EARTHJUSTICE

October 12, 2022

Via Electronic & FedEx Standard Overnight Mail

Henry S. Gonzales
Monterey County Agricultural Commissioner
1428 Abbott Street
Salinas, CA 93901
AgComm@co.monterey.ca.us

Re: Request to Review Restricted Materials Permits within One Mile of Ohlone Elementary, Pajaro Middle, and Hall District Elementary, and for Stay Pending Review

Dear Commissioner Gonzales:

Pursuant to California Food and Agriculture Code section 14009, subdivision (a), we are writing on behalf of Californians for Pesticide Reform, Center for Farmworker Families, Monterey Bay Central Labor Council, Pajaro Valley Federation of Teachers, and Safe Ag Safe Schools (collectively, Community Groups) to request that you review your office's decision to issue restricted materials permits authorizing the application of numerous pesticides within a one-mile radius of three schools in the Pajaro Valley without proper environmental review, to the detriment of the children, teachers, farmworkers, and communities of Monterey County. In particular, we request review of all restricted materials permits issued by the Monterey County Agricultural Commissioner (Commissioner) that allow pesticide application within one mile of (1) Ohlone Elementary School, (2) Pajaro Middle School, and (3) Hall District Elementary School.

Records provided to us by your office as of October 4, 2022 indicate at least the following 2022-2023 restricted materials permits that fall within the scope of this request and are included in Attachment 1:

Permits within a One-Mile Radius of Ohlone Elementary 21 Bay Farms Rd, Royal Oaks, CA 95076			
Permit No.	**Operator**[1]	**Ranch(es)**	**Issued / Supplemented**
2700010	Akiyama Nursery	▪ 471 Elkhorn Rd (site 1)	▪ issued 1/7/2022
2701314	Coastal Vista Farms LLC	▪ Skillicorn (site 4)	▪ issued 1/11/2022 ▪ fumigant supp. 8/25/2022
2700482	Royal Oaks Farms, LLC	▪ Royal Oaks East (site 10) ▪ Royal Oaks West	▪ issued 1/14/2022 ▪ fumigant supp. 6/16/2022

[1] Consistent with Food & Agric. Code, § 14009(c)(3), a list of the "name[s] and address[es] of the person[s] in charge of the property to be treated" is included in Appendix A to this request.

		(site 11)	
2700493	Satsuma Farms, LLC	▪ San Cayetano (site 1) ▪ Peterson (site 3)	▪ issued 1/7/2022 ▪ fumigant supp. 9/2/2022
2700614	Willoughby Farms, Inc	▪ Cox (site 3)	▪ issued 1/25/2022
2700617	Yamaoka Brothers	▪ McGowan (site 3)	▪ issued 1/18/2022

Permits within a One-Mile Radius of Pajaro Middle School 250 Salinas Rd, Pajaro, CA 95076			
Permit No.	**Operator**	**Ranch(es)**	**Issued/Supplemented**
2701314	Coastal Vista Farms LLC	▪ Kennedy (site 8)	▪ issued 1/11/2022 ▪ fumigant supp. 8/17/2022
2700147	Driscoll's Research	▪ 404 San Juan Rd (site 1)	▪ issued 12/22/2021
2700216	Growers Transplanting, Inc.	▪ Pajaro Valley (site 4)	▪ issued 12/13/2021
2700253	Jal Berry Farms	▪ McGowan (site 4)	▪ issued 1/25/2022[2] ▪ fumigant supp. 8/18/2022
2700482	Royal Oaks Farms, LLC	▪ Maladin/Pajaro (site 14) ▪ Allison (site 15)	▪ issued 1/14/2022
2700614	Willoughby Farms, Inc	▪ Crosseti (site 26)	▪ issued 1/25/2022
2700617	Yamaoka Brothers	▪ Kennedy (site 2) ▪ McGowan (site 3) ▪ Porter/Kelly (site 5)	▪ issued 1/18/2022

Permits within a One-Mile Radius of Hall District Elementary School 300 Sill Rd, Watsonville, CA 95076			
Permit No.	**Operator**	**Ranch(es)**	**Issued**
2700199	Glez Farms	▪ Ranch 15 (site 15) ▪ Ranch 10 (site 1) ▪ Ranch 20 (site 2)	▪ issued 2/8/2022 ▪ fumigant supps. 6/27, 8/3, 8/5, 8/8, 9/2/2022
2701052	Jacco Farms	▪ Las Lomas (site 1)	▪ issued 7/13/2022 ▪ fumigant supp. 7/13/2022
2700310	Lopez Flowers	▪ 500 Hall Rd (site 1)	▪ issued 6/8/2022 ▪ fumigant supp. 6/8/2022
2700544	R. Montañez Farms LLC	▪ Pini (site 8)	▪ issued 8/5/2022 ▪ fumigant supp. 8/15/2022

To the extent 2022-2023 restricted materials permits also exist for any other sites not listed in the above tables but located within a one-mile radius of Ohlone Elementary, Pajaro Middle, and Hall District Elementary schools, we also hereby request review of those permits as well, because adverse impacts on school children, teachers, farmworkers, and community members "occur generally throughout" the one-mile area surrounding each school, supporting cancellation of *all* permits in the area.[3]

[2] While Jal Berry Farms has a restricted materials permit covering certain ranches, McGowan Ranch (site 4) was not included in the initial permit application materials or any environmental review connected with that permit.
[3] Department of Pesticide Regulation, *Pesticide Use Enforcement Program Standards Compendium, Volume 3: Restricted Materials and Permitting,* at 3-10 (43d rev. Nov. 2018) (hereafter *Compendium*).

Moreover, it is likely that one or more farms located within one mile of Ohlone Elementary School, Hall District Elementary School, and Pajaro Middle School intend to fumigate their crops later in 2022 with restricted materials such as 1,3-dichloropropene (1,3-D) and chloropicrin, but have either not yet applied for fumigant supplements or have received fumigant supplements so recently that we have not yet been able to obtain copies of those records. It is the Commissioner's pattern and practice to issue permits authorizing use of such restricted fumigants without conducting additional environmental review. Accordingly, we hereby challenge any and all fumigant supplements issued within a one-mile radius of the listed schools for the 2022-2023 application season, even if not reflected in the tables above.

Collectively, the permits described above are emblematic of the Commissioner's failure to properly consider and address the health and environmental impacts of restricted materials on surrounding areas, and an abuse of discretion, in violation of the California Environmental Quality Act (CEQA) and the restricted materials laws contained in the Food and Agricultural Code and California Code of Regulations. First, the Commissioner issued permits that fail to disclose the direct and indirect effects of pesticide exposure—including cumulative impacts associated with the many other restricted materials permits granted routinely in the same vicinity—and fail to consider local conditions and effects on sensitive receptors in the vicinity, such as the three schools listed above. Second, by failing to identify environmental impacts, the Commissioner necessarily failed in its subsidiary obligations to mitigate the permits' controllable impacts or deny any permit that would result in serious uncontrollable adverse effects. Third, the Commissioner likewise failed to determine whether the potential environmental costs of each of the permits outweighed their public value. Fourth, the Commissioner's failure to identify environmental impacts precluded a meaningful alternatives analysis, which was also deficient due to the Commissioner's improper reliance on cursory and unsupported attestations in the permit applications.

For the above reasons and as discussed further herein, we respectfully request that you review and rescind all 2022-2023 restricted materials permits issued to farms with application sites within one mile of Ohlone Elementary School, Pajaro Middle School, and Hall District Elementary School, and deny the operators' applications. Additionally, we oppose the issuance or approval of further 2022-2023 restricted materials permits, permit supplements, Notices of Intent, and applications for permit renewals for the 2023-2024 application year associated with the listed permits and one-mile geographic areas surrounding the three listed schools, pending the resolution of the issues presented herein, and we ask that you stay the operation of the challenged permits pending your review.

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https://www.cdpr.ca.gov/docs/enforce/compend/vol_3/rstrct_mat.htm. The *Compendium* is a series of eight manuals that contain pesticide use enforcement directives, interpretations, recommendations, and expectations. The *Compendium* represents the Pesticide Use Enforcement Program's "standard operating procedures."

I. Factual Background

A. Pesticide Use in Monterey County Is Adversely Affecting Children, Teachers, Farmworkers, and Communities.

Parents, teachers, farmworkers, and other community members have long expressed concerns about the use of toxic pesticides near schools in Monterey County. Their concerns are well-founded. Ten years of air quality monitoring data from Ohlone Elementary School confirm that pesticide drift at unhealthful levels is rampant. For example, levels of the restricted fumigant 1,3-D measured at Ohlone Elementary School have exceeded the safe harbor level recently set by the Office of Environmental Health Hazard Assessment (OEHHA) in *every year* going back to 2012.[4]

In fact, a 2014 report from the state's Environmental Health Tracking Program confirmed that Monterey County has the highest percentage of students who attend schools in areas with the greatest pesticide use, with as many as 18,525 students affected annually.[5] Of the top ten pesticides applied near public schools in Monterey County, five are toxic air contaminants, four are cholinesterase inhibitors, three are carcinogens, and two are reproductive/developmental toxins. In 2010, 8,203,711 pounds of pesticide active ingredient were applied in Monterey County.[6] This number has largely remained consistent over time, with the most recent available data reflecting 7,967,672 pounds of pesticides applied in Monterey County in 2018, covering 6,387,355 acres.[7]

At the time of the 2014 Health Tracking report, the 73,872 students in Monterey County were 74.1% Hispanic (54,764), 15.7% White (11,574), 5.0% Asian/Pacific Islander (3,680), 2.1% African American (1,533), and 3.1% Other (2,321).[8] Out of Monterey County students attending schools where pesticides were used within one-quarter mile, 64.7% (22,794) were eligible for free or reduced price meals, which is a measure of poverty.[9]

With regard to the three schools involved in the permit challenge, data compiled by the National Center for Education Statistics for the 2020-2021 school year reflects that Ohlone Elementary

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[4] The new OEHHA level is 3.7 micrograms per day, equivalent to an annual average air concentration of 185 nanograms per cubic meter or 0.04 parts per billion, based on a standard breathing rate of 20 cubic meters of air per day. Ohlone Elementary's air quality results are as follows:

Site	Annual air concentration of 1,3-D in parts per billion, reported by the Department										
Ohlone Elementary	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Av.
	0.16	0.13	0.09	0.12	0.07	0.09	0.05	0.06	0.12	0.059	0.096

Department of Pesticide Regulation, *Pesticide Air Monitoring Results Database* (updated Aug. 2022). https://www.cdpr.ca.gov/docs/emon/airinit/pesticide_air_monitoring_database.htm. The Department is currently undergoing a rulemaking for 1,3-D in which it should adopt the OEHHA level, consistent with scientific evidence regarding the toxicity and carcinogenicity of 1,3-D.

[5] California Environmental Health Tracking Program (CEHTP), *Agricultural Pesticide Use Near Public Schools in California* (April 2014) (hereafter *Health Tracking Report*) at 18. http://www.phi.org/wp-content/uploads/migration/uploads/application/files/m0lvrkqvtqh6897fl65fyegso0p8qqqudkrto9v13d6uiocq0r.pdf.

[6] *Id.* at 6.

[7] Department of Pesticide Regulation, *Total Pounds, Applications, and Acres Treated by County: 2018*. https://www.cdpr.ca.gov/docs/pur/pur18rep/totals/county_subtotals.pdf.

[8] *Id.* at 20.

[9] *Id.* at 22.

School is 98.6% Hispanic, Hall District Elementary School is 98.1% Hispanic, and Pajaro Middle School is 98.7% Hispanic.[10]

In 2010, Monterey was the top county by percentage of its schools in the top quartile of use for carcinogens, reproductive and developmental toxicants, cholinesterase inhibitors, fumigants, priority pesticides for monitoring and assessment, and all pesticides (all categories). It was also the top county by percentage of its students attending schools in the top quartile of use for toxic air contaminants and all other categories.[11] The top ten pesticide active ingredients, by pounds applied, included the following pesticides authorized in the permits: chloropicrin, 1,3-D, malathion, methomyl, and oxydemeton-methyl.[12]

More recent data from the Department confirms that Monterey County still applies these restricted materials in large quantities: chloropicrin (1,619,001.22 pounds); 1,3-D (500,173.96 pounds); malathion (39,472.32 pounds); methomyl (71,715.62 pounds); and oxydemeton-methyl (992.31 pounds).[13] Likewise, data from the Department shows that Monterey County applied 799.19 pounds of aluminum phosphide, 11,426.04 pounds of carbaryl, 32,947.54 pounds of paraquat dichloride, and 34.9 pounds of zinc phosphide in 2018, all of which are restricted materials included in the challenged permits.[14]

The 2014 Health Tracking report further found that in Monterey County, Latinx schoolchildren were 3.2 times more likely than white students to attend schools with the highest use of the most hazardous pesticides. These environmental justice statistics are significant, as pesticide exposure leads to a higher incidence of adverse health effects and puts children at a developmental and educational disadvantage.

Scientific evidence links prenatal exposure to pesticides to an elevated risk of fetal death due to congenital anomalies.[15] For parents whose children survive, studies show an increased risk of neuropsychological and motor development disorders,[16] asthma-like respiratory symptoms,[17]

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[10] National Center for Education Statistics. *Common Core of Data: Ohlone Elementary, Enrollment Characteristics* (2020-2021). https://nces.ed.gov/ccd/schoolsearch/school_detail.asp?ID=062949009600. *Common Core of Data: Hall District Elementary, Enrollment Characteristics* (2020-2021). https://nces.ed.gov/ccd/schoolsearch/school_detail.asp?Search=1&InstName=hall+district+elementary&State=06&SchoolType=1&SchoolType=2&SchoolType=3&SchoolType=4&SpecificSchlTypes=all&IncGrade=-1&LoGrade=-1&HiGrade=-1&ID=062949004543. *Common Core of Data: Pajaro Middle, Enrollment Characteristics* (2020-2021). https://nces.ed.gov/ccd/schoolsearch/school_detail.asp?Search=1&InstName=Pajaro+Middle+School&State=06&SchoolType=1&SchoolType=2&SchoolType=3&SchoolType=4&SpecificSchlTypes=all&IncGrade=-1&LoGrade=-1&HiGrade=-1&ID=062949004547.
[11] *Health Tracking Report* at 37.
[12] *Id.* at 69.
[13] Department of Pesticide Regulation, *Total Pounds, Applications, and Acres Treated by County and Chemical* (2018) at 303, 305, 309-10, 312. https://www.cdpr.ca.gov/docs/pur/pur18rep/totals/county_subtotals_chemical.pdf.
[14] *Id.* at 300, 303, 312, 317.
[15] Erin M. Bell et al., *A Case-Control Study of Pesticides and Fetal Death Due to Congenital Anomalies*, 12 Epidemiology 148 (2001).
[16] Inserm, *Effects of pesticides on health: New data* (2022) (hereafter *Inserm*).; Janie Shelton et al., *Neurodevelopmental Disorders and Prenatal Residential Proximity to Agricultural Pesticides*, 122 Env. Health Perspectives 1103 (2014).
[17] Elizabeth Holman, *Summary Reviews for Additional Epidemiological Literature Studies from Prospective Birth Cohort Studies* (2016).

lower intelligence quotient,[18] lower cognitive functioning,[19] childhood central nervous system tumors,[20] and leukemia[21] as a result of proximity to pesticides like organophosphates, carbamates, paraquat, and phosphides in pregnancy and early childhood. Studies also link proximity to application of pesticides to increased risk of Parkinson's disease and breast cancer.[22] Additionally, chronic pesticide exposure fundamentally alters several key biological mechanisms in the human body implicated in cancer, nervous disorders, and cardiovascular diseases (DNA methylation, metabolic pathways, mitochondrial energy metabolism, and neurotransmitter precursors).[23]

Neurological effects of pesticide exposure can significantly inhibit children's ability to learn and succeed in school, and to retain jobs later. From asthma to cancer to autism, the very limited access to treatment and support can devastate family budgets and add significant stress to households. Even the best teachers and most attentive parents can only do so much if (preventable) exposure to pesticides has caused a child to have decreased lung capacity, cancer, autism, or other neurological problems. It is clear than Latinx communities in Monterey County are being disproportionately burdened by health-harming pesticide exposure beyond the fields and into the classroom.

Of course, the adverse effects of pesticide exposure are not limited to children. A 2016 report from the University of California Los Angeles recognized the "widespread" nature of exposure to multiple pesticides, "from the most heavily exposed farm workers, to neighbors adjacent to or downstream from pesticide application sites," and the increasing body of research showing "that cumulative exposures can have larger than anticipated impacts on public health."[24] After analyzing the use of fumigants including 1,3-D and chloropicrin, the UCLA report concluded that "it is clear that these reactive agents are toxic and carcinogenic in multiple organs" and it is reasonable to conclude that "interactive effects" exist beyond what would be detected in a study of one pesticide individually.[25] Without proper assessment of such risks, the Commissioner is failing in his duty to protect the public health of all the people of Monterey County—from children to teachers and farmworkers and members of the broader community.

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[18] Eric Coker, *Association between Pesticide Profiles Used on Agricultural Fields near Maternal Residences during Pregnancy and IQ at Age 7 Years,* International Journal of Environmental Research and Public Health (2017); Robert Gunier et al., *Residential proximity to agricultural fumigant use and IQ, attention and hyperactivity in 7-year old children*, Environmental Research 158, 358–365 (2017).
[19] Christopher Rowe, *Residential proximity to organophosphate and carbamate pesticide use during pregnancy, poverty during childhood, and cognitive functioning in 10-year-old children*, Environmental Research 150, 128-137 (2016).
[20] Christina Lombardi et al., *Residential Proximity to Pesticide Application as a Risk Factor for Childhood Central Nervous System Tumors,* Environmental Research (2021).
[21] Andrew Park et al., *Prenatal pesticide exposure and childhood leukemia*, International Journal of Hygiene and Environmental Health (2020).
[22] *Inserm.*
[23] Qi Yan et al., *High-Resolution Metabolomic Assessment of Pesticide Exposure in Central Valley, California,* Chemical Research in Toxicology (2021); Kimberly Paul, *Organophosphate pesticide exposure and differential genome-wide DNA methylation*, Science of the Total Environment 645, 1135-1143 (2018).
[24] Virginia Zaunbrecher, et al., *Exposure and Interaction: The Potential Health Impacts of Using Multiple Pesticides*, UCLA Sustainable Technology & Policy Program (2016) at 1 (hereafter *Exposure and Interaction*). https://law.ucla.edu/sites/default/files/PDFs/Publications/Emmett%20Institute/_CEN_EMM_PUB_Exposure%20and%20Interaction.pdf.
[25] *Id.* at 24.

B. The Permits Authorize the Application of Restricted Materials with Substantial Adverse Effects in Close Proximity to Schoolchildren.

The permits at issue authorize the application of the following restricted materials:

Operator/Permit Number	Restricted Materials	Pest	Crops
1. Akiyama Nursery (permit no. 2700010)	▪ Aluminum Phosphide ▪ Paraquat Dichloride	▪ Rodents ▪ Weeds	▪ Uncultivated Ag ▪ Uncultivated Ag
2. Coastal Vista Farms LLC (permit no. 2701314)	▪ Carbaryl ▪ Aluminum Phosphide ▪ 1,3-D ▪ Chloropicrin	▪ Insects ▪ Gophers ▪ Soil pests ▪ Soil pests	▪ Strawberry ▪ Uncultivated Ag ▪ Strawberry ▪ Strawberry
3. Driscoll's Research (permit no. 2700147)	▪ Carbaryl ▪ Methomyl	▪ Insects ▪ Insects	▪ Blueberry / Strawberry ▪ Blueberry
4. Glez Farms (permit no. 2700199)	▪ Carbaryl ▪ Malathion ▪ Aluminum Phosphide ▪ Paraquat Dichloride ▪ 1,3-D ▪ Chloropicrin ▪ Potassium N-methyldithiocarbamate	▪ Insects ▪ Insects ▪ Rodents ▪ Weeds ▪ Soil pests ▪ Soil pests ▪ Soil pests	▪ Strawberry ▪ Strawberry ▪ Uncultivated Ag ▪ Uncultivated Ag ▪ Strawberry ▪ Strawberry ▪ Strawberry
5. Growers Transplanting, Inc. (permit no. 2700216)	▪ Aluminum Phosphide ▪ Zinc Phosphide	▪ Rodents ▪ Rodents	▪ Uncultivated Ag ▪ Uncultivated Ag
6. Jacco Farms (permit no. 2701052)	▪ 1,3-D ▪ Chloropicrin	▪ Soil Pests ▪ Soil Pests	▪ Strawberry ▪ Strawberry
7. Jal Berry Farms (permit no. 2700253)	▪ 1,3-D ▪ Chloropicrin	▪ Soil Pests ▪ Soil Pests	▪ Strawberry ▪ Strawberry
10. Lopez Flowers (permit no. 2700310)	▪ 1,3-D ▪ Chloropicrin	▪ Soil Pests ▪ Soil Pests	▪ Flower ▪ Flower
11. R. Montañez Farms LLC (permit no. 2700544)	▪ 1,3-D ▪ Chloropicrin ▪ Potassium N-methyldithiocarbamate	▪ Soil Pests ▪ Soil Pests ▪ Soil Pests	▪ Strawberry ▪ Strawberry ▪ Strawberry
12. Royal Oaks Farms, LLC (permit no. 2700482)	▪ Aluminum Phosphide ▪ 1,3-D ▪ Chloropicrin	▪ Rodents ▪ Soil Pests ▪ Soil Pests	▪ Uncultivated Ag ▪ Strawberry ▪ Strawberry
13. Satsuma Farms, LLC (permit no. 2700493)	▪ Aluminum Phosphide ▪ Potassium N-methyldithiocarbamate	▪ Rodents ▪ Soil Pests	▪ Uncultivated Ag ▪ Strawberry
14. Willoughby Farms, Inc. (permit no. 2700614)	▪ Carbaryl ▪ Oxydemeton-Methyl ▪ Methomyl ▪ Aluminum Phosphide ▪ Paraquat Dichloride	▪ Aphids ▪ Aphids ▪ Lepidoptera ▪ Rodents ▪ Weeds	▪ Brussel Sprout, Lettuce (Leaf, Romaine, Head) ▪ Broccoli, Brussel Sprout, Cabbage, Cauliflower, Lettuce Head ▪ Brussel Sprout, Cabbage, Cauliflower, Spinach, Lettuce (Head, Leaf, Romaine), Celery ▪ Uncultivated Ag ▪ Cabbage, Cauliflower, Lettuce (Head, Leaf, Romaine), Celery, Uncultivated Ag

15. Yamaoka Brothers (permit no. 2700617)	▪ Carbaryl ▪ Oxydemeton-Methyl ▪ Methomyl	▪ Aphids ▪ Aphids ▪ Lepidoptera	▪ Broccoli, Cauliflower, Lettuce (Leaf, Head), Celery ▪ Broccoli, Cauliflower, Lettuce Head ▪ Broccoli, Cauliflower, Lettuce (Leaf, Head, Romaine), Celery

Each of the restricted materials contained within the 2022-2023 permit universe is inherently "injurious," with toxic properties capable of causing substantial harm to human health and the environment, as described in more detail in Appendix B.[26] It is likely that the adverse effects of these restricted materials are exacerbated when they are used in combination, as many cause similar health effects through common modes of action involving the same exposure pathways. For example, carbaryl, malathion, methomyl, oxydemeton-methyl, and paraquat all cause adverse health effects via inhalation and dermal absorption; and aluminum phosphide and zinc phosphide pose a further inhalation risk.

The following graphics, compiled through a combination of data obtained from the Commissioner under the California Public Records Act and the Commissioner's own geographic information system (GIS) data maintained on the Monterey County Ranch Map Atlas, illustrate a one-mile radius around each of the three schools (Ohlone Elementary School, Pajaro Middle School, and Hall District Elementary School), with green pins depicting the approximate location of the 23 ranches located within those circles and identified herein as part of our restricted materials permit challenge.[27]

Additionally, these graphics contain yellow pins showing the approximate location of the overlapping ranches for which the Commissioner issued permits in 2021. The 2021 permits are relevant to the pattern and practice ongoing in 2022 of omitting fumigants from the initial permit applications, environmental review, and restricted materials permits and adding them later via perfunctory supplements lacking in additional environmental analysis. The 2021 restricted materials permits issued within a one-mile radius of the three schools discussed in this submissions are included as Attachment 2.

[26] Cal. Food & Agric. Code § 14005.
[27] Office of the Agricultural Commissioner, *Ranch Maps* (2020). https://agcomm-montereyco.hub.arcgis.com/datasets/ranch-map-atlas-data-2020-open-data/explore?location=36.349658%2C-121.147988%2C10.17.

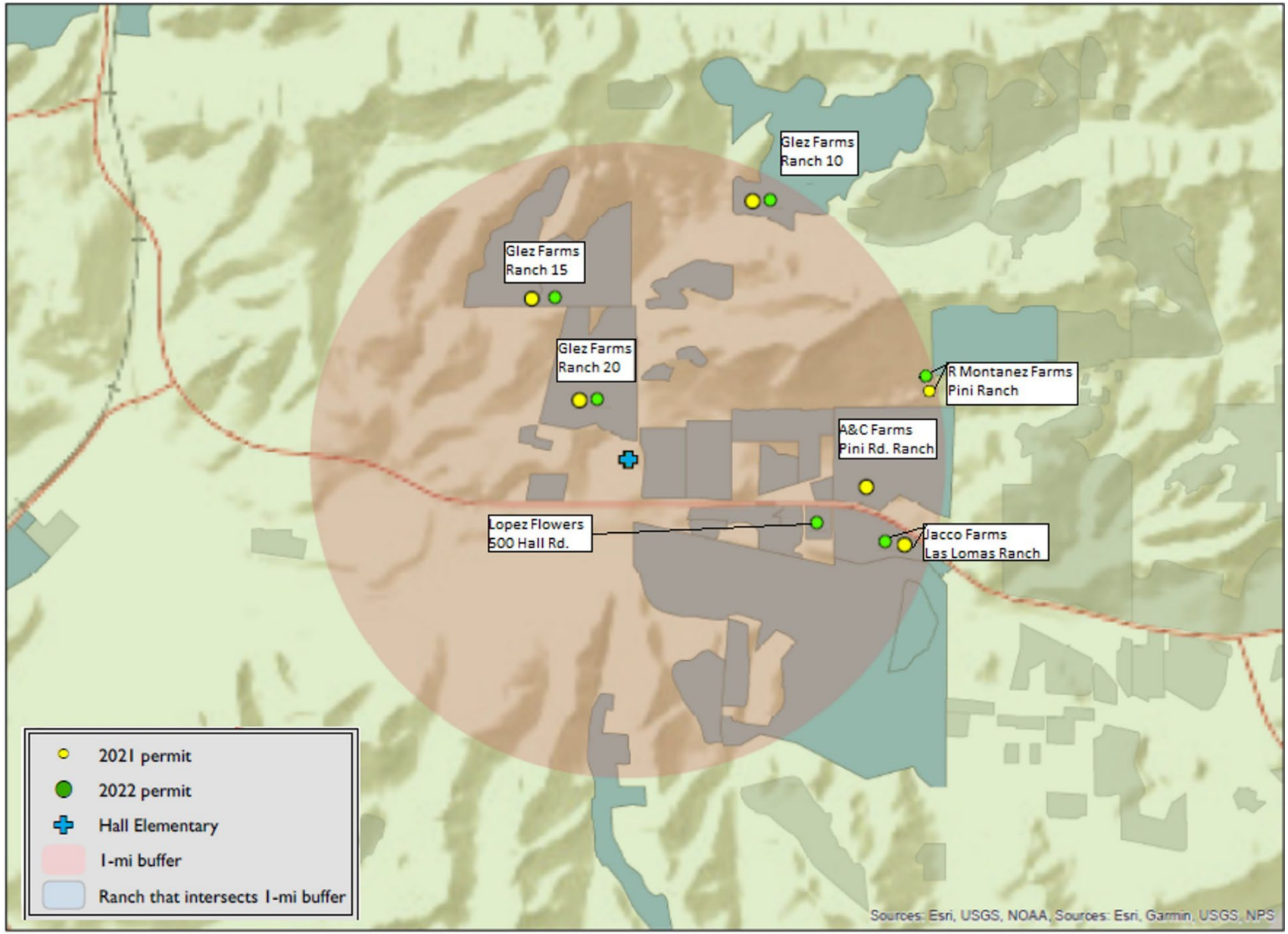

Figure 1. Hall Elementary School Ranches

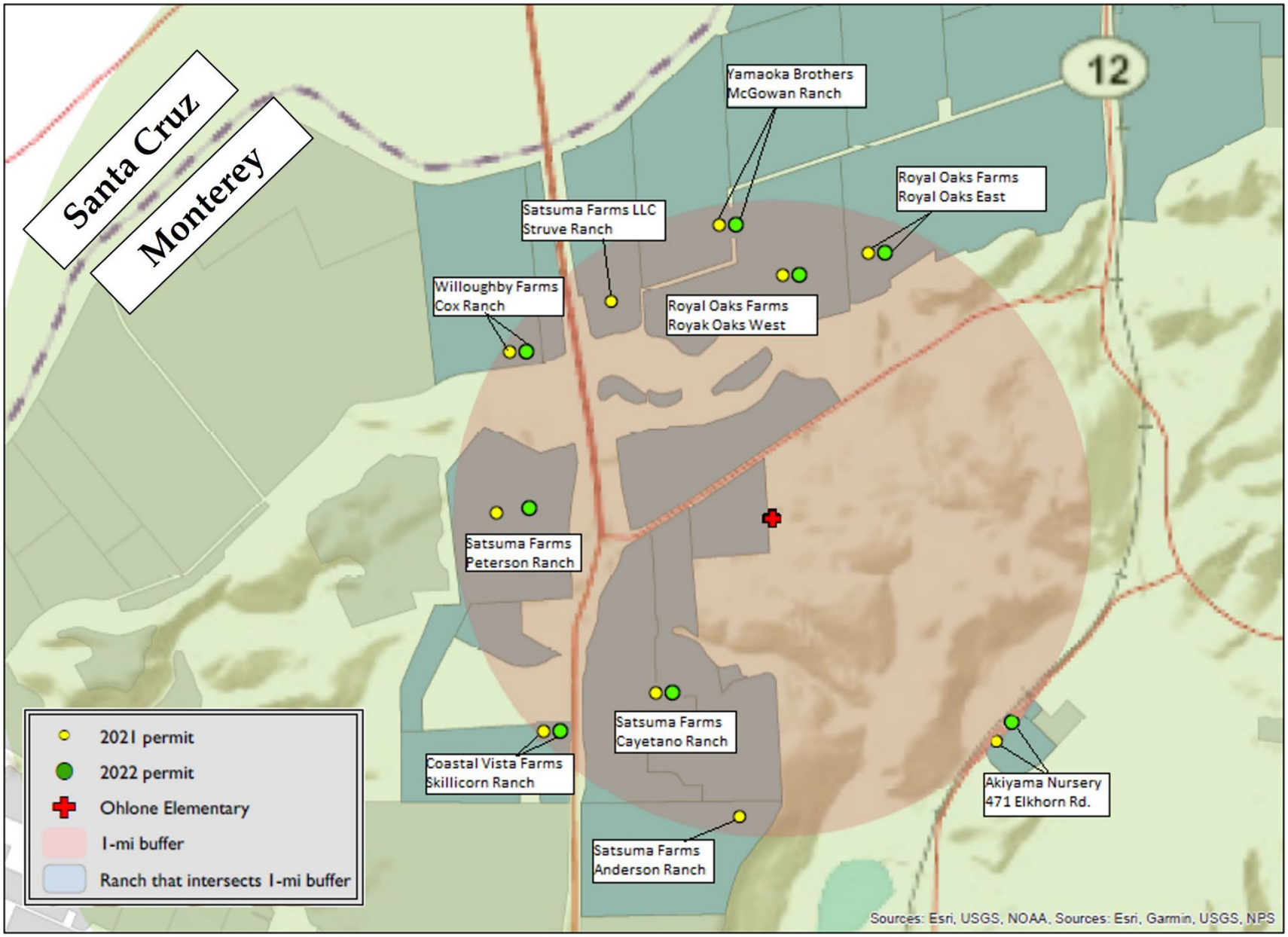

Figure 2. Ohlone Elementary School Ranches

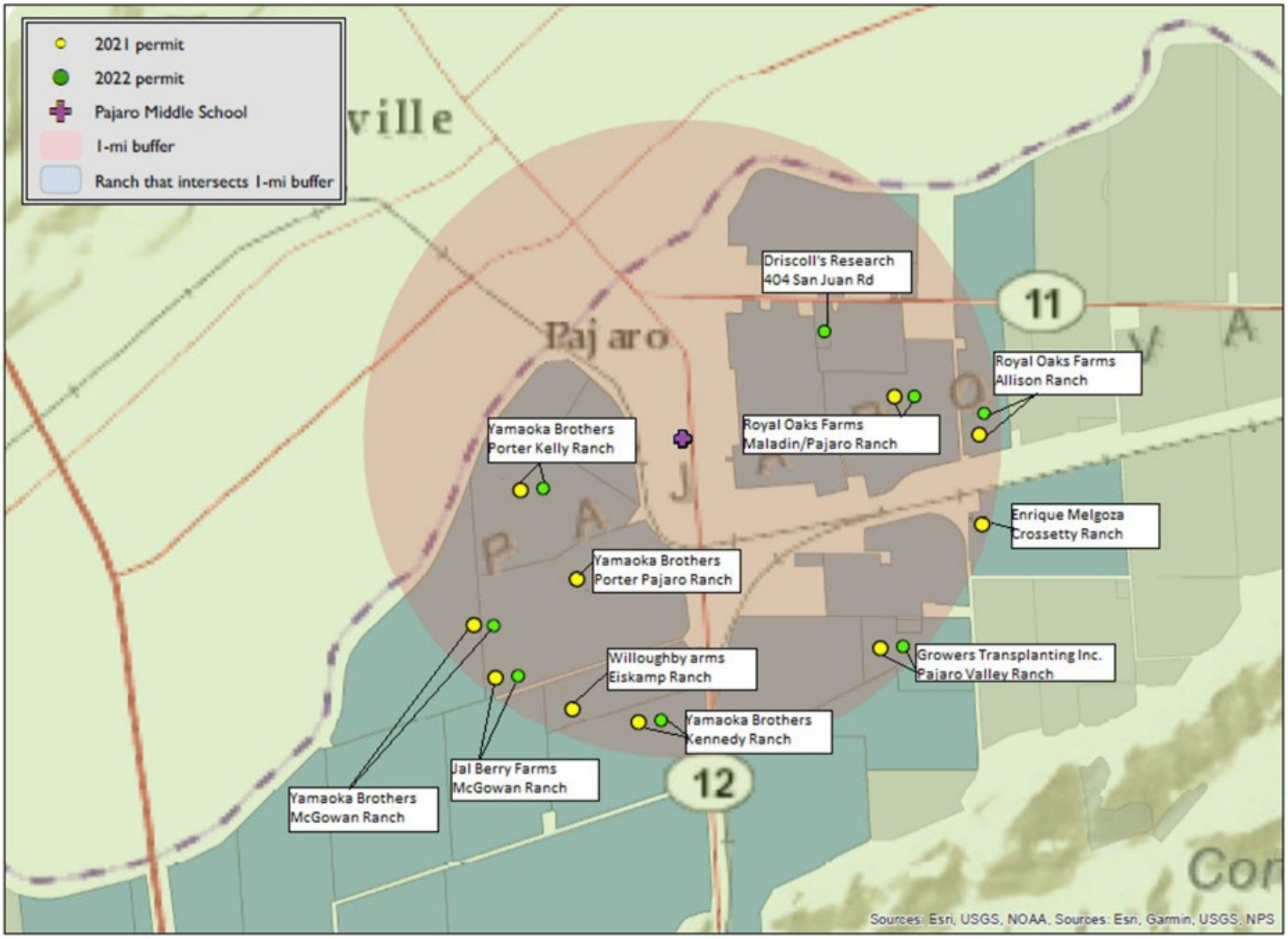

Figure 3. Pajaro Middle School Ranches

C. The Community Groups Are Interested Persons with Standing to Appeal the Permits on Behalf of Their Members.

The Food and Agricultural Code authorizes any "interested person" to request review of a restricted materials permit to the Commissioner, including any "association, corporation, limited liability company, or any organized group of persons whether incorporated or not."[28] The Code mandates liberal construction of its terms in furtherance of protecting "public health, safety, and welfare."[29] This request for review directly relates to the mission of Californians for Pesticide Reform, Center for Farmworker Families, Monterey Bay Central Labor Council, Pajaro Valley Federation of Teachers, and Safe Ag Safe Schools, as discussed further below, and confirms that all of the organizations qualify as "interested persons" entitled to bring this request for review.

1. Californians for Pesticide Reform

Founded in 1996, Californians for Pesticide Reform (CPR) is a statewide coalition of 218 public interest groups dedicated to the shared mission of protecting public health and the environment from the dangers of pesticide use, and committed to the following the policy platform:

- Eliminate use of the worst pesticides—including those that cause cancer, reproductive harm, or acute poisoning.
- Reduce overall use of the remaining pesticides.
- Promote the use of sustainable pest control solutions in our farms, communities, forests, homes, and yards.
- Protect people's right-to-know about pesticide use in our neighborhoods, counties, and state.

Through its Steering Committee, CPR engages in community organizing, litigation, community-based bio-monitoring and air monitoring, legislation, and media and policy work to achieve coalition goals.

CPR member organizations have individual members and supporters who reside and/or work in close proximity to the application sites covered by the permits. CPR member organizations also have individual members and supporters who work at and/or send their children to Ohlone Elementary School, Hall District Elementary School, Pajaro Middle School, and co-located Head Start programs.

2. Safe Ag Safe Schools

Safe Ag Safe Schools (SASS) is a member of CPR and consists of a coalition of over 50 organizations and individuals working together to reduce the threat of pesticide exposure in the Monterey Bay area. SASS is focused on increasing grassroots pressure on policymakers to reduce hazardous pesticide use in and around schools and residential communities based on the

[28] Cal. Food & Agric. Code §§ 38, 14009.
[29] Cal. Food & Agric. Code § 3.

recognition that, to truly improve the lives of our most vulnerable children, we must address critical environmental exposures— some even occurring before birth—that put them at a persistent disadvantage and limit their ability to thrive.

SASS brings local community members to the table in statewide strategic campaigns. SASS's advocacy led to an amendment to the Public Resources Code imposing a quarter-mile "no-spray" buffer zone around public schools and daycares for the most drift-prone pesticides as an important first step toward full protection, and SASS continues to work toward expansion of this buffer zone in light of studies showing impacts from drift at much farther distances. Likewise, SASS's policy priorities include implementing community-wide notification systems to warn residents of pesticide applications before they occur; and phasing out the most health-harming chemicals from use in schools and in surrounding agriculture, including 1,3-D.

SASS provides educational materials about the effects of pesticide exposure as well as the struggle to protect children from toxic agricultural chemicals. SASS has engaged in advocacy work and continues to engage in advocacy work on behalf of students and teachers attending Ohlone Elementary School, Hall District Elementary School, and Pajaro Middle School, among others. Individual members and supporters of SASS reside and/or work in close proximity to the areas covered by the Permits. SASS also has members who work and/or send their children to Ohlone Elementary School, Hall District Elementary School, Pajaro Middle School, and co-located Head Start programs.

3. Center for Farmworker Families

Center for Farmworker Families (CFF) is a 501(c)(3) non-profit organization based in Monterey County's Pajaro Valley, whose mission is to promote awareness about the difficult life circumstances of farmworker families while proactively inspiring improvement in binational family life both in the United States and in Mexico. CFF strives to realize its purpose by engaging in the following activities:

- Promoting the educational advancement of farm workers and their family members working in agriculture, as well as family members who are living on their farms of origin in the west central Mexico countryside
- Supporting projects in both Mexico and California designed to sustainably promote financial and nutritional well-being and independence.
- Examining the federal and state legal structures that govern the lives and well-being of farmworkers and promoting the changes necessary for improved livelihood and well-being, including with regard to pesticide exposure and adverse health effects.
- Research and education.

As part of its outreach, CFF partners with the Campaign for Organic and Regenerative Agriculture (CORA), a grassroots effort involving concerned residents from the Pajaro Valley and the Monterey Bay region seeking to achieve an environmentally and socially just agricultural system, including by educating the public about the use and real impacts of toxic pesticides on

our community, farmworkers, and environment, and exploring ways to phase out pesticides and to convert more Pajaro Valley farmland to organic and regenerative farming.

CFF is a member of CPR and SASS. Supporters of CFF reside and/or work in close proximity to the application sites covered by the challenged permits. Likewise, supporters of CFF work at and/or send their children to Ohlone Elementary School, Hall District Elementary School, Pajaro Middle School, and co-located Head Start programs.

4. Monterey Bay Central Labor Council

Monterey Bay Central Labor Council (MBCLC) serves as a coalition of the Labor Community in Monterey and Santa Cruz Counties. Over 80 unions are affiliated with the MBCLC, representing more than 37,000 union members and their families.

MBCLC is dedicated to representing the interests of working people and mobilizes its members and community partners to advocate for social and economic justice. MBCLC strives daily to vanquish oppression and make our communities better for all people—regardless of race, color, gender, religion, age, sexual orientation, or ethnic or national origin.

The mission of the MBCLC is to improve the lives of workers, their families, and our community—to bring economic justice to the workplace and social justice to the nation. We accomplish this mission by working to build worker power through work on political education and action, economic development in our area, union organizing, a community service and training program, and educational programs for the community.

With regard to pesticide use in Monterey County, MBCLC has actively partnered with CPR and SASS in calling for the Commissioner, Department, and State to restrict the use of 1,3-D and 12 other pesticides linked to childhood cancers; stop pesticide secrecy and immediately post advanced notification of pesticide applications online to enable community members to take safety precautions to avoid harmful pesticide drift; enact larger buffer zones between pesticide applications and residences, schools, hospitals, and other sensitive sites; and overhaul our pesticide and agricultural regulatory systems to put public health first and remedy the gross, race-based inequalities that currently exist in Monterey County, especially with regard to disparate burdens on Latinx residents. MBCLC's Executive Director co-chairs CPR's Steering Committee and also serves on CPR's Executive Committee.

Individual members and supporters of MBCLC reside and/or work in close proximity to the application sites covered by the challenged permits. Likewise, individual members and supporters of MBCLC work at and/or send their children to Ohlone Elementary School, Hall District Elementary School, Pajaro Middle School, and co-located Head Start programs.

5. Pajaro Valley Federation of Teachers

The Pajaro Valley Federation of Teachers, Local 1936 (PVFT) received its charter in 1969, as a Local of the American Federation of Teachers: a union of professionals that champions fairness;

democracy; economic opportunity; and high-quality public education, healthcare, and public services for our students, their families, and our communities. PVFT is committed to advancing these principles through community engagement, organizing, collective bargaining and political activism. PVFT is also part of the California Federation of Teachers and is a member of MBCLC.

PVFT represents teachers and other certificated staff of the Pajaro Valley Unified School District—including Ohlone Elementary School, Hall District Elementary School, and Pajaro Middle School—and has made significant gains for its members in terms of benefits and working conditions. In particular, PVFT represents 1,200 educators who work across 36+ sites in grades TK through 12, child development, adult education, and special education.

With regard to pesticides, PVFT has worked alongside CPR, SASS, and MBCLC for years to protect the health of teachers and students, including through past efforts to ban methyl bromide and methyl iodide, and the ongoing efforts described above to restrict the use of 13 childhood cancer-causing pesticides, obtain better buffers, and receive advanced notice of planned pesticide applications online.

Individual members and supporters of PVFT reside and/or work in close proximity to the application sites covered by the challenged permits. Likewise, individual members and supporters of PVFT work at and/or send their children to Ohlone Elementary School, Hall District Elementary School, Pajaro Middle School, and co-located Head Start programs.

II. Legal Overview

While all pesticide use in California is subject to regulation under the Food and Agricultural Code, the State recognizes a subset of pesticides so inherently "injurious to the environment or to any person, animal, crop, or other property" that their use must be further restricted to protect human health and the environment.[30] Criteria that lead to a "restricted material" designation include, but are not limited to—

- Danger of impairment of public health;
- Hazards to applicators and farmworkers;
- Hazards to domestic animals, including honeybees, or to crops from direct application or drift;
- Hazard to the environment from drift onto streams, lakes, and wildlife sanctuaries;
- Hazards related 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; and
- Hazards to subsequent crops through persistent soil residues.[31]

[30] Cal. Food & Agric. Code § 14005.
[31] Cal. Food & Agric. Code § 14004.5.

The Department of Pesticide Regulation (Department) deems restricted materials as having "a higher potential to cause harm . . . compared to other pesticides."[32]

A. The Commissioner Is Responsible for Monitoring Local Conditions and Using that Knowledge to Protect Public Health and the Environment from Restricted Materials.

With oversight from the Department, the Commissioner is responsible for issuing permits covering the operators' plan for use of restricted materials[33] and reviewing Notices of Intent to apply restricted materials ("NOIs") for *each* specific event involving application of the pesticides, containing supplemental information intended to build on the information required in the initial permit application.[34]

The purpose of the permitting process is "so [the Commissioner] can evaluate the effects an application might have on people and the environment before the pesticide is used."[35] In particular, the delegation to the Commissioner is designed to ensure consideration of local conditions in determining whether usage of the pesticide is appropriate in Monterey County and under what circumstances.[36] "Requiring a permit allows Commissioners to make sure restricted pesticides users prevent harmful effects or use alternatives to the pesticide."[37] The county-level process "allow[s] further restrictions to protect people and the environment in light of local conditions."[38] To facilitate the Commissioner's review, an applicant must include "a map or description of the surrounding area showing any places that could be harmed by pesticides."[39]

Unless an exemption applies,[40] restricted materials are subject to time, place, and manner limitations and, even then, may only be used in "those situations in which it is reasonably certain that no injury will result, or no nonrestricted material or procedure is equally effective and practical."[41] Their usage may be prohibited entirely.[42] Prior to making a decision on an application to use a restricted material, the Commissioner must consider local conditions, including those related to "[u]se in vicinity of schools, dwellings, hospitals, recreational areas,

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[32] Department of Pesticide Regulation, Restricted Material Use Requirements. https://www.cdpr.ca.gov/docs/enforce/permitting.htm#:~:text=Restricted%20materials%20are%20pesticides%20deemed,crops%20compared%20to%20other%20pesticides.
[33] Cal. Food & Agric. Code § 14006.5; Cal. Code Regs., tit. 3, § 6420.
[34] *See* Cal. Code Regs., tit. 3, § 6434(b) (cross referencing section 6428(g)-(i) and explaining that a NOI must include "information concerning the proposed application," including information on changes since the permit's issuance with regard to sensitive receptors that may be adversely affected, and that an operator may use an NOI to list dates of application, method of application (i.e., "dilution, volume per acre…and dosage"), and the identity of the certified applicator).
[35] Department of Pesticide Regulation, *What You Need To Know About: The permit process for restricted pesticides* (hereafter *What You Need To Know*) at p. 1 (2008, rev. 2). https://www.co.monterey.ca.us/home/showpublisheddocument/1137/635695432864800000.
[36] Cal. Code Regs., tit. 3, §§ 6442(a), 6432(a).
[37] *What You Need To Know* at 1.
[38] Department of Pesticide Regulation, *A Guide to Pesticide Regulation in California* at 11 (2017 Update) (hereafter *Guide to Pesticide Regulation*). https://www.cdpr.ca.gov/docs/pressrls/dprguide/dprguide.pdf.
[39] *Compendium*, at 6-6.
[40] Cal. Food & Agric. Code § 14006.7.
[41] Cal. Food & Agric. Code § 14006.
[42] *Id.*

and livestock enclosures," and the Commissioner must include written conditions on use of the restricted pesticide in each permit.[43]

As part of its analysis, the Commissioner—

> must "determine if a substantial adverse environmental impact may result from the use of such pesticide." (Regs., § 6432, subd. (a).) If such a risk exists, but there is a "feasible mitigation measure" that would "substantially reduce the adverse impact," the permit must be "conditioned on the utilization of the mitigation measure." (*Ibid.*) In making these determinations, a commissioner must rely on his or her knowledge of "local conditions." (*Ibid.*)[44]

The Commissioner may *not* issue a restricted material permit if (a) the pesticide "has demonstrated serious uncontrollable adverse effects either within or outside the agricultural environment," (b) the pesticide has costs in terms of environmental detriment that outweigh the public value of its use, or (c) "there is a reasonable, effective, and practicable alternate material or procedure that is demonstrably less destructive to the environment."[45] Likewise, a Commissioner "must deny a permit application if he or she concludes that use of the pesticide may harm people or the environment and no restrictions are available to mitigate that harm."[46] The Commissioner's decision "must be well-substantiated and documented."[47]

In addition to the issuance of a restricted material permit, Monterey County requires a NOI in connection with all restricted material permits 24 to 48 hours prior to pesticide application, "to provide specific and critical information that was not available at the time the preliminary permit was issued," including "to determine whether the information on the NOI is consistent with that on the permit; and whether any environmental conditions have changed since the permit was issued."[48] A NOI "must describe the specific site to be treated and the pesticides to be applied. It must also tell the Commissioner if there are any changes since the original permit was issued," thereby giving the Commissioner "another chance to review the proposed pesticide use and apply more restrictions, if needed."[49] It is the permittee's obligation to ensure the accuracy and timeliness of a NOI.[50]

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[43] Cal. Food & Agric. Code § 14006.5.
[44] *Vasquez v. Dep't of Pesticide Reg.*, 68 Cal. App. 5th 672 (2021).
[45] Cal. Food & Agric. Code §§ 14006.5, 12825(a)-(c).
[46] *What You Need To Know* at 2.
[47] *Id.*
[48] Monterey County, *Monterey County General Permit Conditions*, § A1-NOI (hereafter *Monterey Gen. Permit Conditions*). https://www.co.monterey.ca.us/home/showpublisheddocument/1123/635695432605600000. *See also* Cal. Code Regs., tit. 3, § 6434(b) (stating that a Commissioner may require operators to submit a "notice of intent" providing information about the planned pesticide application at least 24 hours before it occur).
[49] *What You Need To Know* at 2.
[50] *Id.*

B. The Commissioner's Responsibilities under the Food and Agricultural Code Operate in Tandem with CEQA.

The restricted materials permitting process operates as a "certified regulatory program," meaning that the process is exempt from certain portions of CEQA, such as the requirement for formal environmental impact reports, but "remain[s] subject to the broad policy goals and substantive standards of CEQA."[51] Specifically, certified programs remain subject to "the policy of avoiding significant adverse effects on the environment where feasible," and agencies like the Commissioner must submit "a plan or other written documentation containing environmental information."[52]

Compliance with the restricted materials permitting process qualifies as functionally equivalent to preparing an environmental impact report under CEQA, as long as the process includes certain "essential" elements, including "[d]ocumentation of local environmental impact" and "[c]onsultation with other agencies."[53] Such written documentation must include "a description of the proposed activity with alternatives to the activity, and mitigation measures to minimize any significant adverse effect on the environment."[54]

The Department acknowledges that "[i]n virtually all cases" involving restricted materials permits, "there will be one or more identified hazards to some element of the public or environment."[55] Likewise, the Department advises Commissioners to "presume that there is a likelihood, or at least the potential, of substantial adverse environmental impacts" where a sensitive site is located near the treatment area.[56]

Cumulative impacts are "an integral part" of CEQA analysis, including for certified programs.[57] Cumulative impacts include "the incremental effect" of an action such as issuance of a permit, "when viewed in connection with past, current or future approved projects,"[58] such as "exposure to multiple pesticides with common modes of action."[59] Additionally, "'[S]ignificant cumulative impacts must be considered in the course of any environmental inquiry subject to CEQA's broad policy goals, whether or not also subject to CEQA's EIR requirements.'"[60] Agencies must look for and reasonably assess potential cumulative impacts.[61] "A cumulative impact analysis which

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[51] *Pesticide Action Network N. Am. v. Cal. Dep't of Pesticide Reg.* (*PANNA*), 16 Cal. App. 5th 224, 242 (2017). While *PANNA* involved a challenge to the registration of a pesticide rather than a permit, its logic nonetheless applies with equal force here because the Court was interpreting section 21080.5(c) of the Public Resources Code, which governs all certified regulatory programs, including the restricted materials permitting program. Cal. Code Regs., tit. 14, § 15251(i)(4).
[52] Cal. Code Regs., tit. 14, § 15250; Pub. Res. Code, § 21080.5(a). Notably, section 21080.5 also required the administering agency (i.e., the Department) to adopt rules and regulations providing for public notice and comment related to the Commissioner's permitting decisions and the environmental documentation, which the Department has failed to promulgate to date. Pub. Res. Code, § 21080.5(d)(2)(E)-(F), (3).
[53] *Compendium* at 3-5.
[54] Pub. Res. Code § 21080.5(d)(3)(A).
[55] *Compendium* at 7-2.
[56] *Id.* at 7-3.
[57] *PANNA*, 16 Cal. App. 5th at 248.
[58] *Id.*
[59] *Guide* at 85.
[60] *Id.* at 249 (citation omitted).
[61] *Id.*

understates information concerning the severity and significance of cumulative impacts impedes meaningful public discussion and skews the decisionmaker's perspective concerning the environmental consequences of the project, the necessity for mitigation measures, and the appropriateness of project approval."[62]

III. Specific Violations

A. The Commissioner Did Not Properly Consider the Potential Environmental Impacts of the Permits.

1. The Combined Applications and Permits Are Patently Deficient and Devoid of an Impacts Analysis.

None of the 13 specific permits at issue in this request is remotely close to qualifying as "a plan or other written documentation containing environmental information" functionally equivalent to an environmental impact report.[63] Instead, the permits reflect an abdication of the Commissioner's core functions.

Each of the 13 permits contains the same two references to environmental impacts. The permits' front pages and the Operation-Wide Conditions section both contain the *applicants'* boilerplate attestation that they have "[t]ak[en] into account . . . environmental . . . factors" and adopted feasible mitigation measures that "would substantially lessen any significant adverse impact on the environment." At no point does any of the permits identify or elaborate on what those impacts are, and the permits contain no written analysis by the *Commissioner*. The Commissioner cannot rely on the applicants' unsubstantiated assertions regarding environmental impacts because of the Commissioner's non-delegable statutory duty to conduct an independent review.

These deficiencies are especially glaring in light of the presumption applicable to restricted materials permit applications—that "[i]n virtually all cases [involving restricted materials], there will be one or more identified hazards to some element of the public or environment" sufficient to create "a likelihood, or at least the potential, of substantial adverse environmental impacts."[64]

Moreover, the failings identified above are consistent with a systemic, statewide failure identified in a 2019 report from the University of California Los Angeles, which found no evidence that Commissioners consider cumulative exposure during the restricted materials permitting process or impose special mitigation measures when operators apply multiple fumigants to the same or nearby ranches.[65]

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[62] *Id.* at 250 (quotation marks and citation omitted).
[63] Pub. Res. Code, § 21080.5(a).
[64] *Compendium* at 7-2–7-3.
[65] Timothy Malloy, et al. *Governance on the Ground: Evaluating the Role of County Agricultural Commissioners in Reducing Toxic Pesticide Exposures*, UCLA (2019) (hereafter, *Governance on the Ground*) at 3. https://law.ucla.edu/sites/default/files/PDFs/Publications/Emmett%20Institute/_CEN_EMM_PUB_Governance%20on%20the%20Ground.pdf.

In the absence of evidence demonstrating that the applicants actually identified and evaluated environmental impacts, and that the Commissioner independently confirmed such evaluation was proper, denial of the applications was necessary.

2. The Commissioner Has Failed to Evaluate Local Conditions.

While consideration of local conditions is a key function of the Commissioner, the permits contain no references to local conditions other than boilerplate unhelpfully noting, without elaboration, that "schools, parks, dwellings, lakes, waterways, or habitats of rare, endangered or threatened species" are "sensitive area[s]," and that NOIs are required for each planned application of a restricted material adjacent to such sites. Likewise, the maps accompanying the permit applications reflect an improperly narrow geographic focus with inadequate labeling and no explanation as to the significance of the features depicted.

As noted above, the Commissioner had an obligation to consider "[u]se in vicinity of schools, dwellings, hospitals, recreational areas, and livestock enclosures,"[66] but it is difficult to discern from the maps the locations of the nearest sensitive receptors relative to the applicants' ranches. The Department interprets this statute as requiring consideration of "all known areas that could be adversely impacted by the use of the pesticide(s)," including "playgrounds . . . labor camps, parks, lakes, waterways, wildlife management areas . . .[and] crops."[67] This interpretation is consistent with the plain meaning of the word "vicinity."[68]

Rather than the required "map or description of the surrounding area showing any places that could be harmed by pesticide,"[69] all 13 permits zero in on the boundaries of each ranch with a single Google Earth-style image. The maps lack a scale for an accurate understanding of the distances depicted. They contain occasional labels such as "house" or "yard" while completely ignoring other features on the same map.

While the maps associated with each of the challenged permits speak for themselves, with deficiencies visible to lay observation, key problems are as follows:

Farm/Permit	**Ranch Map Description**
1. Akiyama Nursery (permit no. 2700010)	▪ 471 Elkhorn Rd (site 1): only labels 2 "houses" and 1 "well," ignores numerous surrounding structures in all directions that appear to be additional homes or businesses. Map extends only a few hundred feet from the boundaries of the ranch. Ohlone Elementary School not marked on map despite location less than one mile away. Adjacent agricultural properties are also unlabeled. No accompanying analysis of sensitive receptors.
2. Coastal Vista Farms LLC (permit no. 2701314)	▪ Skillicorn (site 4): map in fumigant supplement contains only two labels—"yard" and "AW" with no explanation for the

[66] Food & Agr., § 14006.5.
[67] *Compendium* at 6-6.
[68] *See People v. Ervin*, 53 Cal. App. 4th 1323, 1329 (1997) (explaining the dictionary definitions as "the quality or state of being near, proximity; a surrounding area or district; neighborhood") (citation and quotation omitted).
[69] *Compendium* at 6-6.

	abbreviation. No label on large industrial complex to the north of the ranch or developed sites at the southwest and southeast corners. No label on four water bodies. Adjacent agricultural properties unlabeled. Map extends only a short distance on all sides. No scale provided to identify distances. Ohlone Elementary School not marked on map despite location less than one mile away. No accompanying analysis of sensitive receptors. Only one street labeled without a cross-street to enable identification of geographic location. Map in original permit contains even less detail and is further zoomed-in. ▪ Kennedy (site 8): No map provided with original permit. No map provided with fumigant supplement. To the extent the permit was amended to include a ranch map, that map suffers from the same or similar defects as the maps discussed with particularity in this chart.
3. Driscoll's Research (permit no. 2700147)	▪ 404 San Juan Rd (site 1): Map contains only two labels—"Homes" to the immediate east and west of the ranch—and hardly any details. No labels on developed tracts to the northwest and northeast of the ranch. Map extends only a short distance on all sides. No scale provided to identify distances. Only one street labeled without a cross-street to enable identification of geographic location. Pajaro Middle School not marked on map despite location less than one mile away. Adjacent agricultural properties unlabeled. No accompanying analysis of sensitive receptors.
4. Glez Farms (permit no. 2700199)	▪ Ranch 10 (site 1): Fumigant supplements included 3 similar maps for blocks 10-12 of ranch 10. Maps extend only a short distance on all sides. No scale provided to identify distances. One contains no labels and the others only label an entrance and a yard. Large forested tracts and 3-4 water bodies unlabeled. There appear to be residential homes to the north, northeast, and west and south. No map depicts Hall District Elementary despite location less than one mile away. Block 10 map contains a light-green-colored overlay in the southeast corner of the map that may be a 0.25 mi school buffer zone but there is no accompanying legend that would make this information obvious to the public. 2/3 maps have insufficient cross-streets to identify geographic location. Inputting cross-streets into Google Maps, the most zoomed out map reflects distances around 1,000' to the north/east/west and 2,000' to the south of the ranch. No accompanying analysis of sensitive receptors. ▪ Ranch 20 (site 2): Depicts Hall District Elementary and Head Start Program abutting southern border of ranch with no accompanying analysis of sensitive receptors. Map extends only a short distance on all sides. No labels on other areas such as forested swath to the east, small waterbody to the southeast, what appears to be a residential neighborhood to the southwest, and industrial complexes to the southwest and southeast. Inputting the school into Google Maps for reference, the boundaries only appear to extent 750' west, 1,000' east/south, and a few hundred feet north.

	▪ Ranch 15 (site 15): Only two labels, both wells. Ignores what appears to be densely populated residential areas and large, forested swaths. Unclear whether the swatch of trees includes any recreational areas such as playgrounds and parks, or a wildlife management area. While the map includes a light green-colored overlay that might be part of a 0.25 mi school buffer zone, there is no accompanying legend that would make this information obvious to the public. Hall District Elementary School not marked on map despite location less than 1 mi. away. Adjacent agricultural properties are also unlabeled. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting cross-streets to Google Maps, distances appear to be less than 1,500' to the south, around 1,000' to the east, around 750' to the west, with northern border cut off. No accompanying analysis of sensitive receptors.
5. Growers Transplanting, Inc. (permit no. 2700216)	▪ Pajaro Valley (site 4): Map does not label any features other than the ranch. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting cross-streets to Google Maps, the distances appear to be around 2,000' on all sides. Unlabeled forested tract and small waterbody to the southeast. Small unlabeled residential or industrial complex to the northeast. Unlabeled residential and industrial areas to the northwest. Adjacent agricultural properties are also unlabeled. While the map includes a light-green-colored overlay in the northwest corner, which might be part of a 0.25 mi school buffer zone, there is no accompanying legend that would make this information obvious to the public. Pajaro Middle School not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors.
6. Jacco Farms (permit no. 2701052)	▪ Las Lomas (site 1): Two maps provided with fumigant supplement focused primarily on location and quantity of fumigants to be applied, and distance to various structures. Maps appear to use boxes to denote structures, but nature of such structures is unclear from labeling without a legend (labels include "H," "B," and a third that is difficult to read but might be "GW"). Only other label is for a barn. Scale reflects that map extends, at most, a few hundred feet beyond ranch boundaries in any direction. Unlabeled forested areas appear to the south and northeast of the ranch. Hall District Elementary School not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors.
7. Jal Berry Farms (permit no. 2700253)	▪ McGowan (site 4): No map provided with original permit. No map provided with fumigant supplement. To the extent the permit was amended to include a ranch map, that map suffers from the same or similar defects as the maps discussed with particularity in this chart.
8. Lopez Flowers (permit no. 2700310)	▪ 500 Hall Rd (site 1): Map contains limited labeling (A&C Farms to northwest, Jesus Calvillo to the west, and "houses" and "well" to the south). Other adjacent agricultural properties unlabeled.

	Unlabeled residential neighborhood appears to the north. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting street names into Google Maps, distances appear to be around a few hundred feet to the north, 200' to the east, less than 300' to the west, and 400' to the south. Hall District Elementary School not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors.
9. R. Montañez Farms LLC (permit no. 2700544)	▪ Pini (site 8): Map provided with fumigant supplements labels a few houses and one entrance but ignores what appears to be residential neighborhoods to the southeast and a house to the south. Four unlabeled waterbodies appear on the map along with large unlabeled forested tracts to the north and south. Adjacent agricultural properties unlabeled. Map extends only a short distance on all sides, with almost nothing outside ranch boundaries visible to the west and east. No scale provided to identify distances. Lack of labeled cross-streets prevents identification of geographic location. Hall District Elementary School not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors.
10. Royal Oaks Farms, LLC (permit no. 2700482)	▪ Royal Oaks East (site 10): Map labels only a single well and a single home abutting the ranch. Unlabeled agricultural tracts appear to the north, with unlabeled forested tracts and a substantial number of residences to the south. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting cross-streets into Google Maps, distances appear to be around 1,500' to the north and south but no more than 200' to the east and west. Ohlone Elementary not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors. ▪ Royal Oaks West (site 11): Map labels three wells and three yards. Unlabeled agricultural tracts surround the ranch. Unlabeled forested tract appears to the south, along with two homes to the south and a residential neighborhood to the southeast. Map extends only a short distance on all sides. No scale provided to identify distances. Map extends only a short distance on all sides. Inputting labeled streets into Google Maps, distances appear to be less than 1,000' to the south, 200'-300' to the east and west, and 500' to the north. Ohlone Elementary not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors. ▪ Maladin/Pajaro (site 14): Map contains no labels outside of three adjoining ranches. Unlabeled agricultural tracts surround the ranch. Unlabeled industrial sites appear to the north/south. Unlabeled potential residences appear to the northwest, northeast, southwest, and due south. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting cross-streets into Google Maps, distances appear to be around 1,000' to the south and north, 750' to the west, less than 1,500' to the east. There is a hint of light-green-colored overlay at the west edge of

	the map, might be part of a 0.25 mi school buffer zone, but there is no accompanying legend that would make this information obvious to the public. Pajaro Middle not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors. ▪ Allison (site 15): Map labels three homes, one area of farmworker homes, and an industrial site called "Duran," but map extends only a short distance on all sides. No scale provided to identify distances. Inputting cross-streets into Google Maps, distances appear to be around 500' to the east and west, and a few hundred feet to the south. The northern border of the ranch abuts the edge of map. Unlabeled agricultural tracts appear to the east. Pajaro Middle not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors.
11. Satsuma Farms, LLC (permit no. 2700493)	▪ San Cayetano (site 1): Ohlone Elementary and Head Start Program appear on the map with no accompanying analysis of sensitive receptors. Map labels a yard, office and "AW" with no legend to define acronym. Three unlabeled waterbodies to the west. Unlabeled forested tracts to the east and southeast. Unlabeled residential neighborhood surrounding the schools. Unlabeled industrial site to the west. Unlabeled structures to the south and southwest. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting Ohlone Elementary into Google Maps, distances appear to be around 1,500' to the east, 500' to the north and south, and 750' to the west. ▪ Peterson (site 3): Map contains no labels outside of ranches. Unlabeled features include six waterbodies, a large industrial complex to the south, forested tracts to the north and west, homes to the northeast, and agricultural lands. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting cross-streets into Google Maps, distances appear to be around 1,000' to the east and north, and 2,000' to the west and south. Ohlone Elementary not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors.
12. Willoughby Farms, Inc. (permit no. 2700614)	▪ Cox (site 3): Map does not label any sensitive receptors. Unlabeled features include six waterbodies to the south of the ranch, agricultural lands surrounding the ranch, a large industrial complex to the south, another industrial complex to the northwest, the Pajaro River, potential homes to the southeast and southwest, and forested tracts to the south. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting cross-streets into Google Maps, distances appear to be around 2,000' to the east, 3,000' to the west, 3,500' to the north and south. Ohlone Elementary not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors. ▪ Crosseti (site 26): Map does not label any sensitive receptors. Unlabeled features include surrounding agricultural tracts, an industrial complex to the southwest, potential residences to the northwest, and an industrial complex to the north. Map extends

	only a short distance on all sides. No scale provided to identify distances. Inputting cross-streets into Google Maps, distances appear to be 750' to the north and south, and less than 500' to the west and east. Pajaro Middle not marked on map despite location less than 1 mi. away. No accompanying analysis of sensitive receptors.
13. Yamaoka Brothers (permit no. 2700617)	▪ Kennedy (site 2) / McGowan (site 3): A joint map for both ranches labels two wells and a "shop/yard." Unlabeled features include forested tracts and neighborhoods to the south, surrounding agricultural tracts, the Pajaro River, and a number of structures in the northeast corner of the map. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting cross-streets into Google Maps, distances for Kennedy Ranch appear to be around a couple hundred feet to the east, 2,000' feet to the north, 3,500' to the south, and 4,500' to the west. Distances for McGowan Ranch appear to be around a couple hundred feet to the west, less than 2,000' to the north, 1,000' to the east, and 2,500' to the south. Hint of light-green-colored overlay appears in the northeast corner of the map, which might be part of a 0.25 mi school buffer zone, but there is no accompanying legend that would make this information obvious to the public. Pajaro Middle not marked on map despite location less than 1 mi. away from Kennedy Ranch. Ohlone Elementary not marked on map despite location less than 1 mi. away from McGowan Ranch. No accompanying analysis of sensitive receptors. ▪ Porter/Kelly (site 5): Pajaro Middle appears on the map with no accompanying analysis of sensitive receptors. Labels include Pajaro River, Pajaro Community, "coolers," "enter," a yard, and four wells. Unlabeled features include surrounding agricultural tracts, and an industrial complex to the northwest of the ranch. Map extends only a short distance on all sides. No scale provided to identify distances. Inputting Pajaro Middle into Google Maps, distances appear to be around 500' to the east and west, 1,000' to the south, and a couple hundred feet to the north.

In examining sensitive receptors in the "vicinity" or "surrounding area" of an application site that "could be" adversely affected, the Commissioner should map out sensitive receptors within at least a 7.5-mile radius. The Department recorded concentrations of 1,3-D at 20 ppb (compared to the new OEHHA level of 0.04 ppb) at the Shafter air monitoring site from a pesticide application 7.5 miles away on January 12, 2020 (see air monitoring data provided in Attachment 3), confirming that sensitive receptors within this distance are still located close enough to experience pesticide drift.

While the Commissioner may attempt to downplay the Shafter results as pertaining to Kern County rather than Monterey County, research has long shown the potential for spray drift and volatization drift to travel substantial distances. For example, it is recognized that air movement, particularly from temperature inversions ("when warm air, which is light, rises upward into the atmosphere and cool air, which is heavy, settles near the ground") can lead to "damaging, long-

distance drift."[70] Temperature inversions can occur during low wind conditions, and "can sometimes result in more extensive drift than [pesticide applications] made under high winds."[71]

The precautionary principle also weighs in favor of the Commissioner examining a broad radius at this initial analysis stage, consistent with legislative intent of bringing the Commissioner's local expertise to bear on the advisability of whether a restricted material permit should be issued at all, or whether usage should be prohibited entirely in a particular area. The missing information necessary to paint a true picture of sensitive receptors that could be adversely affected by pesticide applications is essential to the Commissioner's ability to fulfill his statutory mandate to consider local conditions and evaluate whether risks to the local community outweigh potential benefits to the crop.

Importantly, even if the permit applicants had included maps covering a 7.5-mile distance and had properly labeled all sensitive receptors, those maps alone would be insufficient to satisfy the Commissioner's obligation to evaluate the likelihood of adverse impacts in light of local conditions, without any accompanying analysis analyzing the potential effects of applications on such receptors. As discussed above, such adverse impacts are presumptive—and, in fact, likely—due, at a minimum, to the toxicity of each and every pesticide in the permits and the proximity of Ohlone Elementary School, Pajaro Middle School, and Hall District Elementary School within one mile of the application sites. Issuance of the permits must be rescinded.

3. The Permits Will Cause Substantial Direct, Indirect, and Cumulative Adverse Health Impacts.

It is clear that the Commissioner would not have been able to rebut the presumption of adverse impacts even if he had conducted a proper analysis.

First, numerous epidemiological studies (summarized above and included in Attachment 3 along with other sources cited) confirm the link between proximity to pesticide exposure and substantial adverse health effects. The Commissioner has failed consistently to evaluate the direct, indirect, and cumulative effect of exposure to multiple restricted use pesticides from multiple locations throughout the year.

Second, additional documents referenced in Appendix B and attached hereto demonstrate the toxic properties of each of the restricted materials in the challenged permits and their potential for causing substantial adverse effects.

Third, a proper analysis of local conditions would reveal numerous sensitive receptors in the vicinity of the application sites, including homes within a few hundred feet of ranches listed in

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[70] Ryan Miller & David Nicolai, *Temperature inversions: Something to consider before spraying*, University of Minnesota Extension (June 14, 2017). https://blog-crop-news.extension.umn.edu/2017/06/temperature-inversions-something-to.html#:~:text=Applying%20pesticides%20during%20a%20temperature,is%20no%20mixing%20of%20air.

[71] Frederick M. Fishel & J.A. Ferrell, *Managing Pesticide Drift*, University of Florida, IFAS Extension. https://edis.ifas.ufl.edu/pdf/PI/PI23200.pdf.

the permits, and the schools identified above, which are all less than one mile from application sites.

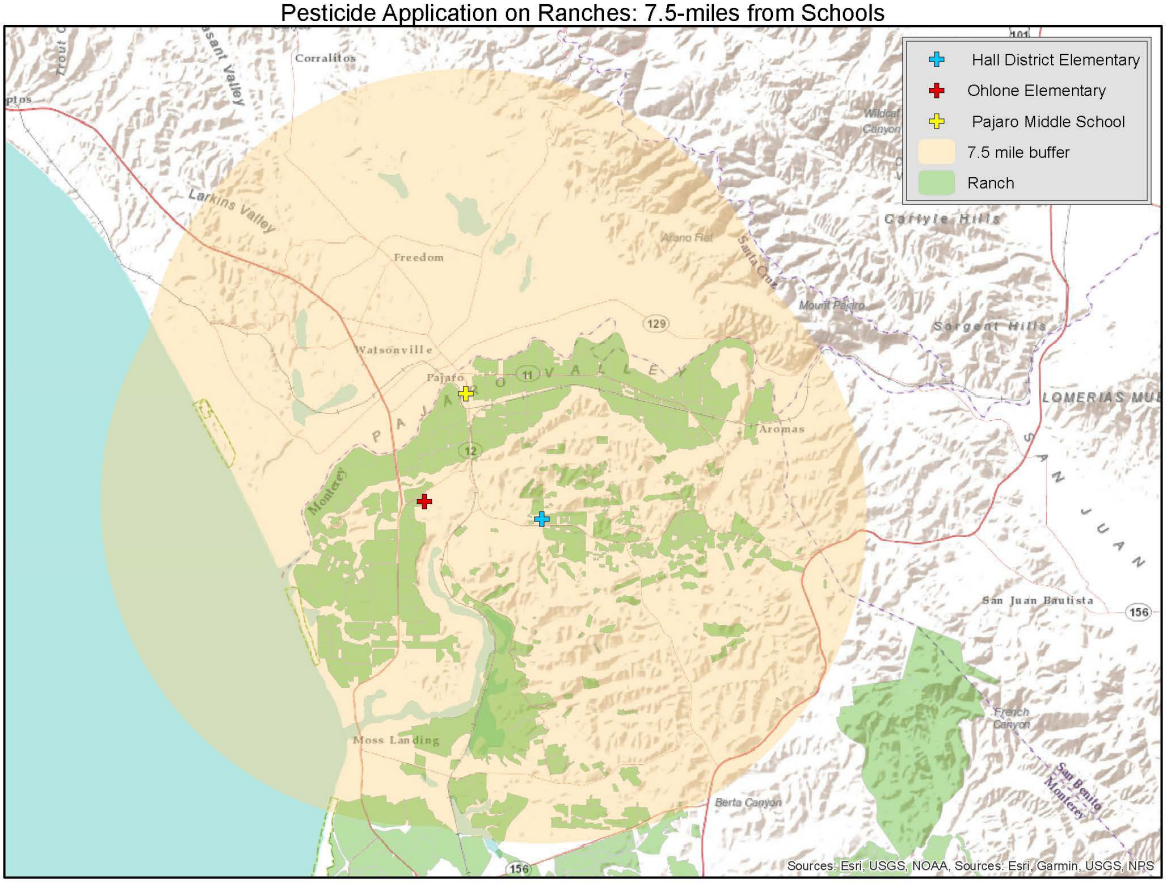
Fourth, the fact that the Commissioner authorized (a) 6 permits covering 8 ranches and 8 restricted materials with common modes of action[72] within a one-mile radius of Ohlone Elementary School, including multiple permits authorizing application of the same pesticide,[73] (b) 7 permits covering 10 ranches and 8 restricted materials with common modes of action within a one-mile radius of Pajaro Middle School, including multiple permits authorizing application of the same pesticide, and (c) 4 permits covering 6 ranches and 7 restricted materials with common modes of action within a one-mile radius of Hall District Elementary School demonstrates the likelihood of cumulative impacts.

Additionally, the area in the "vicinity" of these schools likely to suffer substantial adverse effects from pesticide applications is much larger than one mile, as discussed above. If the Commissioner were to review its records out to a 7.5-mile radius from each of the schools discussed herein, the existence of cumulative impacts would become even more apparent. For example, the Commissioner issued a 2022-2023 permit to Rancho Espinoza, Inc. (no. 2700664), including for 330 D Berry Road Ranch, which is located just outside the one-mile radius from Hall District Elementary School, and which authorizes application of carbaryl and paraquat, both of which are also authorized in the challenged Glez Farms permit.

Moreover, as the following map illustrates, the entire universe of focus of this appeal exists in a confined geographic area, with Ohlone Elementary School, Pajaro Middle School, and Hall District Elementary School collocated in close proximity to one another. For example, Hall District Elementary School is approximately 1.5 miles from Ohlone Elementary School and less than 2 miles from Pajaro Middle School, and Ohlone Elementary School is located about 2 miles from Pajaro Middle School. Accordingly, all of the challenged permits should be examined together to assess cumulative impacts to the Pajaro Valley region.

[72] *See Guide* at 85 (acknowledging the potential for cumulative impacts from different pesticides with common modes of action).
[73] *See PANNA*, 16 Cal. App. 5th at 248 (discussing the importance of considering "incremental effects" associated with "past, current or future approved projects").

Pesticide Application on Ranches: 7.5-miles from Schools



As a proper environmental impacts analysis would have confirmed that "a substantial adverse environmental impact *may* result"[74] from use of the restricted materials approved in the permits, the law precluded the permits' approval without confirmation that such pesticide use would be limited to "situations in which it is reasonably certain that no injury *will* result."[75] As discussed below, the Commissioner failed in this task by failing to conduct a proper mitigation analysis.

B. The Commissioner Failed to Properly Evaluate Whether Potential Impacts Are Controllable by Mitigation.

Consideration of environmental impacts is part of a sequential process that cannot be completed out of order. Because the Commissioner failed to identify potential environmental impacts, the Commissioner necessarily also failed in his duty to evaluate whether such impacts are controllable by mitigation. The Commissioner may *not* issue a restricted material permit if the pesticide "has demonstrated serious uncontrollable adverse effects either within or outside the agricultural environment"—i.e., if "no restrictions are available to mitigate that harm."[76] Moreover, as with the previous categories, the boilerplate in the permits concerning the

[74] Cal. Code Regs., tit. 3, § 6432(a) (emphasis added).
[75] Cal. Food & Agric. Code § 14006 (emphasis added).
[76] Cal. Food & Agric. Code §§ 14006.5, 12825(a)-(c); *What You Need To Know* at 2.

applicants' attestation that they have "considered…mitigation measures" and adopted "those that are feasible and would substantially lessen any significant adverse impact on the environment" would provide no basis for the *Commissioner's* approval—regardless of a parallel impacts discussion—without an explanation of *what* those mitigation measures were and *how* they mitigated those impacts.

For similar reasons, the Commissioner cannot rely on standard permit conditions to claim that impacts will be mitigated where the Commissioner has failed to analyze what those impacts actually are. Indeed, the permit boilerplate recognizes that "[i]ndividual permits may contain more restrictive conditions" than the standard terms, and the whole purpose of the Commissioners' permitting system is to ensure an individualized review based on location-specific information.

In fact, air quality monitoring data and reports of pesticide illnesses demonstrate that drift continues to occur, and members of frontline communities continue to suffer harm, despite permits being issued with standard mitigation conditions (such as use of a certified applicator, submitting a NOI for each application, limitations on fixed-wing aerial applications near residences, and a ban on applications within 0.25 mi. of schools and daycares from 6am-6pm on Monday through Friday).

For example, as discussed above, air quality monitoring data from Ohlone Elementary School confirmed annual average 1,3-D levels exceeded the current OEHHA safe harbor level in every year going back to 2012 (the year the monitoring began), and the Department's own records document drift from 1,3-D at distances of 7.5 miles away at highly toxic concentrations.

To the extent the Department and/or Commissioner have additional standard fumigant conditions, including conditions related to the size of treatment blocks and tarping of application sites, data available from the California Pesticide Illness Query ("CalPIQ") database confirms that such conditions are far from foolproof. Between 2012 and 2018 (the most recent year published online), there were a total of 219 incidents involving 1,3-D, with 157 of those incidents occurring in Monterey County; and a total of 349 incidents involving chloropicrin, with 168 of those incidents occurring in Monterey County. While some incidents were isolated, the reports reflected a number of mass casualty events, including events involving offsite movement of 1,3-D that sickened roughly 40 to 50 nearby fieldworkers in Monterey County in both 2012 and 2013.[77]

The 2012 incident affected two harvest crews working close to a pre-plant strawberry field (920 feet away and 2,240 feet away) that had been fumigated the previous day. Reported symptoms included burning and tearing eyes, rash on arms and back, nausea, dizziness, shortness of breath, headache, sore or itchy throat, blurred vision, irritated nose, cough, and numb lips. The temperature on the day of fumigation was "unexpectedly high" with "minimal" nighttime air movement and a "slight" breeze blowing toward the fieldworkers at the time of exposure.

[77] Department of Pesticide Regulation, *CalPIQ Database, Case Nos. 2012-1376 to 2012-1427; Case Nos. 2013-1106 to 2013-1134 and 2013-1432 to 2013-1467*. https://apps.cdpr.ca.gov/calpiq/calpiq_input.cfm?.

The 2013 incident occurred when "strong winds" blew off a tarp from a recently fumigated strawberry field about 420 feet from nearby fieldworkers. One of the workers noticed a "bubble" in the tarp before it blew away. The bubble became a "large tear." Wind speeds may have exceeded 9.6 miles per hour. A fumigation buffer zone was supposed to extend to the area where the workers were working, but no signs were posted and no one notified the workers. Soil conditions may also have contributed to the tarp's failure. The workers reported symptoms similar to the 2012 incident, along with difficulty swallowing, vomiting, congestion, chest tightness, weakness, facial swelling, and the "sensation of being suffocated." One worker with a history of seizures also experienced syncope, abnormal gait, and nonintact extraocular movement, and had a seizure after returning to work after 10 days.

Additionally, in 2017, a county inspector observed 10 workers in a 30-foot buffer zone, with 8 of the 10 experiencing symptoms of pesticide exposure. Responses to Public Records Act requests confirm that similar incidents have continued more recently, including an incident involving 1,3-D and chloropicrin that sickened a crew of 33 fieldworkers and their leader in 2018; an incident involving the same fumigants that sickened 20 residents and 3 firefighters in 2020; and another incident that sickened 10 residents in 2020.[78]

Moreover, standard mitigation conditions fail to account for the added harm associated with cumulative impacts from applying the same restricted pesticides on multiples sites in a concentrated geographic area, and the cumulative impacts associated with applying multiple different pesticides in the same general area where the pesticides have common modes of action. Boilerplate mitigation conditions are simply insufficient to fulfill the Commissioner's statutory mandate under the Food and Agricultural Code and CEQA to use his specialized knowledge of Monterey County to condition restricted materials permits on limits based on realtime, on-the-ground data, as necessary to protect human health and the environment.

C. The Commissioner Failed to Weigh the Potential Human Health Costs Against the Public Value of the Permit.

While the Food and Agricultural Code precludes issuance of restricted materials permits involving pesticides whose costs in terms of human health and environmental detriment outweigh their public value,[79] the preceding sections establish the applicants' and Commissioner's failure to evaluate environmental impacts. It is simply impossible for the Commissioner to conduct the required cost-benefit analysis in terms of whether the public value outweighs environmental detriment without first analyzing environmental detriment. In addition, the permits contain no discussion regarding their public value. Accordingly, denial of the permits was also necessary for their failure to satisfy the cost-benefit standard.

D. The Commissioner Failed to Conduct a Proper Alternatives Analysis.

Without an accurate understanding of environmental impacts, as discussed above, it is impossible to determine whether and to what extent alternatives exist. Additionally, the permits

[78] Department of Pesticide Regulation, *CalPIQ Database, Case Nos. 2018-1306, 2020-1219, 2020-1267*.
[79] Cal. Food & Agric. Code §§ 14006.5, 12825(a)-(b).)

discuss alternatives only in superficial terms. As with impacts and mitigation, the permits contain the applicants' boilerplate assertions that *the applicants* considered alternatives. While the permits provide a list of the alternatives allegedly considered, they contain no detail explaining why the applicants rejected those alternatives as infeasible. Accordingly, issuance of the permits was in violation of law.[80]

Under a certified regulatory program, "the public agency bears the burden of affirmatively demonstrating that, notwithstanding a project's impact on the environment, the agency's approval of the proposed project followed meaningful consideration of alternatives."[81] This is especially so because "consideration of alternatives is one of the hallmarks of CEQA analysis."[82] The alternatives analysis continues to apply to "any functionally equivalent document prepared in a certified program."[83] Thus, "a legally sufficient [environmental review document] *must* include some consideration of feasible alternatives *even if* the project's significant environmental impacts will be avoided through mitigation measures."[84]

Here, the permits direct the applicants to elaborate on their consideration of two categories of alternatives: (1) non-chemical pest management practices alternatives "such as, but not limited to, hand weeding or mowing; orchard floor sanitation to remove mummy nuts or berries; timing pruning to minimize chance of fungal infection; or trapping, habitat modification, and use of predators for rodent control"; and (2) "[r]educed risk chemical alternatives such as, but not limited to non-restricted pesticide products, certified organic or [Federal Insecticide, Fungicide, and Rodenticide Act] section 25(b) exempt/minimum risk pesticide products." The entirety of each operator's response appears in the following chart:

Operator	**Non-chemical pest management**	**Reduced risk chemical alternatives**
1. Akiyama Nursery (permit no. 2700010)	No statement of alternatives provided with permit materials.	
2. Coastal Vista Farms LLC (permit no. 2701314)	"Predators[,] mites[,] Vacuum Trapping"	"Certified Organic Low Risk Pesticides"
3. Driscoll's Research (permit no. 2700147)	Statement of alternatives left blank.	
4. Glez Farms (permit no. 2700199)	"Hand Weeding, Yellow Sticky Traps" (original permit) "Field Rotation, [n]ematode damples [sic]" (1,3-D supp.) No statement of alternatives provided with KPAM fumigant supplement.	"Non-Restricted Pesticide Products Certified Organic" (original permit) "Non-restri[c]ted pesticide products" (1,3-D supp.)
5. Growers Transplanting, Inc. (permit no. 2700216)	"Persim[ili]s"	"Persimil[i]s"

[80] Pub. Res. Code § 21080.5(a), (d)(3)(A).
[81] *PANNA*, 16 Cal.App.5th at 245 (citation omitted).
[82] *Id.* (citation omitted).
[83] *Id.* (citation omitted).
[84] *Friends of the Old Trees v. Dep't of Forestry & Fire Prot.*, 52 Cal. App. 4th 1383, 1395 (1997).

6. Jacco Farms (permit no. 2701052)	"Using persimilis and vacuum"	"NA"
7. Jal Berry Farms (permit no. 2700253)	"Predatos bug bacium tramos" [sic]	"Captan Serenade sulf[u]r"
8. Lopez Flowers (permit no. 2700310)	"Cover crop"	"Pageant"
9. R. Montañez Farms LLC (permit no. 2700544)	"muestras de tierra [soil samples], analises de planta [plant analysis], rotasion de bloques [crop rotation], usamos vaquium [using a vacuum], trampas [traps]"	"Productos que no estan restinguidos [non-restricted products]"
10. Royal Oaks Farms, LLC (permit no. 2700482)	"discing for weeds"	"Predators release"
11. Satsuma Farms, LLC (permit no. 2700493)	"deblooming, use of [persimilis], hand weeding, cutting runners, setting traps. and owl boxes"	"using ASD (Anaerobic Soil Disinfestation)"
12. Willoughby Farms, Inc. (permit no. 2700614)	"Disking, hand weeding, mowing, scraping of roads and borders for weed control. Fencing and trapping for rodent control."	"We always try to use reduced risk chemical alternatives when applicable before we use a restricted material."
13. Yamaoka Brothers (permit no. 2700617)	"Hand weeding and discing weeds"	"use non restricted chemicals when possible"

The lack of elaboration regarding the alternatives allegedly considered and the reasons why the operator rejected them—such as an explanation regarding the alternatives' inability to reduce the risk of the potential environmental impact or why they would be infeasible to implement—precluded the Commissioner's meaningful review. Indeed, the only conclusion that can be drawn from the above chart is that a range of alternatives in both the "non-chemical pest management" and "reduced risk chemical alternatives" categories actually exist.

Further, it is important to emphasize that none of the permits considered, much less evaluated the potential environmental impact of, a "no action" alternative, which would have been relevant to the environmental cost-public value requirement discussed above by providing information such as percentage of crop loss that could be expected in the absence of any pesticide application, and would have provided a baseline for comparison purposes when evaluating the feasibility of other alternatives, such as those identified in the chart above.

The 2019 UCLA *Governance on the Ground* report confirms that these issues are widespread and long-running. In particular, the 2019 report reflected a lack of office-specific guidance as to alternatives evaluation, a typical practice of delegating responsibility for such task to the permit applicant or its pest control advisor, and an absence of evidence that Commissioners engage in significant oversight,[85] which the above analysis confirms is still the case in Monterey County.

The Commissioner's failure to meaningfully evaluate a range of reasonable alternatives amounts to a fundamental violation of CEQA and necessitates reversal of the Permits' approval.

[85] *Governance on the Ground* at 2.

E. Notices of Intent Cannot Cure the Deficiencies Identified Herein.

While the permits assert that the Commissioner will review NOIs to determine "whether any environmental conditions have changed since the permit was issued," the Commissioner cannot defer a proper impacts analysis to the NOI stage. The purpose of a NOI is for the Commissioner to evaluate whether baseline conditions have changed, but the Commissioner cannot make such a determination without knowing what the baseline conditions were in the first place. Accordingly, the NOI's focus is limited to application-specific information that was truly unavailable at the time of the permit's issuance.[86] The Department's implementing regulations specify that the only categories of information allowable in an NOI in lieu of the permit application are dates of application, method of application (i.e., "dilution, volume per acre…and dosage"), and the identity of the certified applicator.[87] A sampling of NOIs (included as Attachment 4 to this request) confirms their narrow scope in practice and their unsuitability as a substitute for proper CEQA review.

By contrast, the Commissioner's duty to conduct environmental review of a restricted materials permit application is a standalone obligation. In particular, the Commissioner has a statutory duty to *deny* permit applications where (a) the pesticide "has demonstrated serious uncontrollable adverse effects either within or outside the agricultural environment," (b) the pesticide has costs in terms of environmental detriment that outweigh the public value of its use, or (c) "there is a reasonable, effective, and practicable alternate material or procedure that is demonstrably less destructive to the environment."[88] Any permit issued without a "well-substantiated and documented"[89] determination as to controllability of adverse effects (i.e., mitigation), cost-benefit, and practicable alternatives is, thus, *ultra vires*.

For these reasons, the Commissioner's failure to fulfill his duties prior to issuing a restricted materials permit necessarily renders that permit void. Due to such noncompliance in the present matter, all of the challenged permits must be reversed.

IV. The Commissioner Must Stay All Pesticide Applications within One Mile of the Affected Schools Pending Review of the Permits at Issue.

The Commissioner's permitting practices have made it incredibly difficult for members of the public concerned with applications in a specific geographic area to gain an accurate understanding of the true universe of restricted pesticide applications that will occur during a permit year. In particular, the Commissioner routinely issues restricted materials permits around or about January of each calendar year despite knowing or having reason to believe that many such permits are incomplete due to the applicants' failure to disclose their intention to apply restricted fumigants. Instead, it is the Commissioner's practice to add fumigants such as 1,3-D and chloropicrin to the permits through "supplements" issued around or about July through

[86] *Monterey Gen. Permit Conditions*, § A1-NOI.
[87] Cal. Code Regs., tit. 3, § 6434(b) (cross referencing section 6428(g)-(i)).
[88] Cal. Food & Agric. Code §§ 14006.5, 12825(a)-(c).
[89] *What You Need To Know* at 2.

September of each calendar year, which supplements are lacking in further meaningful environmental review.

As fumigations typically occur during the fall, it is likely that there will only be a short window between the filing of this appeal and the submittal of NOIs to apply fumigants associated with the challenged permits. Additionally, as fumigants are among the most harmful of all restricted materials, with the greatest environmental impacts, an objection to their intended application within one mile of the schools listed above forms a key part of this request for review.

There is no basis in law for the Commissioner's practice of facilitating concealment from the public of operators' intent to apply restricted fumigants by allowing—and, on information and belief, requiring—applicants to omit this information from their initial permit applications. The Commissioner's practice of approving permits that it knows or has reason to know are incomplete due to lack of fumigant information is itself an abuse of discretion.

As waiting until after the fumigant supplements become available enables Community Groups to fulfill the important role of private attorneys general by exposing deficiencies in the permitting process and holding the Commissioner to his mandate, the Commissioner should stay any and all permits subject to this request for review—i.e., all permits authorizing applications of restricted materials within one mile of Ohlone Elementary School, Pajaro Middle School, and Hall District Elementary School—until after a full and final resolution of the matters contained herein.

The regulations support the granting of a stay for good reasons.[90] In addition to the logistical reasons identified above, a stay is also necessary here "to avoid a significant health hazard"[91] to schoolchildren, teachers, farmworkers, and residents, which cumulative application of 1,3-D, chloropicrin, and other restricted materials will undoubtedly cause due to the approval of their use in the permits and their supplements without adequate environmental review.

[90] Cal. Code Regs., tit. 3, § 6442(d).
[91] *Id.*

V. Conclusion

Based on the above, we request that you review and rescind all permits issued by your office that allow the application of restricted materials within one mile of (1) Ohlone Elementary School, (2) Pajaro Middle School, and (3) Hall District Elementary School, including the specific permits set forth above. We further ask that you stay all restricted materials permits within a one-mile radius of these three schools pending your review.

Sincerely,

Elizabeth A. Fisher
Gregory C. Loarie
Radhika Kannan
Counsel for Californians for Pesticide Reform, Center for Farmworker Families, Monterey Bay Central Labor Council, Pajaro Valley Federation of Teachers, and Safe Ag Safe Schools

Enclosures:

- Attachment 1 – Targeted Permits Combined_2022
- Attachment 2 – Targeted Permits Combined_2021
- Attachment 3 – Sources Cited
- Attachment 4 – Sampling of Notices of Intent

Appendix A

Data in Compliance with Section 14009 of the Food & Agricultural Code

Permit Number	Operator Name/Address	Agent Name/Address	Ranch(es)	Schools within 1 mi.	Restricted Materials
2700010-2022	Akiyama Nursery 471 Elkhorn Rd. Royal Oaks, CA 95076	Ben Akiyama 471 Elkhorn Rd. Royal Oaks, CA 95076	▪ 471 Elkhorn Rd (site 1)	▪ Ohlone	▪ Aluminum Phosphide ▪ Paraquat Dichloride
2701314-2022	Coastal Vista Farms LLC 10801 Axtell St. Castroville, CA 95012	Henry Leal Arturo Lopez 10801 Axtell St. Castroville, CA 95012	▪ Skillicorn (site 4) ▪ Kennedy (site 8)	▪ Ohlone ▪ Pajaro	▪ Carbaryl ▪ Aluminum Phosphide ▪ 1,3-D ▪ Chloropicrin
2700147-2022	Driscoll's Research 151 Silliman Rd. Watsonville, CA 95076	Arnulfo Figueroa 404 San Juan Rd. Watsonville, CA 95076	▪ 404 San Juan Rd (site 1)	▪ Pajaro	▪ Carbaryl ▪ Methomyl
2700199-2022	Glez Farms P.O. Box 2553 Watsonville, CA 95077	Francisco Gonzalez 17000 Blackie Rd. Prunedale, CA 93907	▪ Ranch 10 (site 1) ▪ Ranch 20 (site 2) ▪ Ranch 15 (site 15)	▪ Hall ▪ Hall ▪ Hall	▪ Carbaryl ▪ Malathion ▪ Aluminum Phosphide ▪ Paraquat Dichloride ▪ 1,3-D ▪ Chloropicrin ▪ Potassium N-methyldithiocarbamate
2700216-2022	Growers Transplanting, Inc. P.O. Box 3756 Salinas, CA 93912	Jorge Mendez 360 Espinosa Rd. Salinas, CA	▪ Pajaro Valley (site 4)	▪ Pajaro	▪ Aluminum Phosphide ▪ Zinc Phosphide
2701052-2022	Jacco Farms 510 Hall Rd. Watsonville, CA 95077	Jorge Castro 510 Hall Rd. Watsonville, CA 95077	▪ Las Lomas (site 1)	▪ Hall	▪ 1,3-D ▪ Chloropicrin
2700253-2022	Jal Berry Farms 411 Walker St. Watsonville, CA 95076	Lopez, Jose 411 Walker St. Watsonville, CA 95076	▪ McGowan (site 4)	▪ Pajaro	▪ 1,3-D ▪ Chloropicrin
2700310-2022	Lopez Flowers 500 Hall Rd.	Lopez, Isaias 500 Hall Rd.	▪ 500 Hall Rd (site 1)	▪ Hall	▪ 1,3-D ▪ Chloropicrin

	Royal Oaks, CA 95076	Royal Oaks, CA 95076			
2700544-2022	R. Montañez Farms LLC P.O. Box 1199 Watsonville, CA 95077	Adan Cruz 121 Hall Rd. Watsonville, CA 95076	▪ Pini (site 8)	▪ Hall	▪ 1,3-D ▪ Chloropicrin ▪ Potassium N-methyldithiocarbamate
2700482-2022	Royal Oaks Farms, LLC P.O. Box 399 Watsonville, CA 95077	David Ortiz & Felipe Villalobos 235 San Juan Rd. Watsonville, CA 95076	▪ Royal Oaks East (site 10) ▪ Maladin/Pajaro (site 14) ▪ Allison (site 15) ▪ Royal Oaks West (site 11)	▪ Ohlone ▪ Pajaro ▪ Pajaro ▪ Ohlone	▪ Aluminum Phosphide ▪ 1,3-D ▪ Chloropicrin
2700493-2022	Satsuma Farms, LLC P.O. Box 430 Watsonville, CA 95077	Rich Uto 1277 Salinas Rd. Moss Landing, CA 95039	▪ San Cayetano (site 1) ▪ Peterson (site 3)	▪ Ohlone ▪ Ohlone	▪ Aluminum Phosphide ▪ Potassium N-methyldithiocarbamate
2700614-2022	Willoughby Farms, Inc. P.O. Box 82 Watsonville, CA 95077	Shawn R. Harden 261 Coward Rd. Watsonville, CA 95076	▪ Cox (site 3) ▪ Crosseti (site 26)	▪ Ohlone ▪ Pajaro	▪ Carbaryl ▪ Oxydemeton-Methyl ▪ Methomyl ▪ Aluminum Phosphide ▪ Paraquat Dichloride
2700617-2022	Yamaoka Brothers 1942 San Juan Hollister Hwy. San Juan Bautista, CA 95045	Dennis Yamaoka 1942 San Juan Hollister Hwy. San Juan Bautista, CA 95045	▪ Kennedy (site 2) ▪ McGowan (site 3) ▪ Porter/Kelly (site 5)	▪ Pajaro ▪ Ohlone & Pajaro ▪ Pajaro	▪ Carbaryl ▪ Oxydemeton-Methyl ▪ Methomyl

Appendix B

Environmental Impacts of Restricted Materials

By way of background, the following list provides factual information regarding each of the restricted materials listed in the challenged 2022 Permits, along with restricted materials reasonably likely to be added to some or all of the Permits via supplementation, based on past pattern and practice. After first identifying sensitive receptors who could be impacted by the application of pesticides on the ranches included, these are the kinds of details that the applicants and Commissioner should be considering when evaluating potential environmental impacts.

1,3-Dichloropropene

1,3-D (trade name "Telone") is a soil fumigant used to address parasitic nematodes. It is a restricted material due to "high acute inhalation toxicity and carcinogenicity."[92] 1,3-D has a half-life of up to 69 days in soil, and dissipation primarily occurs via volatilization, leaching, abiotic hydrolysis, and aerobic soil metabolism, with air being the primary source of exposure.[93] EPA characterizes 1,3-D as a "likely" human carcinogen.[94]

A Hazard Summary prepared by EPA (created in 1992 and updated in 2000) indicates that short-term inhalation exposure in humans is associated with cough, mucous membrane irritation, chest pain, and breathing difficulties, with studies also showing lung and neurotoxic effects from acute exposure in rats.[95] Chronic effects documented in humans include skin sensitization, and chronic effects shown in rats include damage to the nasal mucosa and urinary bladder. Additionally, "[t]wo cases of histiocytic lymphomas and one case of leukemia have been reported in emergency response personnel exposed to concentrated 1,3-dichloropropene vapors during cleanup of a tank truck spill." The U.S. Department of Health and Human Services and the state of California have determined that 1,3-D is reasonably anticipated to be a human carcinogen.[96]

The Pesticides Properties Database maintained by the University of Hertfordshire in the United Kingdom identifies 1,3-D as "moderately toxic" to mammals, birds, honeybees, earthworms, and most aquatic species.[97] The database includes "high" alerts for acute ecotoxicity in birds and

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[92] U.S. Environmental Protection Agency, *Specimen Label: Pic-Clor 15* (Accepted Jun. 21, 2007). https://www3.epa.gov/pesticides/chem_search/ppls/008536-00021-20070621.pdf.
[93] U.S. Environmental Protection Agency, *Health Effects Support Document for 1,3-Dichloropropene* (January 2008) at 1-1 to 1-2. https://www.epa.gov/sites/default/files/2014-09/documents/health_effects_support_document_for_13_dichloropropene.pdf.
[94] U.S. Environmental Protection Agency, *Integrated Risk Information System, 1,3-Dichloropropene* (website updated July 28, 2017). https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=224.
[95] U.S. Environmental Protection Agency, *1,3-Dichloropropene: Hazard Summary* (updated Jan. 2000). https://www.epa.gov/sites/default/files/2016-09/documents/1-3-dichloropropene.pdf.
[96] Agency for Toxic Substances and Disease Registry, *Public Health Statement for Dichloropropenes* (website updated March 12, 2015). https://wwwn.cdc.gov/TSP/PHS/PHS.aspx?phsid=834&toxid=163; Lily Dalton, *Dangerous Drift*, California Health Report (Sep. 2, 2015). https://www.calhealthreport.org/2015/09/02/dangerous-drift/.
[97] Kathleen A. Lewis et al., *An international database for pesticide risk assessments and management,* Human and Ecological Risk Assessment: An International Journal (updated March 3, 2022). http://sitem.herts.ac.uk/aeru/ppdb/en/Reports/1.htm.

chronic ecotoxicity in fish. As of 1998, scientific estimates indicated that roughly 672 million birds experienced pesticide exposure annually on agricultural lands in the United States, with 10%—67 million—killed outright as a result of pesticide ingestion.[98]

According to the product label for Telone II, 1,3-D has the potential to contaminate groundwater "in areas where soils are permeable and groundwater is near the surface." EPA included 1,3-D on its Second Contaminant Candidate List under the Safe Drinking Water Act Amendments of 1996, but ultimately determined that regulatory action for 1,3-D was neither necessary nor appropriate. (73 Fed. Reg. 44251 (July 30, 2008).) EPA completed a 15-year interim registration review of 1,3-D in October 2020. (85 Fed. Reg. 67533 (Oct. 23, 2020).)

Aluminum Phosphide

Aluminum phosphide is a fumigant used in burrows to control rodents and moles. The active chemical is phosphine gas, which is created when aluminum phosphide reacts with moisture in the atmosphere. EPA labels aluminum phosphide as Toxicity Category I, "the highest (most toxic) of four categories, for acute effects via the inhalation route." The half-life in air is approximately five hours, but the dark half-life is approximately 28 hours. Due to its toxicity, the use of aluminum phosphide is "strictly prohibited [in California] around all residential areas, including single and multi-family residential properties, nursing homes, schools (except athletic fields, where use may continue), day care facilities, and hospitals."[99]

People may be exposed to aluminum phosphide primarily through inhalation. Acute overexposure can lead to rapid onset of nausea, gastric pain and vomiting, hypotension, skeletal muscle injury, edema, headaches, dizziness, and in severe cases, acute renal and liver injury.[100] Repeated exposure can damage lungs, kidneys, and liver.[101] Repeated exposure can also cause serious bronchitis.[102]

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[98] Mary Deinlein, *When it Comes to Pesticides, Birds are Sitting Ducks,* Smithsonian's National Zoo & Conservation Biology Institute (Jan. 1, 1998). https://nationalzoo.si.edu/migratory-birds/news/when-it-comes-pesticides-birds-are-sitting-ducks.

[99] Mary-Ann Warmerdam, *Update: Aluminum and Magnesium Phosphide Rodenticides/New Approved Labeling Amendments and Questions and Answers*, California Department of Pesticide Regulation (April 8, 2011). https://www.cdpr.ca.gov/docs/county/cacltrs/penfltrs/penf2011/2011011.htm#:~:text=Aluminum%20and%20magnesium%20phosphide%20products%20have%20been%20restricted%20in%20California,magnesium%20phosphide%20product%20labeling%20changes.

[100] Oregon State University, *Inhalation Risks from Phosphide Fumigants*, National Pesticide Information Center (visited September 20, 2022). http://npic.orst.edu/mcapro/phosphine.html.

[101] New Jersey Department of Health and Senior Services, *Hazardous Substance Fact Sheet: Aluminum Phosphide* (Rev. June 2005). https://www.nj.gov/health/eoh/rtkweb/documents/fs/0063.pdf.

[102] *Id*.

Carbaryl

Carbaryl is one of the most frequently used carbamate insecticides and widely used for the control of a variety of pests on more than 120 different crops.[103]

People may be exposed to carbaryl through inhalation or dermal absorption. Acute toxicity of carbaryl might result in nausea, vomiting, bronchoconstriction, blurred vision, and convulsions.[104] Chronic effects of carbaryl in small doses can decrease the kidney's ability of adsorb amino acids and cause abdominal cramping.[105] Similar doses have been shown to cause kidney abnormalities, reduced heart rates, and reduced blood clotting in animal tests.[106]

The EPA considers carbaryl to be likely carcinogenic due to causing tumors in rats.[107] Children, pregnant women, older persons and immune-compromised individuals are more prone to the effects of carbaryl.[108] Indeed carbaryl has been found to be associated with childhood brain cancer.[109]

While carbaryl successfully causes the death of insects by paralysis and does not persist in the environment, it has also been shown to have negative effects on the development of several nontarget species.[110] The compound is easily hydrolyzed and can contaminate marine environments. As such, research indicates that they carbaryl may irreversibly alter the reproduction of aquatic organisms and is toxic to the water flea, shrimp, freshwater snail and certain fish.[111] As such, carbaryl "should not be used in bodies of water or in fields adjoining those bodies, particularly in the rainy season."[112] In soils, carbaryl is highly toxic to bees, helpful insects, and earthworms. [113]

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[103] Sue Xu, *Environmental Fate of Carbaryl,* California Department of Pesticide Regulation (2000). https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.639.3076&rep=rep1&type=pdf.
[104] Beyond Pesticides, *ChemicalWATCH Factsheet: Carbaryl* (updated March 2001). https://www.beyondpesticides.org/assets/media/documents/pesticides/factsheets/Carbaryl.pdf.
[105] Sierra Club, *Pesticide Fact Sheet: Carbaryl* (last accessed October 10, 2022) (hereafter *SC Carbaryl Fact Sheet).* https://www.sierraclub.ca/national/programs/health-environment/pesticides/carbaryl-fact-sheet.shtml.
[106] *Id*.
[107] U.S. Environmental Protection Agency, *Carbaryl Fact Sheet,* (updated Jan. 2000). https://www.epa.gov/sites/default/files/2016-09/documents/carbaryl.pdf.
[108] *SC Carbaryl Fact Sheet*.
[109] Meriel Watts, *A PANAP Factsheet Series Highly Hazardous Pesticides: Carbaryl*, Pesticide Action Network Asia and the Pacific (June 2014) (hereafter *PANAP Factsheet: Carbaryl)*. https://panap.net/resource/20-pesticides-toxic-to-children-factsheet-carbaryl/?wpdmdl=2157&refresh=625dc1f4498b41650311668. (Citing Shelia Hoar Zahm & Mary H. Ward, *Pesticides and childhood cancer*, Environ Health Perspect 106(Suppl 3):893-908 (1998).)
[110] Elizabeth N. Schock et al., *The effects of carbaryl on the development of zebrafish (Danio rerio) embryos*, Zebrafish (December 2012). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3528089/.
[111] Amrith Gunasekara, *Environmental Fate of Carbaryl*, Department of Pesticide Regulation (2008) at 16. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.639.3284&rep=rep1&type=pdf.
[112] *Id*.
[113] *PANAP Factsheet: Carbaryl*.

Chloropicrin

Chloropicrin (PS) is used in agriculture as a soil fumigant. It was also previously used as a chemical warfare agent during World War I and as a riot control agent. Chloropicrin is toxic via all routes of exposure (including ingestion and dermal absorption) but the main route of systemic exposure is inhalation.[114]

Acute exposure (even in low doses) can lead to serious eye irritation, burns in the mouth, nausea, vomiting, difficulty breathing, headache, dizziness, discoloration of the skin, and profound inflammation of the lower respiratory tract with potentially fatal accumulation of fluid in the lungs. There are only a few relevant human studies on chronic toxicity or carcinogenicity of chloropicrin. Animal experiments have shown decreases in organ and body weights, reproductive complications such as increased implantation losses and late abortion, and an increased incidence of pulmonary adenomas and carcinomas based on chronic exposure.[115]

Studies have shown that chloropicrin used in irrigation lines for post-application water treatment have contributed to such considerable health problems in local communities.[116] The same study found that the health problems "occurred between 0.36 and 2.89 miles" from the application site. The study concluded that the use of chloropicrin can produce a risk of illness "for distances more than 2 miles from the site of application."[117]

The EPA has found that Chloropicrin is highly soluble in water and has low adsorption in soil thus making it more likely that it can potentially leach into groundwater or reach surface water as a result of heavy rainfall events.[118] Because of its solubility, Chloropicrin is considered highly toxic to fish and aquatic organisms.[119] Indeed, Chloropicrin's labels contain a warning that applicators should use caution to avoid inadvertent discharges into lakes, streams, ponds, estuaries, oceans, or other waters.[120]

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[114] Maija Pesonen, *Chloropicrin-induced toxicity in the respiratory system*, Toxicology Letters (2020). https://erepo.uef.fi/bitstream/handle/123456789/8091/15863464692092539290.pdf;jsessionid=1BF4F9BEE1FEFA62CFC518CA1D5B7E9C?sequence=2.
[115] *Id*.
[116] Terrell Barry et al., *Community Exposure Following a Drip-Application of Chloropicrin*, Journal of agromedicine 15, 24-37 (2010).
[117] *Id*.
[118] U.S. Environmental Protection Agency, *RED Fact Sheet: Chloropicrin* (July 10, 2008). https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-081501_10-Jul-08.pdf.
[119] Ruth Douglas, *Letter re. Amended Request of Chloropicrin EPA Registration No. 62531-1* (April 30, 1994). https://www3.epa.gov/pesticides/chem_search/ppls/062531-00001-19940430.pdf.
[120] Trinity Manufacturing, Inc., *Product Safety Summary for Chloropicrin* (May 2, 2022). https://www.trinitymfg.com/Files/ProductSafety/Product_Safety_Summary_-_Chloropicrin_05-02-22_UPDATE.pdf.

Malathion

Malathion is an organophosphate insecticide used on a large variety of agricultural (food and feed crops) and non-agricultural sites.[121] It is also used to kill mosquitoes, Mediterranean fruit flies, and lice.[122]

In the environment, malathion is highly soluble in water and is known to cause trophic cascades that affect zooplankton and phytoplankton abundances.[123] Such trophic cascades have indirectly resulted in high amphibian mortality.[124] Indeed, exposure of aquatic environments to malathion is associated with a 30% decrease in species richness.[125] Due its high solubility, malathion is also highly toxic to many fish and aquatic invertebrates.[126] Terrestrially, malathion is highly toxic to bees and other pollinators and sub-lethal doses.[127] Laboratory data further indicates that malathion is potentially highly toxic to aquatic to birds.[128]

Human overexposure to malathion via inhalation or dermal absorption may cause severe poisoning or death.[129] Acute exposure can lead to difficulty breathing, chest tightness, vomiting, cramps, diarrhea, watery eyes, blurred vision, salivation, sweating, headaches, and dizziness. Based on extrapolated animal studies, researchers have found that chronic exposure to malathion could result in neurobehavioral and cognitive deficits.[130] Exposure to malathion is also associated with increased incidence of non-Hodgkin's lymphoma, metabolic disorders, oxidative stress,

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[121] U.S. Environmental Protection Agency, *Draft Malathion Human Health Assessment Available* (September 15, 2016). https://www.epa.gov/pesticides/epa-draft-malathion-human-health-assessment-available.
[122] Agency for Toxic Substances and Disease Registry, *Public Health Statement on Malathion* (hereafter *ATSDR Malathion Statement)* (September 2003). https://www.atsdr.cdc.gov/toxprofiles/tp154-c1-b.pdf.
[123] Australian & New Zealand Guidelines for Fresh & Marine Water Quality, *Malathion in freshwater and marine water* (October 2000) https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/toxicants/malathion-2000; Maya Groner, *A tale of two pesticides: how common insecticides affect aquatic communities*, Freshwater Biology (2011). https://www.biology.pitt.edu/sites/default/files/facilities-images/Groner.pdf.
[124] Rick Relyea, *An unforeseen chain of events: lethal effects of pesticides on frogs at sublethal concentrations*, University of Pittburgh (October 2018). https://pubmed.ncbi.nlm.nih.gov/18839767/.
[125] Rick Relyea, *The Impact of Insecticides and Herbicides on the Biodiversity and Productivity of Aquatic Communities,* Ecological Applications (2005). https://www.nrc.gov/docs/ML1434/ML14345A544.pdf.
[126] *Id*.
[127] Kathleen A. Lewis et al., *An international database for pesticide risk assessments and management,* Human and Ecological Risk Assessment: An International Journal (updated August 19, 2022). http://sitem.herts.ac.uk/aeru/ppdb/en/Reports/421.htm.
[128] U.S. Environmental Protection Agency, *Pesticide Fact Sheet: Malathion* (1988). https://nepis.epa.gov/Exe/ZyPDF.cgi/91024KYA.PDF?Dockey=91024KYA.PDF.
[129] *ATSDR Malathion Statement.*
[130] Alessandra Antunes dos Santos et al., *Long-term and low-dose malathion exposure causes cognitive impairment in adult mice*, Organ Toxicity and Mechanisms (Jan. 25, 2015). https://link.springer.com/article/10.1007/s00204-015-1466-0.

immunotoxicity, inflammation, and hepatotoxicity.[131] Malathion and has been found by the World Health Organization to be "probably carcinogenic to humans."[132]

Workers who apply technical grade malathion and other pesticides have higher levels of chromosomal damage than unexposed individuals.[133] Children, in particular, may be at greater risk of experiencing adverse effects from the application of malathion since they may have the potential for greater exposure than adults.[134] Indeed malathion is linked to developmental disorders and increases the risk of attention deficit hyperactivity disorder, or ADHD in children.[135] Indeed, a tenfold increase in malathion metabolite levels in urine — i.e., what would be considered a low exposure level — was associated with a 55% higher risk of having ADHD.[136]

Methomyl

Methomyl is a carbamate insecticide.[137] It is used for foliar treatment of vegetable and fruit crops.[138] Methomyl works both as a "contact insecticide," i.e., killing target insects upon direct contact and as a "systemic insecticide" i.e., overall "systemic" poisoning in target insects after absorption.[139]

It is classified as highly toxic compound for humans and animals by the EPA. In the environment, methomyl is highly toxic to wildlife, including fish, birds, and non-target insects like bees.[140] Indeed, exposure to methomyl is linked to death events of pigeons[141] and black-backed jackals.[142]

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[131] Paul B. Tchounwou et al., *Environmental Exposure and Health Effects Associated with Malathion Toxicity* (July 22, 2015). https://www.intechopen.com/chapters/48594.
[132] Center for Biological Diversity, *Lawsuit Seeks to Force EPA to Curb Risks from Dangerous Pesticide Malathion* (hereafter *CBD Press Release re. Malathion*) (May 30, 2018). https://www.biologicaldiversity.org/news/press_releases/2018/malathion-05-30-2018.php.
[133] Peter Flessel et al., *Genetic toxicity of malathion: A review*, Env. and Mol. Mutagenesis (1993).
[134] New York State Department of Health, *Information Sheet: Malathion and Mosquito Control* (updated October 2019). https://www.health.ny.gov/publications/2740/#:~:text=Is%20the%20spraying%20of%20malathion,vision%20and%20increased%20heart%20rate.
[135] *CBD Press Release re. Malathion*; Thomas Maugh, *Study links pesticide to ADHD in children*, Los Angeles Times (May 16, 2020). https://www.latimes.com/archives/la-xpm-2010-may-16-la-sci-pesticides-20100517-story.html.
[136] *Id.*
[137] Johan A. Desaeger et al., *Effect of methomyl and oxamyl soil applications on early control of nematodes and insects,* DuPont Crop Protection (May 2011). https://pubmed.ncbi.nlm.nih.gov/21438120/#:~:text=Background%3A%20Methomyl%20is%20a%20widely,potential%20of%20soil%2Dapplied%20methomyl.
[138] *Id*.
[139] Extension Toxicology Network, *Pesticide Information Profiles: Methomyl* (hereafter *ExToxNet Methomyl Profile)* (1996). http://extoxnet.orst.edu/pips/methomyl.htm.
[140] April Van Scoy, *Environmental Fate and Toxicology of Methomyl*, University of California (January 2013). https://www.researchgate.net/publication/230880016_Environmental_Fate_and_Toxicology_of_Methomyl.
[141] NSW Environmental Protection Agency, *EPA seeks information after pigeons killed by insecticide in Moree* (July 14, 2021). https://www.epa.nsw.gov.au/news/media-releases/2021/epamedia210714-epa-seeks-information-after-pigeons-killed-by-insecticide-in-moree#:~:text=%E2%80%9CThe%20toxicology%20results%20show%20that,in%20a%20range%20of%20crops.
[142] Kelly Starzak, *From South Africa to the US, wildlife needs protection from deadly pesticides,* Earth Touch News Network (August 21, 2014). https://www.earthtouchnews.com/conservation/human-impact/from-south-africa-to-the-us-wildlife-needs-protection-from-deadly-pesticides/.

The National Marine Fisheries Service has also found that methomyl jeopardizes the survival and recovery of endangered and threatened salmon and steelhead populations in Washington, Oregon, and California.[143] Methomyl has also been found to contaminate groundwater.[144] Furthermore, spray drift during application of methomyl can also contaminate surface water.[145]

Methomyl is most toxic orally and exposure may result in weakness, blurred vision, headache, nausea, abdominal cramps, chest discomfort, constriction of pupils, sweating, muscle tremors, and decreased pulse.[146] In severe cases, there may also be confusion, muscle incoordination, slurred speech, low blood pressure, heart irregularities, and loss of reflexes.[147] Death can also ultimately result from discontinued breathing and paralysis of muscles of the respiratory system.[148] Methomyl is also moderately toxic via inhalation and dermal absorption. Inhalation may cause irritation, lung and eye problems.[149] Via the dermal route, methomyl is absorbed only slowly through the skin and as such the onset of symptoms may take longer but would be similar to those induced by ingestion or inhalation will develop.[150] Chronic toxicity can result in inhibition of cholinesterase, resulting in flu-like symptoms, such as weakness, lack of appetite, and muscle aches.[151]

Handlers and workers may be exposed to methomyl via dermal absorption and inhalation.[152] Bystanders to pesticide agricultural applications may be exposed to airborne methomyl via the inhalation.[153] Levels of methomyl exposure may be problematic: acute absorbed daily dosages (ADDs) of methomyl for pesticide handlers ranged from 15 µg/kg/day for airblast applications to 1760 µg/kg/day for pilots.[154] Animal studies have shown that repeated exposure may result in neurotoxicity, kidney and liver damage, and endocrine disruption.[155]

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[143] Patti Goldman et al., *Pesticides in the Air – Kids at Risk: Petition to EPA to Protect Children from Pesticide Drift* (October 13, 2009). https://www.farmworkerjustice.org/wp-content/uploads/2012/08/Petition-Pesticides-in-the-Air-Kids-at-Risk.pdf.
[144] Herbiguide, *Information on Lannate-L and Methomyl.* http://www.herbiguide.com.au/Descriptions/hg_LANNATE_L.htm.
[145] U.S. Environmental Protection Agency, *EPA Correspondence and Information re. Alternate Brand Names for Methomyl* (December 17, 2012). https://www3.epa.gov/pesticides/chem_search/ppls/082557-00003-20121217.pdf.
[146] *ExToxNet Methomyl Profile.*
[147] *Id.*
[148] *Id.*
[149] *Id.*
[150] *Id.*
[151] *Id.*
[152] Miglena Stefanova-Wilbur, *Estimation of Exposure of Persons in California to Pesticide Products that Contain Methomyl*, California Environmental Protection Agency (January 2015). http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.733.193&rep=rep1&type=pdf.
[153] *Id.*
[154] *Id.*
[155] Beyond Pesticides, *Gateway on Pesticide Hazards and Safe Pest Management – Methomyl*. https://www.beyondpesticides.org/resources/pesticide-gateway?pesticideid=218.

Oxydemeton-Methyl

Oxydemeton-methyl (ODM) is an organic phosphate insecticide.[156] ODM is registered for foliar and bark treatment uses to control aphids, mites, and thrips.[157] The mechanism of toxicity is that of AChE inhibition at nerve terminals.[158]

ODM has high acute toxicity to aquatic invertebrates and is toxic to fish and birds.[159] OMD is highly water soluble and mobile leading to significant harmful residues in the environment.[160] ODM has also been reported to show central nervous system depressant activity, reproductive effects, genotoxic effects, and mutagenic effects.[161]

In the case of human exposure, OMD is toxic if swallowed, in contact with skin and by inhalation.[162] It is irritating to eyes.[163] Symptoms from exposure include anorexia; nausea; vomiting; diarrhea; excessive salivation; pupillary constriction; bronchoconstriction; muscle twitching; convulsions; coma; respiratory failure; perspiration; and pulmonary edema. The effects are cumulative.[164] Acute exposure is evidenced by rapid onset of blurred vision and constricted pupils.[165]

The main acute, short-term or long-term toxic effect is an inhibition of blood and brain cholinesterase activities in all tested mammalian species.[166]

In one study measuring such cholinesterase activity for 542 California agricultural pesticide applicators, approximately 5% (26 workers) had cholinesterase values at or below the California threshold values for removal from continued exposure.[167] Additionally, 8 of these 26 workers, 31.5%, had pesticide-related illnesses.[168]

The compound also has clear mutagenic properties in vitro but has no genotoxic potential in vivo.[169] Indeed, prenatal residential proximity to agricultural use of OMD use has also been

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[156] National Center for Biotechnology Information, *PubChem Compound Summary for CID 4618, Oxydemeton-methyl* (retrieved October 10, 2022). https://pubchem.ncbi.nlm.nih.gov/compound/Oxydemeton-methyl.
[157] U.S. Environmental Protection Agency, *Oxydemeton-Methyl Facts* (August 2002). https://archive.epa.gov/pesticides/reregistration/web/html/odm_fs.html.
[158] International Programme on Chemical Safety, *Environmental Health Criteria 197, Demeton-S-methyl* (hereafter *IPCS Demeton-S-methyl*) (1997). https://inchem.org/documents/ehc/ehc/ehc197.htm#SubSectionNumber:1.1.2.
[159] *IPCS Demeton-S-methyl.*
[160] Guofeng Jia, *The acute toxicity of Oxydemeton-methly in zebrafish* (March 23, 2017). https://www.biorxiv.org/content/10.1101/119982v1.full.
[161] Devender Kumar Sharma et al., *Assessment of environmental toxicity of oxydemeton methyl by differential pulse polargraphy* (2011). https://aes.asia.edu.tw/Issues/AES2011/SharmaDK2011.pdf.
[162] European Food Safety Authority, *Conclusion regarding the peer review of the pesticide risk assessment of the active substance oxydemeton-methyl*, EFSA Scientific Report (2006) (hereafter *EFSA Conclusion on Oxydemeton-Methyl)*. https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2006.86r.
[163] *Id.*
[164] National Oceanic and Atmospheric Administration, *CAMEO Chemicals Publication on Oxydemeton Methyl*. https://cameochemicals.noaa.gov/chemical/18183.
[165] *Id.*
[166] *EFSA Conclusion on Oxydemeton-Methyl.*
[167] Richard G. Ames et al., *Cholinesterase activity depression among California agricultural pesticide applicators*, American Journal of Industrial Medicine (1989). https://onlinelibrary.wiley.com/doi/abs/10.1002/ajim.4700150203.
[168] *Id*.
[169] *EFSA Conclusion on Oxydemeton-Methyl.*

associated with negative neurodevelopment in 7-year-old children. The study participants included 283 mothers and children living in the agricultural Salinas Valley of California. The study found an observed decrease of 2.2 points in Full-Scale IQ and 2.9 points in Verbal Comprehension.[170]

Additionally, in one case study, thirty-five workers became ill after they entered a cauliflower field contaminated with residues of: OMD, Phosdrin and Lannate. One crew member was pregnant with a 4-week-old fetus.[171] At birth, the infant had multiple cardiac defects, cerebral and cerebellar atrophy, and facial anomalies.[172] Ultimately, the child died at 14 days of age.[173] Of the three chemicals involved, and as described above, the reproductive effects in test organisms have been observed only with OMD.[174]

Paraquat Dichloride

Paraquat is one of the most widely used herbicides with an average of 8.5 million pounds applied annually to 15.8 million acres.[175] It is predominantly used for weed and grass control.[176] According to the EPA, paraquat is so harmful to humans that "one sip can kill." There is no antidote for poisoning from paraquat ingestion.[177]

People may be exposed to paraquat through inhalation, ingestion, or dermal absorption. Acute toxicity of Paraquat might result in kidney failure, confusion, coma, fast heart rate, injury to the heart, liver failure, lung scarring, muscle weakness, pulmonary edema (fluid in the lungs), respiratory (breathing) failure, possibly leading to death, and seizures. Paraquat exposure is also associated with increased risk of Parkinson's Disease.[178] Critically, exposure to a combination of maneb and paraquat increases risk of Parkinson's Disease, "particularly in younger subjects and/or when exposure occurs at younger ages."[179] People who survive paraquat poisoning may live with long-term effects such as scarred lungs, kidney failure, scarring of the esophagus, heart failure and other problems.[180]

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[170] Robert Grunier et al., *Prenatal Residential Proximity to Agricultural Pesticide Use and IQ in 7-Year-Old Children,* Environmental Health Perspectives Volume 125, No. 5 (May 24, 2017). https://ehp.niehs.nih.gov/doi/full/10.1289/EHP504.
[171] Pablo Romero et al., *Congenital anomalies associated with maternal exposure to oxydemeton-methyl*, Environmental Research Volume 50, Issue 2 (December 1989). https://www.sciencedirect.com/science/article/abs/pii/S0013935189800064.
[172] *Id.*
[173] *Id.*
[174] *Id.*
[175] U.S. Environmental Protection Agency, *Paraquat Dichloride: Interim Registration Review Decision Case Number 0262* (July 2021). https://www.regulations.gov/document/EPA-HQ-OPP-2011-0855-0307.
[176] Centers for Disease Control and Prevention, *Facts about Paraquat* (hereafter *CDC Facts about Paraquat*) (last reviewed Apr. 4, 2018). https://emergency.cdc.gov/agent/paraquat/basics/facts.asp.
[177] Terry Turner, *Paraquat*, Consumer Notice (last modified February 3, 2022). https://www.consumernotice.org/environmental/pesticides/paraquat/.
[178] *CDC Facts about Paraquat.*
[179] Beate R. Ritz et al., *Dopamine Transporter Genetic Variants and Pesticides in Parkinson's Disease*, Environmental Health Perspectives 117.6 (2009): 964-969. Web. 19 July 2017. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2702414/.
[180] *CDC Facts about Paraquat.*

A study investigating California community exposure to paraquat drift found that the group exposed to paraquat over a two-week period showed significantly elevated symptoms of cough, diarrhea, eye irritation, headache, nausea, rhinitis, throat irritation, trouble breathing, unusual tiredness, and wheezing. The study went on to recommend that paraquat "not be sprayed near residential communities."[181]

Paraquat is classified as "extremely biologically active and toxic to plants and animals."[182] Paraquat is known to disrupt hormone function in adult frogs and is genotoxic in tadpoles.[183] Additionally, algae are highly sensitive to paraquat.[184] As such, paraquat's alterations to algal composition can significantly disturb freshwater ecosystems, potentially resulting in loss of biodiversity, harmful algal blooms, disease, and decline in fisheries.[185] Terrestrially, the EPA concluded that paraquat is moderately toxic to birds, and it can affect reproduction or hatchability of eggs. Paraquat is toxic to some soil fungi and bacteria.[186]

Because of paraquat's severe health effects and environmental impacts, 58 countries, including China and members of the European Union, have banned the use of paraquat.[187] Yet, despite its serious risks, its use has doubled between 2012 and 2017 in the United States.

Potassium N-Methyldithiocarbamate

Potassium N-Methyldithiocarbamate (i.e., metam potassium) is a fumigant that rapidly degrades in the environment to form "highly volatile" methyl isothiocyanate (MITC), similar to metam sodium.[188] MITC poses acute inhalation risks to pesticide applicators, bystanders, and residents in the community due to offsite drift and volatization, and MITC exposure can also cause eye irritation, allergic reactions from skin exposure, and "more adverse systemic effects."[189]

A 2016 incident in Uganda involving volatized metam sodium led to acute illness in 110 agricultural workers who suffered vomiting, syncope, and acute diarrhea when the soil was not tarped after fumigation and MITC gases became trapped in a greenhouse.[190] Additional common symptoms included dizziness, shortness of breath, eye irritation, and headache.[191]

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[181] Richard G. Ames et al., *Community Exposure to a Paraquat Drift*, Archives of Environmental Health: An International Journal, 48:1, 47-52 (1993).
[182] U.S. Environmental Protection Agency, *Paraquat Dichloride Reregistration Eligibility Decision* at p.72 (Aug. 1997). https://archive.epa.gov/pesticides/reregistration/web/pdf/0262red.pdf.
[183] Meriel Watts, *Paraquat Factsheet* (February 2011). http://wssroc.agron.ntu.edu.tw/note/Paraquat.pdf.
[184] *Id*.
[185] *Id*.
[186] *Id*.
[187] Pesticide Action Network International, *Consolidated List of Banned Pesticides* (updated May 2022). https://pan-international.org/pan-international-consolidated-list-of-banned-pesticides/.
[188] U.S. Environmental Protection Agency, *RED Fact Sheet: Methyldithiocarbamate Salts – Metam Sodium/Potassium and MITC* (July 2008) at 2. https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_G-56_10-Jul-08.pdf.
[189] *Id.* at 3.
[190] Susan Nakubulwa et al., *Acute Metam Sodium Poisoning Caused by Occupational Exposure at a Flower Farm – Uganda, October 2016* (April 2018) at 414. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5898219/pdf/mm6714a2.pdf.
[191] *Id.*

There were close to 400 reports of MITC-related illnesses in injuries in California during the 1990s.[192] Additionally, a single incident involving 19,500 gallons of metam sodium spilled from a derailed tanker into the Sacramento River in 1991 led to 848 spill-related hospital visits, primarily attributed to MITC, with symptoms continuing more than one week past the spill.[193] In another incident, more than 170 residents of Earlimart, California were sickened from MITC pesticide drift in 1999, due to a shift in wind direction and an inversion weather phenomenon.[194]

The state of California has recognized metam potassium as a cancer-causing pesticide since 2010 based on findings of the U.S. Environmental Protection Agency.[195] Research links exposure to MITC to a two-fold increase in the rate of childhood leukemia.[196]

Zinc Phosphide

Zinc phosphide is a rodenticide in the category of "acute toxicants."[197] In particular, it falls into Toxicity Category I (highest category) for acute effects via oral or inhalation exposure, Toxicity Category III for dermal exposure, and Toxicity Category IV for eye irritation.[198] Handlers are at risk of exposure to bait and dust formations.[199] Zinc phosphide reacts with water to form toxic phosphine gas and "[b]reathing in zinc phosphide dust or phosphine gas given off by zinc phosphide may cause anxiousness and extreme difficulty breathing."[200] Likewise, rodenticides pose risks of exposure to children, especially in residential settings, and "a single swallow of zinc phosphide bait may be fatal to a young child."[201] Zinc phosphide is "extremely toxic to birds, fish and other wildlife."[202]

Interactions

Beyond their individual harms, these pesticides also interact with each other—and with the plethora of non-restricted pesticides used all the time in the various settings, including agricultural,

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[192] Department of Pesticide Regulation, *Risk Characterization Document: Methyl Isothiocyanate (MITC) Following the Agricultural Use of Metam Sodium* (July 2003) at 9. https://www.cdpr.ca.gov/docs/risk/rcd/mitc_sb950.pdf.
[193] *Id.* at 11-12.
[194] *Id.* at 14-15.
[195] Office of Environmental Health Hazard Assessment, *Chemical Listed Effective December 31, 2010 as Known to The State of California to Cause Cancer: Metam potassium (CAS 137-41-7)* (Dec. 2010). https://oehha.ca.gov/proposition-65/crnr/chemical-listed-effective-december-31-2010-known-state-california-cause-cancer.
[196] Naveen Joseph et al., *Investigation of Relationships Between the Geospatial Distribution of Cancer Incidence and Estimated Pesticide Use in the U.S. West*, AGU GeoHealth (May 2022) at 11. https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021GH000544.
[197] Department of Pesticide Regulation, *Frequently Asked Questions about rodents and rodenticides* (June 2015) at 3. http://file.lacounty.gov/SDSInter/acwm/235831_FAQRodentsandRodenticides.pdf.
[198] U.S. Environmental Protection Agency, *R.E.D. Facts: Zinc Phosphide* (hereafter *USEPA RED Facts: Zinc Phosphide*) (July 1998) at 2. https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-088601_1-Jul-98.pdf.
[199] *Id.* at 3.
[200] National Pesticide Information Center, *Rodenticides: Topic Fact Sheet*. http://npic.orst.edu/factsheets/rodenticides.pdf.
[201] *USEPA RED Facts: Zinc Phosphide* at 3.
[202] U.S. Environmental Protection Agency, *Letter to Matthew T. Bucy approving amended product label* (Feb. 25, 2022). https://www3.epa.gov/pesticides/chem_search/ppls/OR140016-20220225.pdf.

industrial, and residential—to increase human health risks. Pesticides can interact in three ways: (1) cumulative risk i.e., risk from exposure to multiple pesticides; (2) additive effects i.e., when chemicals target the same tissue or organ; and (3) synergistic effects i.e., when exposures to two or more pesticides creates toxic effects that are greater than the sum of its parts.[203]

Although older epidemiological studies have focused on the adverse health effects of singular pesticide exposure, individuals living near agricultural pesticide applications are in fact exposed to a complex mixture of pesticides.[204] One of the highest cumulative toxicity was from working with organophosphate and carbamate pesticides.[205] So much so that the California Environmental Protection Agency - Office of Environmental Health Hazard Assessment recommends enhanced monitoring of agricultural workers exposed to such pesticides.[206]

As one example of additive effects: organophosphates such as malathion and chlorpyrifos inhibit key enzymes that aid in neurotransmission. Carbamates such as carbaryl target the exact same enzyme. As such, their effects are additive in the human body.[207]

In the case of synergistic effects, as seen from the 2021 and 2022 permits, MITC, 1,3-D, and Chloropicrin are applied in high volumes close to each other. MITC, 1,3-D, and Chloropicrin interact to: decrease the body's ability to detoxify, attack and damage DNA (since all three fumigants are genotoxic), and disable DNA Repair and Expression Enzymes.[208] Additionally, this fumigant mixture represents a multiple-organ carcinogenic risk to exposed populations.[209] Because of this, some agricultural researchers have considered these fumigants to be "incompatible" even though they continue to be used together by growers.[210]

Research also demonstrates synergistic effects between paraquat and malathion. Based on health studies in rats, researchers concluded that the herbicide paraquat and organophosphate pesticide malathion likely have adverse combined effects on sex hormones.[211]

Although it is not realistic to physically test every combination of pesticides found in the environment, scientists note that the pesticide registration process provides an opportunity to

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[203] Antonio F. Hernandez et al., *Toxic effects of pesticide mixtures at a molecular level: their relevance to human health*, 307 Toxicology Volume 307 (May 2013) at 136-45.
[204] Clémentine Dereumeaux et al., *Pesticide exposures for residents living close to agricultural lands: A review*, Environment International 134 (2020).
[205] *Id*; *see also* Office of Environmental Health Hazard Assessment, *Guidelines for Physicians Who Supervise Workers Exposed to Cholinesterase Inhibiting Pesticides, Edition 6.0* (December 2017). https://oehha.ca.gov/media/downloads/pesticides/document-pesticides/physicianguidelines.pdf.
[206] *Id*.
[207] Michael Lydy et al., *Challenges in regulating pesticide mixtures*, Ecology and Society 9(6) (2004) (hereafter *Challenges in regulating pesticide mixtures*). http://www.ecologyandsociety.org/vol9/iss6/art1/.
[208] *Exposure and Interaction.*
[209] *Id*.
[210] *Id*.
[211] Rahmanian Elham et al., *The Effect of Herbicide Paraquat and Organophosphate Pesticide Malathion on Changes of Sex Hormones in Female Rats*, Biomedical and Pharmacology Journal, 8. 993-999 (2015). https://biomedpharmajournal.org/vol8no2/the-effect-of-herbicide-paraquat-and-organophosphate-pesticide-malathion-on-changes-of-sex-hormones-in-female-rats/.

assess and remedy the toxicity resulting from potential chemical interactions: for example the agency might "order reduced application rates, mandatory best management practices, or changes in the pesticide formulation, pesticide registration could then be adjusted to take into account the potential impacts of pertinent mixtures."[212]

The Permit puts these individuals at substantial risk of exposure to restricted materials and their toxic breakdown products, both through airborne drift and through groundwater contamination.

[212] *Challenges in regulating pesticide mixtures.*