheat have documented neonic residues in planted fields as well as in surrounding soils, surface waters, and plant life—including in the pollen and nectar of adjacent wildflowers.[16] During planting, clouds of abraded "seed dust" drifting across farm fields can prove fatal to bees and other pollinators and beneficial insects.[17] After planting, rain and irrigation water carry neonic-laden runoff water through ecosystems.[18] Substantial amounts of contaminated runoff have been documented leaving farm fields several months after planting and

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[13] *See id.* at Appendix 4; U.S. Dep't of Agriculture (USDA), *2019 State Agricultural Overview: California* (accessed Jul. 9, 2020), https://bit.ly/2ZdE5v1.

[14] *See* Douglas & Tooker 2015; Mineau 2020 at 1, 4, Appendix 4.

[15] Mineau 2020 at 15.

[16] *See, e.g.*, Cristina Botías et al., *Contamination of Wild Plants Near Neonicotinoid Seed-Treated Crops, and Implications for Non-Target Insects*, Science of the Total Environment (Oct. 1, 2016), https://bit.ly/2EdJG9i ("Our results suggest that neonicotinoid seed-dressings lead to widespread contamination of the foliage of field margin plants"); Bonmatin et al., *Environmental Fate and Exposure; Neonicotinoids and Fipronil* (Aug. 7, 2014), https://bit.ly/35iN3HX [hereinafter "Bonmatin 2014"] (summarizing evidence of neonics' long persistence in soils and describing multiple neonic exposure routes); Schaafsma et al., *Neonicotinoid Insecticide Residues in Surface Water and Soil Associated with Commercial Maize (Corn) Fields in Southwestern Ontario*, PLoS One (Feb. 24, 2015), https://bit.ly/32wMJqt [hereinafter "Schaafsma 2015"]; Main et al., *Widespread Use and Frequent Detection of Neonicotinoid Insecticides in Wetlands of Canada's Prairie Pothole Region*, PLoS One (Mar. 26, 2014), https://bit.ly/2CLoom3.

[17] Travis A. Grout et al., *Neonicotinoid Insecticides in New York State: Economic Benefits and Risk to Pollinators*, Cornell University 210-211 (Jun. 2020), https://bit.ly/2Ei7Z9Y [hereinafter "Grout 2020"] (discussing risks and harms to pollinators from neonic-treated seed dust).

[18] *See, e.g.*, Jesse Radolinski et al., *Plants Mediate Precipitation-Driven Transport of a Neonicotinoid Pesticide*, Chemosphere (May 2019), https://bit.ly/2OmbfT4 (documenting "that neonicotinoids can be transported from seed coatings both above and through the soil profile, which may enable migration into surrounding ecosystems."); Sara A. Whiting & Michael Lydy, *A Site-Specific Ecological Risk Assessment for Corn-Associated Insecticides* (Dec. 30, 2014), https://bit.ly/3elHw7i [hereinafter "Whiting & Lydy 2014"].

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traveling considerable distances into wetlands and other water supplies.[19] Because neonics can persist in soil and plants for years, neonics often accumulate in areas of repeated use and leave long-lasting legacy contamination.[20] Indeed, in areas where neonic-treated seeds are the predominant neonic use, neonic pollution is often described as "ubiquitous"—with the chemicals appearing in fields with no history of neonic use as well as local water supplies.[21]

Neonics' potent invertebrate toxicity translates this pervasive contamination into substantial harm. Neonic-treated seeds have driven the dramatic increase in neonic use generally in the last several decades,[22] which has made U.S. agriculture up to forty-eight times more harmful to insect life.[23] This increase has been linked with declines in insect populations—including California pollinators[24]—which ripple through ecosystems. For example, in the Netherlands, researchers linked declining populations of insect-eating birds to the introduction of extremely low neonic levels in water (only 20 parts per *trillion*).[25] In Japan, researchers likewise connected the sudden and dramatic collapse of a fishery to the decimation of aquatic invertebrate populations from the introduction of neonics in nearby agriculture.[26] And here in the United States, research now links increases in neonic use in the mid-2000s with significant declines in grassland and insect-eating birds.[27]

Neonic-treated seeds can also harm wildlife directly. Several studies link neonic-treated seed use with harms to pollinator populations and pollinator health,[28] and a recent Cornell University

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[19] Whiting & Lydy 2014; Sara Whiting et al., *A Multi-Year Field Study to Evaluate the Environmental Fate and Agronomic Effects of Insecticide Mixtures*, Science of the Total Environment (Nov. 1, 2014), https://bit.ly/2ZNXp2p; Jesse Miles et al., *Effects of Clothianidin on Aquatic Communities: Evaluating the Impacts of Lethal and Sublethal Exposure to Neonicotinoids*, PLoS One (Mar. 23, 2017) https://bit.ly/3jsaciH, *with 2018 correction* Miles et al., PLoS ONE, https://bit.ly/2ZOSVZb.

[20] Bonmatin 2014 ("the half-lives of neonicotinoids in soils can exceed 1,000 days"); Main et al., *Reduced Species Richness of Native Bees in Field Margins Associated with Neonicotinoid Concentrations in Non-Target Soils*, Agriculture, Ecosystems & Environment (Jan. 1, 2020) (detecting neonics in soils adjacent to both fields with historic neonic use and those without historic neonic use; higher soil concentrations were correlated with lower native bee species richness), http://bit.ly/2OhMB6W [hereinafter "Main 2020"]; Arthur Schaafsma et al., *Neonicotinoid Insecticide Residues in Surface Water and Soil Associated with Commercial Maize (Corn) Fields in Southwestern Ontario*, Plos ONE (Feb. 24, 2015), https://bit.ly/2PArexx (measuring pre-plant neonic levels as high as 7.5 μg/L in ditches outside a seeded field and 16.5 μg/L in puddles outside Ontario corn fields, indicating contamination from the previous use of seed treatments in the preceding growing season).

[21] Main 2020; Kathryn Klarich et al., *Occurrence of Neonicotinoid Insecticides in Finished Drinking Water and Fate During Drinking Water Treatment*, Environmental Science and Technology Letters (Apr. 2017), https://bit.ly/2PMRunk; Tamanna Sultana et al., *Neonicotinoid Pesticides in Drinking Water in Agricultural Regions in Southern Ontario, Canada*, Chemosphere (Jul. 2018), http://bit.ly/2JZawXI.

[22] Douglas & Tooker 2015.

[23] *See* DiBartolomeis 2019; Margaret Douglas et al., *County-level Analysis Reveals a Rapidly Shifting Landscape of Insecticide Hazard to Honey Bees (Apis Mellifera) on US Farmland*, Scientific Reports (Jan. 21, 2020), https://go.nature.com/2SKhjHP.

[24] *See* Forister 2016.

[25] Hallmann 2014.

[26] Masumi Yamamuro et al., *Neonicotinoids Disrupt Aquatic Food Webs and Decrease Fishery Yields*, Science (Nov. 1, 2019), https://bit.ly/34rKCSG.

[27] Yijia Li et al., *Neonicotinoids and Decline in Bird Biodiversity in the United States*, Nature Sustainability (Aug. 10, 2020), https://go.nature.com/2Yb6cub.

[28] *See, e,g.*, Main 2020; N. Tsvetkov et al., *Chronic Exposure to Neonicotinoids Reduces Honey Bee Health Near Corn Crops*, Science (Jun. 30, 2017), https://bit.ly/3hx9EH0; Ben Woodcock et al., *Impacts of Neonicotinoid Use on Long-Term Population Changes in Wild Bees in England*, Nature Communications (Aug. 16, 2016), https://go.nature.com/3hxAFKi; Maj Rundlöf, *Seed Coating with a Neonicotinoid Insecticide Negatively Affects Wild Bees*, Nature (Apr. 22, 2015), https://go.nature.com/2CYNo9Q.

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review of roughly a hundred exposure studies finds neonic-treated field crop seeds pose "substantial" risks to bees.[29]

The direct impacts reach beyond the insect world. In the planting of field crops, piles of neonic-treated seeds are left out in the open or the seeds are planted shallowly enough for birds to eat.[30] Eating just one such seed is enough to kill some songbirds.[31] And at nonlethal doses, neonic-treated seed ingestion can damage birds' immune and reproductive systems, cause rapid weight loss, and impair navigation and migration ability—all reducing the likelihood of their surviving and reproducing in the wild.[32]

Neonic-treated seeds can also harm mammals—either through direct ingestion or contamination of food and water sources. For example, neonic exposures have been linked with birth defects in white-tailed deer—including decreased body and organ weight, decreased jawbone length, and higher death rates for fawns.[33]

In California, neonic-treated seeds pose substantial risks to bees and other insect pollinators and are likely major contributors to neonic residues appearing in state waters at levels expected to cause ecosystem-wide damage.[34] In recent DPR testing, the neonic imidacloprid appeared in more than 90% of Southern and Central California agricultural surface water samples, with all detections exceeding U.S. Environmental Protection Agency's (U.S. EPA) chronic "benchmark" for harm to aquatic ecosystems.[35] Other state and federal testing also reveal this benchmark commonly exceeded by ten-to-one-hundred fold.[36] For example, in tributaries to the Salinas River in Monterey County, every sample over an eight-year period contained imidacloprid ten-fold above this ecological damage threshold.[37]

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[29] Grout 2020 at 237-38.

[30] Charlotte Roy et al., *Neonicotinoids on the Landscape: Evaluating Avian Exposure to Treated Seeds in Agricultural Landscapes*, Minnesota Department of Natural Resources & Wildlife Restoration, https://bit.ly/337ENZK (documenting exposed neonic-treated seed in 25 percent of 48 fields sampled, and observing that ring-necked pheasants, Canada geese, American crows, various species of sparrows, and blackbirds, as well as white-tailed deer, rodents, rabbits, and raccoons eating the seeds).

[31] Pierre Mineau & Cynthia Palmer, *The Impact of the Nation's Most Widely Used Insecticides on Birds*, American Bird Conservancy, 3 (Mar. 2013), https://bit.ly/1jmQ7u0.

[32] Ana Lopez-Antia et al., *Imidacloprid-Treated Seed Ingestion Has Lethal Effect on Adult Partridges and Reduces Both Breeding Investment and Offspring Immunity*, Environmental Research (Jan. 2015), https://bit.ly/2kwUdWS; Margaret L. Eng et al., *A Neonicotinoid Insecticide Reduces Fueling and Delays Migration in Songbirds*, Science (Sep. 2019), https://bit.ly/2kGS1MA; Margaret L. Eng et al., *Imidacloprid and Chlorpyrifos Insecticides Impair Migratory Ability in a Seed-Eating Songbird*, Scientific Reports (Nov. 2017), https://go.nature.com/2QEWHA6.

[33] E. H. Berheim et al., *Effects of Neonicotinoid Insecticides on Physiology and Reproductive Characteristics of Captive Female and Fawn White-Tailed Deer*, Scientific Reports (Mar. 14, 2019), https://go.nature.com/2Q1I9Zf. Surprisingly, in the study, deer in the control group—i.e., those purposely not exposed to neonics—still contained detectable levels of neonics in their organs, demonstrating the ubiquity of neonic contamination real world.

[34] Mineau 2020 at 1, 16-26.

[35] *See* Xin Deng, *Surface Water Monitoring for Pesticides in Agricultural Areas in the Central Coast and Southern California, 2018*, DPR (May 28, 2019), https://bit.ly/2n8Epeg (finding imidacloprid in 94% of all samples); Robert Budd, *Urban monitoring in Southern California watersheds FY 2017-2018*, DPR (Mar. 1, 2019), https://bit.ly/2nY9TUq (finding imidacloprid in 92% of all samples); *U.S. EPA, Aquatic Life Benchmarks and Ecological Risk Assessments for Registered Pesticides*; Pierre Mineau, *Impacts of Neonics in New York Water* (2019), https://on.nrdc.org/2lXsO0O (finding neonics, on the basis of similar water testing results, were likely causing "ecosystem-wide damage" in New York).

[36] Mineau 2020 at 1, 21.

[37] *Id.* at 1, 23-24.

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Concerningly, existing water testing data provide only a partial picture of neonic contamination. In contrast to sampling for imidacloprid, DPR's testing for other neonic chemicals has been fragmentary. Yet the limited data available for clothianidin and thiamethoxam—two neonic chemicals mainly used as seed treatments—suggest that these chemicals are "major contaminants of agricultural areas of California," likely even in greater amounts than imidacloprid in many regions.[38]

This contamination in California may also have repercussions for the health of Californians. Research now indicates that neonic exposures may lead to elevated risk of developmental or neurological damage—particularly in infants and young children—including potential thyroid disruption and malformations of the developing heart and brain.[39] These studies are particularly worrying given the pervasiveness of exposure—monitoring by the U.S. Centers for Disease Control and Prevention indicates that *roughly half* of the U.S. general population is exposed to neonics on a regular basis.[40] Contaminated food and water are likely the most common exposure sources. Where neonics contaminate drinking water sources, conventional chlorination treatment does not remove them without additional filtration.[41] Fruits, vegetables, and processed foods—including baby food—frequently contain neonics too,[42] which, because they permeate treated foods, cannot be washed off.

Without data on the scope of neonic-treated seed use in California, it is difficult to quantify their full impact on California's environment and its people. However, given current neonic-treated seed use patterns and their persistence, mobility, known environmental harms, and potential human health risks, their full impact is likely large, damaging, and widespread.

D. *Most Neonic-Treated Seeds Fail to Provide Monetary Benefits*

The vast majority of efficacy research on neonic-treated seeds has focused on corn and soybean production, showing that neonics provide little to no monetary benefits to farmers.[43] For example, a recent Cornell University review of hundreds of side-by-side North American field trials found that neonic-treated seeds produced "substantial" risks to pollinators, but "no overall

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[38] *Id.* at 25.

[39] Comment Submitted by Gary D. Hammer, President, Endocrine Society to EPA Regarding Its Proposed Interim Decisions for Several Neonicotinoid Pesticides (May 6, 2020), https://bit.ly/3cM0CU7; Andria Cimino et al., *Effects of Neonicotinoid Pesticide Exposure on Human Health: A Systematic Review*, Envtl. Health Perspectives (Feb. 1, 2017), https://bit.ly/2NVA1LR [hereinafter "Cimino 2017"].

[40] Maria Ospina et al., *Exposure to Neonicotinoid Insecticides in the U.S. General Population: Data from the 2015–2016 National Health and Nutrition Examination Survey*, Environmental Research (Sep. 2019), https://bit.ly/2YKLjmX; *see also* Go Ichikawa et al., *LC-ESI/MS/MS Analysis of Neonicotinoids in Urine of Very Low Birth Weight Infants at Birth*, PLoS One (Jul. 1, 2019), https://bit.ly/2nF2DNi (finding neonics in the urine of newborn babies, indicating that neonics pass from pregnant mother to developing fetus).

[41] *See* Kathryn L. Klarich et al., *Occurrence of Neonicotinoid Insecticides in Finished Drinking Water and Fate During Drinking Water Treatment*, Envtl. Sci. and Tech. Letters (Apr. 2017), https://bit.ly/2PMRunk.

[42] *See, e.g.*, Olga Naidenko, *Neonic Pesticides: Banned in Europe, Common on U.S. Produce, Lethal to Bees*, Envt'l Working Group (Jul. 26, 2018), https://bit.ly/2EejbSx; Friends of the Earth, *Toxic Secret: Pesticides Uncovered in Store Brand Cereal, Beans, Produce*, http://bit.ly/2IIE26V (visited Oct. 17, 2019).

[43] *See, e.g.*, Spyridon Mourtzinis et al., *Neonicotinoid Seed Treatments of Soybean Provide Negligible Benefits to US Farmers*, Sci. Reports (Sep. 9, 2019), https://go.nature.com/2p5leCP; Christian Krupke et al., *Planting of Neonicotinoid-Treated Maize Poses Risks for Honey Bees and Other Non-Target Organisms Over a Wide Area Without Consistent Crop Yield Benefit*, J. of Applied Ecol. (May 22, 2017), https://bit.ly/36aMZtD; Alford & Krupke 2017.

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net income benefit" compared to untreated seeds.[44] An extensive field study in Canada published just weeks later confirmed similar results.[45]

Despite their questionable value, the use of neonic-treated seeds is often near total in conventional field crops like corn and cotton.[46] This apparent market failure is, in part, explained by increased consolidation of seed and pesticide producers. For corn, farmers shopping for popular corn seed product lines generally have no choice but to buy neonic-treated seeds.[47] Further, those providing agronomic advice on the wisdom of treated seed use increasingly have ties to seed and chemical manufacturers.[48]

These same market pressures exist in California. And given research showing neonic-treated seeds' limited efficacy outside of the first few weeks after planting,[49] there is a concern that increasing neonic-treated seed use in California merely adds to other existing pesticide uses.

E. *DPR's Limited Consideration of Neonic-Treated Seeds*

In California, DPR has largely overlooked the likely impacts of neonic-treated seeds on the state's environment. In July 2018, DPR released a determination of neonics' risks to bees, finding neonic-treated seeds present "low risk to honey bee colonies" because little of their active ingredient ends up in the pollen and nectar of the target crop.[50] That conclusion, however, ignores the reality that the neonic active ingredients migrate *elsewhere* through the environment—including soil, water, and the pollen and nectar of adjacent wildflowers, which may contain higher neonic levels than those of the target crops.[51] Several Petitioners identified these concerns in an October 17, 2019, letter to DPR.[52] However, DPR's draft proposal to

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[44] Grout 2020 at 236.

[45] Jocelyn L. Smith et al., *Quantifying Early-Season Pest Injury and Yield Protection of Insecticide Seed Treatments in Corn and Soybean Production in Ontario, Canada*, Journal of Economic Entomology (Jul. 11, 2020), https://bit.ly/31BoMMB.

[46] Mineau 2020 at Appendix 4.

[47] *See* John F. Tooker, *Why It's Time to Curb Widespread Use of Neonicotinoid Pesticides*, The Ecologist (Jun. 27, 2018), https://bit.ly/30mQV9P.

[48] Major seed and chemical producers like Monsanto (now owned by Bayer) and Pioneer (now owned by Corteva Agriscience, formerly a unit of DowDuPont) have sales representatives, advisers, and licensed seed dealers located across the country. *See, e.g.*, Monsanto US Ag Products, "Rep & Dealer Locator," https://bit.ly/2k1BlPD (accessed Aug. 9, 2020). Pioneer, "Find Your Local Pioneer Team," https://bit.ly/2m20A56 (accessed Aug. 9, 2020).

[49] *See, e.g.*, Alford & Krupke 2017 (two-year study of neonic residues in corn planting with neonic-treated seed finding "clothianidin concentrations followed an exponential decay pattern with initially high values followed by a rapid decrease within the first ~20 days post planting").

[50] DPR, *California Neonicotinoid Risk Determination*, 8 (Jul. 2018), https://bit.ly/33HaU6d [hereinafter "Risk Determination"].

[51] Cristina Botías et al. *Neonicotinoid Residues in Wildflowers, a Potential Route of Chronic Exposure for Bees*, Env. Sci. Technol. (Oct. 6, 2015), https://bit.ly/3mhwTYm.

[52] Letter from NRDC, Center for Biological Diversity, Xerces, and FoE to DPR entitled "Concerns Regarding Reevaluation of Neonicotinoid Insecticides and Anticipated Rulemaking," (Oct. 17, 2019), attached as Attachment B to this Petition.

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mitigate risks to bees from neonic use, released July 24, 2020, does not address the use of or even mention neonic-treated seeds.[53]

III. Current Legal Status of Neonic-Treated Seeds

Pesticides in California are governed by both federal and state law. Under federal law, U.S. EPA considers neonic-seeds to be pesticides. U.S. EPA has promulgated an exemption that it currently applies to neonic-treated seeds (though Petitioners believe U.S. EPA is wrong to do so). Under California law, no such exemption exists. Nonetheless, DPR currently considers neonic-treated seeds to fall outside the scope of California's pesticide laws.

A. *U.S. EPA Considers Neonic-Treated Seeds to Be Pesticides, But Exempts Them from Regulation*

Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. §§ 136-136y, all pesticides sold or distributed in the United States must first be registered with the U.S. EPA. FIFRA defines "pesticide" broadly as including "any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest." 7 U.S.C. § 136(u).

U.S. EPA may exempt a pesticide from FIFRA's requirements if it determines that regulation of the pesticide is unnecessary "to carry out [FIFRA's] purposes," such as the prevention of unreasonable environmental harm. 7 U.S.C. § 136w(b). Pursuant to this authority, U.S. EPA has issued regulations exempting certain pesticide-treated articles, provided they meet two criteria: (1) the pesticide used to treat the article is registered by U.S. EPA; and (2) the "sole purpose" of the treatment is to protect the article itself. *See* 40 C.F.R. § 152.25(a).[54]

U.S. EPA applies this "treated article" exemption to neonic-treated seeds. In a 2003 "harmonization document" released in conjunction with Canada's Pesticide Management Regulatory Agency, U.S. EPA explained that pesticide-treated crop seeds—which include those treated with neonics—constitute "pesticides" under FIFRA.[55] Nonetheless, U.S. EPA currently exempts these seeds as "treated articles," based on the presumption that "the pesticidal protection imparted to the treated seed does not extend beyond the seed itself."[56] Accordingly, U.S. EPA does not register or otherwise directly regulate pesticide-treated seeds.

U.S. EPA's exemption for neonic-treated seeds has been controversial because their pesticidal effects target growing crop plants and the surrounding soil—not simply the seeds themselves—and bleed well beyond field boundaries. *See infra* Section IV, B. Regardless, U.S. EPA effectively reaffirmed this exemption in its recent proposed interim registration review decisions

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[53] *See generally*, DPR, *Draft Text of Proposed Regulations to Mitigate Risks to Pollinators from Neonicotinoid Exposures*, https://bit.ly/2EBlWQ8 [hereinafter "Draft Neonic Regulations"] (visited Aug. 26, 2020).

[54] EPA, *Applicability of the Treated Articles Exemption to Antimicrobial Pesticides*, 2 (Mar. 6, 2000) (emphasis added), https://bit.ly/2LzsY7X.

[55] EPA, *Harmonization of Regulation of Pesticide Seed Treatment in Canada and the United States*, § 2.1 (Apr. 11, 2003), https://bit.ly/2Au0tGI, [hereinafter "EPA Harmonization Document"] ("For the purposes of FIFRA, pesticide-treated seeds are considered to be pesticides themselves because they are a mixture of substances that are intended to prevent, destroy, repel or mitigate a pest.").

[56] *Id.* at § 2.1. Petitioners disagree with U.S. EPA's conclusion that this exemption applies.

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for all neonic active ingredients by not proposing a registration requirement or any other direct regulation of neonic-treated seeds.[57]

B. *DPR Maintains That Neonic-Treated Seeds Fall Wholly Outside Its Authority*

The California Food and Agriculture Code (FAC) grants DPR regulatory authority over the sale or use of pesticides in California. *See generally* FAC Divs. 6-7. The FAC definition of "pesticide" mirrors that of FIFRA. *Compare* FAC § 12753 (defining "pesticide" as "[a]ny substance, or mixture of substances which is intended to be used for . . . preventing, destroying, repelling, or mitigating any pest") *with* 7 U.S.C. § 136(u) (defining "pesticide" as "any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest"). As the definitions are materially identical, the FAC definition of "pesticide" encompasses neonic-treated seeds, just as the federal definition does.

DPR, however, maintains an interpretation of "pesticide" that excludes certain pesticide-treated articles, effectively reading the federal treated article exemption into California's statutory definition. DPR has never formally promulgated this interpretation, and has explicitly declined to promulgate a "treated article" exemption paralleling the federal exemption.[58] In support of its statutory interpretation, DPR has identified language contained in its 1999 initial statement of reasons ("1999 ISOR") for the rulemaking package for 3 C.C.R. § 6147, which contains the list of pesticides exempted from FAC pesticide regulation.[59] In email correspondence with petitioner NRDC, DPR confirmed that its reasoning for reading the statute as exempting certain pesticide-treated articles also applies to pesticide-treated seeds (such as neonic-treated seeds), and that the 1999 ISOR is DPR's only written policy regarding the legal status of such seeds under the FAC's pesticide provisions.[60]

The 1999 ISOR asserts that, in DPR's view, items like "[pesticide-]treated paint or wood" and other items "to which pesticides may be applied or added to provide preservation," such as "textiles, plastics, paper, adhesives, and coatings," are not "intended to be used to control pests" and therefore fall outside the FAC's definition of "pesticide." 1999 ISOR at 3. The document provides an important caveat to this reading of the statute:

> [I]f the manufacturer of an article to which a pesticide has been added makes implied or explicit claims that the treated article itself can be used to prevent, repel,

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[57] All proposed interim registration review decisions are available at: EPA, *Proposed Interim Registration Review Decision for Neonicotinoids*, https://bit.ly/361DMp3 (visited May 15, 2020). In them, EPA identifies risks of concern for use of neonic-treated seeds, but is unable to provide effective mitigation because it preserves the treated article exemption. For example, EPA identifies risks regarding the way neonic-treated seed is commonly planted and disposed of. Yet, because it exercises no direct regulatory control over treated seed use, it provides no enforceable restrictions, opting instead for advisory seed bag labeling likely to be ignored by farmers. *See* Lucas Rhoads & Daniel Raichel, *Comments on the Proposed Interim Registration Review Decisions for the Neonicotinoid Insecticide Class*, NRDC, 30-34 (May 4, 2020), https://on.nrdc.org/2TyHdyD.

[58] DPR, *Regarding the Exemption from California's Regulatory Requirements, Pesticides that Are Exempt from Federal Requirements Pursuant to FIFRA Section 25(b)(2), Initial Statement of Reasons and Public Report*, 3 (1999), attached as Attachment C to this Petition.

[59] Correspondence between Daniel Rubin, Chief Counsel, DPR, and Daniel Raichel, Staff Attorney, Natural Resources Defense Council between Mar. 16, 2020, and Mar. 30, 2020, attached as Attachment D to this Petition [hereinafter "DPR/NRDC 2020 Email Correspondence"]. The accompanying electronic attachment referenced in the email chain is the 1999 ISOR, provided here as Attachment C.

[60] *Id.*

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or destroy pests, then the treated article is considered to be a "pesticide" and must be registered with DPR.

Id. The 1999 ISOR contains no explicit reference to pesticide-treated seeds or any other agricultural product. Further, no mention of pesticide-treated seeds or "treated articles" appears in the FAC or DPR's implementing regulations. *See generally* 3 C.C.R. § 6147. Nonetheless, DPR's lack of regulation of pesticide-treated seeds and DPR's correspondence on the topic confirm that DPR maintains a policy of excluding pesticide-treated seeds from the statutory definition of "pesticide."

C. *DPR's Treatment of Pesticide-Treated Seeds Creates a Significant Gap in Its Regulation of Pesticides*

Neonics are one of the most popular pesticide classes in the world,[61] and neonic-treated seeds may be the dominant use of neonics in California, as they are elsewhere in the United States. *See supra*, Section II, B. Accordingly, the practical effect of DPR's policy regarding neonic-treated seeds is to excuse what may be one of the single largest pesticide uses in the state from all forms of tracking or regulation.

Neonics are not alone as seed treatments—fungicides, nematicides, other insecticides, and herbicides all also commonly appear as crop seed coatings, and often on the same seeds.[62] As these treatments grow in popularity, DPR policy prevents the agency from addressing, or even understanding, their use and environmental impacts, both now and in the future. Indeed, under the agency's current policy, DPR would be powerless to prevent any pesticide—no matter how dangerous—from being planted into California soil, provided it comes in on a seed treated in a different state.[63]

DPR appears to believe that the FAC compels this result. However, as discussed below, DPR's policy regarding neonic-treated seed finds no support in statute, contradicts DPR's own reasoning in the 1999 ISOR, and is antithetical to DPR's broad authority and duty to protect Californians and their environment from harmful pesticide use.

IV. DPR Must Regulate Neonic-Treated Seeds as Pesticides

The FAC requires that DPR regulate all pesticides sold and used in California, unless explicitly exempted by DPR regulation. Neonic-treated seeds fit squarely within the definition of "pesticide" under California law, and none of the limited exemptions from regulation apply.

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[61] Chris Bass et al., *The Global Status of Insect Resistance to Neonicotinoid Insecticides*, Pesticide Biochemistry and Physiology (Jun. 2015), https://bit.ly/3gMxNcj (combined, neonics had "a market share of more than 25% of total global insecticide sales" in 2014).

[62] *See, e.g.*, Syngenta Crop Protection, Inc., Brochure for Cruiser Maxx Cereals Seed Treatments (2008), https://www.syngenta-us.com/prodrender/imagehandler.ashx?ImID=29885B07-9834-4FE3-89A7-09DD98A0FCEE&fTy=0&et=8 ("By combining Cruiser insecticide with two fungicides in one convenient formulation, growers can protect against pest without mixing several products together.").

[63] The University of California State Integrated Pest Management Program (UC IPM) recognizes this loophole and provides advice on how to exploit it. UC IPM, *How to Manage Pests: UC Pest Management Guidelines – Cucurbits* (visited Sep. 22, 2020), https://bit.ly/3mLanHp ("Farmore FI400 [a thiamethoxam seed treatment] is not labeled for use in California, but seed treated in and obtained from another state can be legally used in California even for a chemical not registered on cucurbits in California. Contact your retail seed dealer for information and availability.").

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DPR must therefore subject these seeds to the same registration and safety requirements as any other pesticide and ensure that their use does not create hazards to public health or the environment.

A. *DPR's Authority and Duty to Regulate Pesticide Use*

The FAC charges DPR with controlling the registration, sale, and use of pesticides in California in order "[t]o provide for [their] proper, safe, and efficient use" and "[t]o protect the environment from environmentally harmful pesticides by prohibiting, regulating, or ensuring proper stewardship of those pesticides." FAC § 11501. It is unlawful to manufacture, sell, possess, or use any pesticide that has not first been registered with DPR. FAC §§ 12811, 12991-95. Further, as the state agency responsible for registration, DPR must ensure that registered pesticides are used in a manner that protects public health and the environment and that unregistered pesticide use does not occur. *See, e.g.,* FAC §§ 11501, 12995.

DPR may excuse a pesticide from the requirements of California's pesticide laws only "by regulation," only if the pesticide is exempt under FIFRA, and only after DPR: (1) "individually evaluates" the pesticide and concurs with U.S. EPA's exemption decision; and (2) excludes from the exempting regulation any requirements necessary to protect the public health or the environment. FAC § 12803. Even afterwards, DPR retains the authority to regulate the exempted pesticide whether it is registered or not. *Id.*

Additionally, DPR must regulate and control the use of agricultural chemicals that create hazards to domestic animals (including honeybees), the environment, or farmworker and public health as "restricted materials." FAC §§ 14001, 14004.5. DPR must likewise regulate or prohibit the use of any "environmentally harmful materials," and in doing so "shall take whatever steps [DPR] deems necessary to protect the environment." *Id.* § 14102. Further, DPR must "endeavor to eliminate from use in the state any pesticide that endangers the agricultural or nonagricultural environment, is not beneficial for the purposes for which it is sold, or is misrepresented." FAC § 12824. Finally, with respect to neonic pesticides in particular, DPR must "adopt any control measures necessary to protect pollinator health." FAC § 12838.

B. *Neonic-Treated Seeds Are Pesticides Under California Law*

Neonic-treated seeds constitute "pesticides" as defined by the FAC. Under FIFRA's materially identical definition of "pesticide," *compare* FAC § 12753(b), *with* 7 U.S.C. § 136(u), the U.S. EPA has concluded that "pesticide-treated seeds are considered to be pesticides themselves because they are a mixture of substances that are intended to prevent, destroy, repel or mitigate a pest."[64] This analysis applies with full force to the FAC definition.

The FAC requires the registration of mixtures of neonics with otherwise non-pesticidal goods. *See* FAC §§ 12753(b) (defining pesticide as including any "mixture of substances which is intended . . . for preventing, destroying, repelling, or mitigating any pest"); 12993 (prohibiting manufacture, delivery, or sale of any "mixture of substances that is represented to be a

[64] EPA Harmonization Document at § 2.1.

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pesticide"); 12995 (prohibiting use or possession of unregistered pesticides). DPR recognizes this through its registration of pesticide-impregnated products, including neonic-impregnated fertilizers.[65] Neonic-treated seeds fall into this category—whether the neonic active ingredient is applied to a seed or to another agricultural commodity, the pesticidal purpose is the same. The resulting mixture is, and must be regulated as, a "pesticide."

DPR's current policy and practice excludes neonic-treated seeds from FAC regulation as "treated articles" under the theory that such seeds are treated solely for the protection of the seeds themselves and "not intended to be used to control pests." *See* 1999 ISOR.[66] This theory is false. DPR policy requires that exempt treated articles must be treated "solely to protect the article/substance itself" and not intended or advertised for a broader pesticidal purpose.[67] However, neonic coatings added to seeds are designed to be systemically absorbed into the later-emerging seedlings and crop plants to repel or kill pest insects. In other words, neonic-treated seeds are the intended vehicles for delivering pesticidal impacts extending beyond the seeds themselves. Further, they are advertised for this purpose.

For example, promotional materials for Gaucho® 600 Flowable—a neonic seed treatment product—state that it "provides unmatched protection against the worst insects, acting both on contact to protect the roots and systemically to protect the plant."[68] This is the same manner the neonic active ingredient would be intended to work were it applied as a soil application from a DPR-registered product.[69] Similarly, Syngenta's brochure for its neonic-containing Cruiser® line of neonic seed treatment products states that those products provide "convenient, seed-delivered protection" against pest insects, indicating the seeds are devices for delivering an intended pesticidal effect.[70] When seeds are coated in these pesticides, the resulting mixture is a pesticide intended to kill insects throughout the early life of the plant.

These advertisements illustrate that the fundamental nature of pesticide-treated seeds is vastly different than the examples of "treated articles" discussed in the 1999 ISOR—such as treated paint, wood, textiles, plastics, paper, adhesives, and coatings. Unlike a fencepost or a doormat, seeds are living items that grow into something else—specifically, agricultural plants that are

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[65] *Id.*; *see also, e.g.,* DPR, Product Information Report for Signature Brand Fertilizer with 0.2% Merit (Reg. no. 432- 1349-AA- 34704), *available at* https://bit.ly/2ZPcjow.

[66] DPR/NRDC 2020 Email Correspondence.

[67] DPR, Letter to Pesticide Product Registrants and Stakeholders Regarding Registration Requirements for Products Made from Pesticide Impregnated Materials and Bearing Pesticide Claims, CA Notice California Notice 2015-13 (Dec. 10, 2015), https://bit.ly/3f1xpFc [hereinafter "DPR Impregnated Materials Guidance"] (emphasis in original); *see* 1999 ISOR at 3.

[68] Bayer Crop Science, *Gaucho 600 Seed Treatment*, (visited Jun. 3, 2020), https://bit.ly/307hAbV [hereinafter "Gaucho 600 Seed Treatment Website"].

[69] *See, e.g.,* Syngenta United States, *Platinum Insecticide*, (visited August 12, 2020), https://bit.ly/2XYlLVU ("With a wide variety of soil application methods, Platinum® insecticide offers residual control of sucking and chewing insects in vegetables, potatoes and fruit. Its highly systemic activity results in rapid root uptake and long residual control."); DPR, Product Information Report for Platinum Insecticide, (visited Aug. 12, 2020), https://bit.ly/30RrEGk (stating that registration is active and identifying sole active ingredient is the neonic thiamethoxam).

[70] Syngenta, *Cereals Seed Treatment Portfolio Brochure*, 7 (2012), *available at* https://bit.ly/3mxHIFO, [hereinafter "Syngenta Cruiser Brochure 2012"]. *See also* BASF United States, *Poncho® 600 Seed Treatment* (visited Sep. 15, 2020), https://bit.ly/3c24Mrg ("Poncho® 600 seed treatment provides broad-spectrum efficacy against a range of soil and plant pests"); BASF, *Poncho® Votivo®* (visited Sep. 16, 2020), https://bit.ly/3hv7sPu (stating the product "contains a systemic agent that is absorbed by roots immediately, so pests do not get the opportunity to strike"); Winfield United, Sale Sheet for Resonate® 480 ST (2017), https://bit.ly/32yzEMY ("The active ingredient imidacloprid gives long-lasting protection during critical early-season crop development").

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commonly targets of registered pesticide use. And while the purpose of treated paint or wood may be "to paint buildings or build a deck," 1999 ISOR at 3, a key purpose of a neonic-treated seed is to deliver a pesticidal impact.[71] Indeed, the 1999 ISOR and other DPR policy and guidance provide that pesticide-treated products advertised for their ability to prevent, repel, or destroy pests are "pesticides" and "must be registered with DPR." 1999 ISOR at 3.[72] Neonic-treated seeds are extensively promoted in this fashion—with treatment products and seeds often marketed and sold together as a single seed-and-pesticide package, advertising the seed as the intended delivery vehicle for the desired pesticidal impact.[73] Accordingly, neonic-treated seeds constitute "pesticides" under the FAC and must be duly registered.

Importantly, unlike treated fenceposts or doormats, neonic-treated seeds may constitute one of the largest insecticide uses in the state of California—with substantial and far reaching impacts for the state's soil, water, and wildlife. *See supra* Section II, C. As a wealth of scientific research now demonstrates, neonic-treated seeds create pesticide residues that persist for years in the environment, travel well beyond farm field boundaries, and devastate bird, pollinator, and aquatic animal populations. *Id.* While the amount of neonic-treated seeds used in California is likely massive, the exact number is unknown because seeds remain wholly untracked and unregulated by DPR. *See supra* Section III, B. For DPR to continue to maintain this policy—that a pesticidal product, advertised for its pesticidal effect, and frequently used in California with widespread pesticidal impacts, is yet somehow beyond its regulatory authority over "pesticides"—is untenable. DPR must acknowledge that neonic-treated seeds are pesticides under California law.

C. *California Law Requires that DPR Regulate Neonic-Treated Seeds*

Because neonic-treated seeds constitute pesticides under California law, DPR must register and regulate them as it does other pesticides. The FAC provides that DPR may only exempt pesticides from state regulation in California by agency rule after careful, individualized consideration. However, DPR has never promulgated such a rule or engaged in any such consideration of whether to exempt neonic-treated seeds. Neonic-treated seeds are therefore not exempt and must be regulated as pesticides. In addition, the FAC requires DPR to regulate neonic-treated seeds to protect Californians and the state's environment, including bees and other pollinators, from their known harms and hazards.

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[71] *See supra*, n. 70,

[72] *See generally* DPR Impregnated Materials Guidance.

[73] *See, e.g.,* Syngenta Cruiser Brochure 2012 at 7; Gaucho 600 Seed Treatment Website (advertising imidacloprid seed treatment is "[c]onvenient; applied to the seed by your seed supplier"); Bayer, *Seminis: Neonics Vegetable Seed Treatment Information* (visited Sep. 16, 2020), https://bit.ly/3hIwaw0 (stating under header "Can I Purchase Neonic-Treated Vegetable Seed?" that "[o]ur neonics are sold as part of our FarMore® FI400 and FarMore® FI500 offerings and include Cruiser® 5FS and Cruiser®70WS."). Ads are similar for non-neonic systemic insecticide products. For example, Corteva Agriscience's advertisement for the chlorantraniliprole-based insecticide Lumivia® states that the product provides "effective protection against damage from insects that feed on corn seedlings during vulnerable early season development," and that farmers should "[a]sk your corn seed provider for added protection from Lumivia® insecticide seed treatment." Corteva Agriscience, *Lumivia® Insecticide Seed Treatment*, https://bit.ly/33wAkly.

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i. Neonic-Treated Seeds Are Pesticides that DPR Has Not and Cannot Exempt from Regulation

The FAC allows DPR to exempt pesticides from state regulation only under certain specified circumstances. *See* FAC § 12803. Prior to 1998, the FAC provided DPR with no authority to exempt pesticides from state regulatory requirements, including pesticides exempted from FIFRA regulation by U.S. EPA. 1999 ISOR at 2. That year, the Legislature amended the FAC to allow DPR to exempt FIFRA-exempt pesticides, but only by regulation after careful review and consideration. *See id.*; FAC § 12803. Specifically, to do so, DPR must first: (1) individually evaluate the pesticide and concur with the decision of U.S. EPA; and (2) exclude from the exempting regulation any requirements necessary to protect the public health or the environment. *Id.*

Neonic-treated seeds are FIFRA-exempt pesticides, *see supra* Section III, A, but DPR has not exempted them from state regulation in accordance with the FAC. Pesticides that DPR has formally exempted from regulation are listed in 3 C.C.R. § 6147. The list includes several classes of pesticide products and individual pesticide chemicals, but none of these classes encompasses pesticide-coated seeds or neonics. *See generally* 3 C.C.R. § 6147. As DPR has confirmed, the 1999 ISOR is the agency's only written opinion relevant to the legal status of pesticide-treated seeds.[74] However, the document was never promulgated as a regulation and contains no mention or other evidence of individualized consideration of pesticide-treated seeds. *See generally* 1999 ISOR.

Accordingly, at the most basic level, because FAC § 12803 provides the only circumstances under which pesticides may be exempted from FAC regulation, and neonic-treated seeds have not been so exempted, they must be subject to DPR registration and regulation. Further, the environmentally harmful nature of neonic-treated seeds, and the letter and spirit of the FAC, prevent DPR from adopting a broad regulatory exemption for neonic-treated seeds in the future.

The FAC demands that DPR perform its own analysis of any FIFRA exemption—requiring independent evaluation of U.S. EPA's factual findings, as well as whether those facts support similar exemption under the FAC's more stringent environmentally protective standards. *See* FAC § 12803(b) (mandating that DPR maintain any "specific requirements . . . necessary to protect the public health or the environment" for FAC-exempt pesticides, even where it concurs with a U.S. EPA exemption decision); *see id.* §§ 14001, 14004.5 (governing designation of restricted materials), 14102 (governing regulation of environmentally harmful materials). DPR's current policy, which has the effect of passively endorsing U.S. EPA's treated article exemption for neonic-treated seeds, constitutes an unlawful and uncritical adoption of U.S. EPA's questionable factual record and an abdication of DPR's duty to ensure pesticide use in California does not cause substantial environmental harm. Because neonic-treated seeds do cause that harm, *see supra* Section II, C, they do not qualify for exemption under California law, and DPR must regulate their use.

[74] DPR/NRDC 2020 Email Correspondence.

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ii. DPR Has Additional Duties to Control Neonic-Treated Seeds Due to Their Environmentally Harmful Effects

The FAC seeks to "protect the environment from environmentally harmful pesticides." FAC § 11501(b). To that end, it obligates DPR to act to prohibit or control the use of pesticides that pose substantial hazards to the natural world, particularly where those pesticides are of little or no utility to users. Because neonic-treated seeds pose these hazards in California, DPR must regulate their use.

In addition to the other regulatory requirements, DPR must control environmentally injurious pesticides as "restricted materials." *See* FAC §§ 14001-14015. These pesticides may only be applied pursuant to a time-limited, DPR-issued permit governing the time, place, and manner of application in order to avoid environmental harm. *See* FAC §§ 14006.5, 14007; 3 C.C.R. § 6432. DPR must designate as a restricted material any pesticide that poses a hazard: (1) "to domestic animals, including honeybees;" (2) "to the environment from drift onto streams, lakes, and wildlife sanctuaries;" or (3) "related to persistent residues in the soil resulting ultimately in contamination of . . . waterways, estuaries or lakes, with consequent damage to fish, wild birds, and other wildlife." FAC §§ 14001, 14004.5 (c)-(e), 14005.

The use of neonic-treated seeds produces these hazards—including harms to honey bees from abraded seed dust drift and otherwise, persistent residues in soil which run off to contaminate California water, and the decimation of invertebrate populations, whose losses ripple through ecosystems. *See supra* Section II, C; FAC § 14004.5 (c)-(e). While DPR has found that neonic-treated seeds pose "low risk to honey bee colonies,"[75] the conclusion relies on U.S. EPA assessments that systematically underestimate and ignore the substantial risks that neonic-treated seeds pose to bees, including direct harms from dust drift.[76]

Neonic-treated seeds also pose other environmental dangers that meet the criteria for restricted material listing—particularly those related to water contamination and wildlife impacts. *See* 14004.5 (d), (e). Due to their exceptional potential to contaminate water, all neonic active ingredients commonly used as seed treatments appear on the state's Groundwater Protection List, as well as in an overwhelming proportion of state surface water sampling. *See* 3 C.C.R. § 6800; *supra* Section II, C. Further, DPR is aware that much of this contamination may be linked with neonic-treated seed use. In 2017 comments on U.S. EPA's aquatic risk assessment of the neonic imidacloprid, DPR highlighted research "linking seed treatments and [neonic] pesticide detections in surface water."[77] Subsequent research has confirmed this link—resulting both from drift of neonic seed dust and neonics' persistence and mobility in soils—as well as the considerable damage to fish, wild birds, and other wildlife caused by the resulting neonic water

[75] Risk Determination at 8, 21.

[76] Mineau 2020 at 1-2, 26-38.

[77] DPR, Comments Regarding U.S. Environmental Protection Agency Preliminary Aquatic Ecological Risk Assessment to Support the Registration Review of Imidacloprid (Jul. 5, 2017), https://bit.ly/3042tzT (citing Michelle Hladik et al, *Widespread Occurrence of Neonicotinoid Insecticides in Streams in a High Corn and Soybean Producing Region, USA*, Environmental Pollution (Jun. 27, 2014), https://bit.ly/2CIND98).

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pollution. *See supra* Section II, C. In California, neonics appear in water at levels expected to cause ecosystem-wide damage.[78]

As DPR must control the use of pesticides that meet any one criterion qualifying them as restricted materials, *see* FAC §§ (requiring to DPR "control and otherwise regulate the use of restricted materials" meeting criteria identified in Section 14004.5); 14004.5 (requiring creation of "a list of restricted materials based upon . . . *any* of the following criteria" (emphasis added)), and neonic-treated seeds meet several of these criteria, DPR must control the use of neonic-treated seeds.

The FAC further provides that DPR "shall prohibit or regulate the use of environmentally harmful materials," and, in doing so, "take whatever steps [it] deems necessary to protect the environment." FAC § 14102. As discussed, impacts from the use of neonic-treated seeds run the gamut of environmental injury—from extensive soil and water contamination to wildlife population losses to potential human health harm—and therefore easily meet this standard. *See supra* Section II, C. At minimum, DPR must regulate and track their use through registration in a manner that protects the environment. It must also identify and prohibit uses of neonic-treated seeds where environmental harm cannot be controlled through registration.

Relatedly, under the FAC, DPR "shall endeavor to eliminate from use in the state any pesticide that endangers the agricultural or nonagricultural environment, is not beneficial for the purposes for which it is sold, or is misrepresented." FAC § 12824. Neonic-treated seeds meet these criteria. The unregulated use of neonic-treated seeds threatens California's natural and agricultural environment, including through their adverse impacts the managed and wild bees crucial to the production of numerous state crops. *See supra* Section II, C. A wealth of recent scientific evidence also shows that—at least with respect to field crops like corn—neonic-treated seeds provide little to no benefit for farmers. *See supra* Section II, D. Lastly, to the extent that manufacturers of neonic-treated seeds advertise and sell those seeds in California for pesticidal purposes, but fail to register them as pesticides, those products are misrepresented because the advertising implies they are approved for pesticidal use in California. Accordingly, DPR must endeavor to eliminate environmentally threatening uses of neonic-treated seeds, particularly those whose harms clearly outweigh any purported benefits.

iii. The FAC Requires that DPR Regulate Neonic-Treated Seeds to Protect Pollinator Health

Finally, DPR must rescind its policy and regulate neonic-treated seeds in order to meet the FAC's requirement that it "adopt any control measures necessary to protect pollinator health." FAC § 12838. Independent scientific literature links neonic use with pollinator population losses and other harms to pollinator health and shows that neonic-treated field crop seeds pose substantial risks to bees, both in magnitude and frequency. *See supra* Section II, C. DPR's recent neonic reevalution, however, wholly excludes any formal determination of risk from neonic-treated seeds,[79] and DPR's recent draft regulatory proposal to mitigate neonic risks to pollinators

[78] Mineau 2020 at 1, 16-26.

[79] Risk Determination at 21 ("Risk determinations were only conducted for foliar and soil applications.").

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contains no mitigation for or mention of neonic-treated seeds.[80] As any successful effort to adopt control measures needed to protect pollinator health will necessarily include those addressing the use of neonic-treated seeds, DPR must regulate the use of neonic-treated seeds to satisfy its statutory obligations to safeguard pollinators.

D. *DPR's Nonregulation of Neonic-Treated Seeds Is Unlawful*

DPR's policy that neonic-treated seeds fall outside the FAC's definition of "pesticide" and its decision to effectively and categorically exempt those seeds from regulation violate the California Administrative Procedure Act (APA) and the FAC. DPR has enacted a regulation exempting neonic-treated seeds from regulation under the FAC without going through the public notice-and-comment procedure that the APA requires. *See* Cal. Gov. Code §§ 11340.5(a), 11343(a), 11346-48. Moreover, DPR's policy is unlawful because it conflicts with the plain text of the FAC. Contrary to DPR's position, the definition of "pesticide" unambiguously covers neonic-treated seeds. *See supra* Section IV, B; FAC § 12753(b). Even if the statute were ambiguous, DPR's policy would still be unreasonable and unlawful, particularly given DPR's longstanding legal interpretation that any article advertised for its pesticidal effect "is considered to be a 'pesticide' and must be registered." 1999 ISOR at 3. Because DPR's current policy regarding neonic-treated seeds was enacted in violation of the APA and FAC, DPR lacks authority to maintain the policy and must rescind it.

V. Proposed Regulation

While the use of neonic-treated seeds poses clear and potentially broad-ranging hazards to California's environment, little is known about their actual use patterns in the state. Because both caution and better information must inform DPR's regulatory approach to neonic-treated seeds, we petition DPR to take the following regulatory actions:

- **Registration of All Systemic-Insecticide-Treated Seeds** – DPR must register and track all seeds treated with neonics or other systemic insecticides, denying registration for particular treated seed products or treated seed uses where warranted under the FAC. Because U.S. EPA does not regulate pesticide-treated seeds, DPR should determine the appropriate unit of sale requiring registration (e.g., the seed bag) and should—pursuant to its policy on pesticide impregnated materials—require separate registrations for any materials "containing different pesticide active ingredients [or] different percentages of active ingredients."[81] Further, as with all pesticide registrations, DPR must impose any restrictions necessary to protect public health and California's environment, including prohibitions on particular treated seed products or uses for which environmental contamination cannot be controlled or for which benefits are marginal or outweighed by their harmful effects. Importantly, DPR must ensure tracking of the time, place, and amount of systemic-insecticide-treated seed use through the PUR system.

  Because DPR's current policy is unlawful under the California APA, DPR must

[80] *See generally* Draft Neonic Regulations.

[81] DPR Impregnated Materials Guidance at 2.

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discontinue the policy and begin regulating treated seeds as pesticides immediately. It does not need to engage in a formal rulemaking prior to doing so.

- **Listing of Neonic-Treated Seeds as Restricted Materials** – DPR must add all neonic-treated seed products to the state "restricted materials" list, making them subject to all the relevant permitting requirements. As discussed, neonic-treated seeds meet the standard for restricted material listing under California law, obligating DPR to control their use. Restricted materials permitting requirements will provide DPR with needed flexibility over the time, place, and manner of the use of neonic-treated seeds, allowing the agency to maintain adequate control as it receives information as to the actual scale and magnitude of their impacts. DPR should also list seeds treated with other systemic insecticides as restricted materials where they meet the standard for listing under the FAC.

- **Promotion of Non-Chemical Pest Control Alternatives** – DPR should support research into regenerative agricultural practices that eliminate or reduce chemical inputs—such as cultivation practices, beneficial insects, rotation, and cover crops. DPR should also provide outreach and assistance to farmers and agricultural producers to implement these practices and alternatives where possible. We believe this work can complement existing work and programs—such as that of DPR and the Alternatives to Chlorpyrifos Work Group to identify alternatives to the organophosphate pesticide chlorpyrifos as well as DPR's alliance grant program.

As noted, this regulatory proposal applies not only to the regulation of neonic-treated seeds, but to all seeds treated with systemic insecticides, whose fundamental nature raises the same legal and environmental concerns.

VI. Conclusion

For the foregoing reasons, DPR must end its unlawful policy regarding seeds treated with neonics and other systemic insecticides. We petition the agency to rescind this policy and adopt the regulatory proposal in Section V. In accordance with Cal. Gov. Code § 11340.7(a), we look forward to the agency's response within 30 days.

Thank you for your time and attention to this Petition. If you have any questions, please do not hesitate to contact us.

Respectfully,

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