



February 5, 2021

OPP Docket No. EPA-HQ-OPP-2008-0850
Environmental Protection Agency Docket Center
(EPA/DC), (28221T)
1200 Pennsylvania Avenue NW
Washington, DC 20460-0001

To Whom It May Concern:

Please accept the following comments from the Northwest Center for Alternatives to Pesticides in response to the Environmental Protection Agency's (EPA) Chlorpyrifos Draft Ecological Risk Assessment for Registration Review dated September 15, 2020. The risk assessment is flawed or underprotective for at least four reasons, which are detailed as follows.

1) Chlorpyrifos Threatens Endangered Salmon and Steelhead

EPA must comply with the Endangered Species Act (ESA) in authorizing the use of a pesticide that may harm listed species for widespread use. EPA has consulted with the National Marine Fisheries Service (NMFS) on the effects of its authorization of uses of chlorpyrifos on listed Pacific salmonids and, in a final Biological Opinion in 2017, NMFS found that EPA's authorization of uses of chlorpyrifos is likely to jeopardize the survival and recovery of all listed salmon and steelhead in Oregon, Washington and California. Orca whales in Washington are also jeopardized by chlorpyrifos.¹ As required by the ESA, NMFS included Reasonable and Prudent Alternatives in the Biological Opinion that would reduce the risk that uses of chlorpyrifos pose to these imperiled species. EPA has not yet implemented any of these measures, or any other measures that would provide equivalent levels of protection, in violation of the ESA's explicit prohibition on agency actions that cause likely jeopardy.

Not only has EPA failed to implement any of the Reasonable and Prudent Alternatives in the Biological Opinion, EPA has failed even to acknowledge the detailed analysis in the Biological Opinion, its jeopardy conclusion, or the Reasonable and Prudent Alternatives in its ecological risk assessment for chlorpyrifos. Instead, EPA dismisses the need to comply with the ESA, citing new information on how chlorpyrifos is actually being used. The EPA wants to substitute "usage data" for the authorized label uses in risk assessment. Authorized label uses are the most appropriate source for exposure estimates and were properly the basis for analysis in the 2017 Biop.

¹ National Marine Fisheries Service. 2017. Biological Opinion on the Environmental Protection Agency's Registration of Pesticides containing Chlorpyrifos, Diazinon, and Malathion. <https://repository.library.noaa.gov/view/noaa/16997>

EPA cannot rationally or legally ignore a Biological Opinion finding likely jeopardy in its ecological risk assessment. EPA must revise its ecological risk assessment for uses of chlorpyrifos to incorporate the significant analysis and findings in the Biological Opinion, and EPA must impose the Reasonable and Prudent Alternatives from that Biological Opinion – or measures that EPA can demonstrate provide an equivalent level of protection.

2) Chlorpyrifos in Our Food Crops Exposes Us All to Substantial Doses of a Neurotoxin

Chlorpyrifos is widely used and applied on a wide variety of crops and is found in our food at dangerous levels. According to EPA's 2016 risk assessment, in an average diet, Americans unknowingly consume high amounts of chlorpyrifos, resulting in exposures many times levels deemed safe. While adult exposures are 62 times higher than the safe level, shockingly, children ages one to two consume chlorpyrifos in food at levels 140 times their "safe" level, according to EPA estimates in 2016.²

The 2020 assessment abandons EPA's prior attempt to find a safe exposure level that would prevent damage to children's brains. EPA instead used a model developed by Dow Agrosiences based on human studies to try to pinpoint the exposures that correspond to 10% cholinesterase inhibition. No additional peer review of scientific evidence was done between 2016 and 2020 to show that that 2016 assessment shouldn't be used. Instead, EPA adopted arguments made by Dow that run counter to EPA policies and the requirements of the law. The message of the 2020 assessment, repeated multiple times, is: "The science addressing neurodevelopmental effects remains unresolved." While the precise exposure level and mechanism by which chlorpyrifos damages children's brains is uncertain, the link between this pesticide and debilitating learning disabilities and brain damage is well-established. Under EPA policy, the agency cannot ignore evidence of harm simply because it has not yet determined the mode of action.

The major metabolite of chlorpyrifos, 3,5,6-Trichloro-2-pyridinol (TCP), is a widespread pollutant that is classified as persistent and mobile by the EPA, with a half-life ranging from 65 to 360 days in soil.³ It is more migratory than its parent molecule due to its greater water solubility, which can cause widespread contamination of soils and aquatic environments.^{4,5,6} A 2005 study on exposures of preschool children to TCP in their everyday environments showed that low levels of both chlorpyrifos and TCP were found in all parts of their environment and median TCP concentrations were 12 and 29 times

² U.S. Environmental Protection Agency. 2016. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. <https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0454>.

³ Armbrust KL. 2001. Chlorothalonil and chlorpyrifos degradation products in golf course leachate. *Pest Manag. Sci.* 57:797-802.

⁴ Racke KD, Coats JR, Titus KR. 1988. Degradation of chlorpyrifos and its hydrolysis product, 3,5,6-trichloro-2-pyridinol, in soil. *J. Environ. Sci. Health B* 23:527-539.

⁵ Racke KD, Robbins ST. 1991. Factors affecting the degradation of 3,5,6-trichloro-2-pyridinol in soil. *ACS Symp. Ser. Am. Chem. Soc.* 459:93-107.

⁶ Feng Y, Racke KD, Bollag JM. 1997. Isolation and characterization of a chlorinated-pyridinol-degrading bacterium. *Appl. Environ. Microbiol.* 63:4096-4098.

higher than those of chlorpyrifos alone in solid food samples.⁷ Another study examined the urine of pregnant women containing TCP in Mexico City and its relationship with child attention deficit and hyperactivity disorder (ADHD). This study found suggestive evidence for increased ADHD in boys and increased attention problems for girls.⁸ The EPA states on page 12 of their 2020 risk assessment that TCP is not of concern. This is contradictory to the findings of the literature and we question the EPA's finding of no concern and believe that further analysis on this topic is warranted in the final risk assessment.

3) Chlorpyrifos is Harmful to Farm Workers and Their Children

While chlorpyrifos was deemed harmful enough to human health that it was delisted years ago for most residential uses, those who grow our food are not protected, absorbing chlorpyrifos through the skin and inhalation as they pick and pack and tend the crops. Workers who re-enter the fields soon after pesticide applications will face risks of concern. For over 30 activities performed by workers, EPA estimates a high level of concern. The length of time required before re-entering the fields after spraying would need to be extended by several more days than is currently required.

For workers applying chlorpyrifos, the risk is even greater. EPA purports to find that personal protective equipment (PPE) and engineering controls will protect many handler activities. But double layers of clothing, long-sleeves, long-pants, and respirators may lead to heat and respiratory stress during much of the growing season in many parts of the country where chlorpyrifos is applied. And even with label-specified PPE, EPA found that over 100 occupational handler scenarios are of concern. As for using engineering controls to mitigate risk, EPA states on page 19 of the 2020 assessment that “even with engineering controls, risks of concern were identified for most uses from mixing and loading for aerial and chemigation applications.”

The risk assessment is also underprotective because it fails to account for the risks workers face from aggregate exposures to chlorpyrifos from their jobs, pesticide drift, residues that remain on their clothes, introduction of chlorpyrifos-laden dust into their homes, and drinking water from both crop and other uses of chlorpyrifos.

The children of farm workers are often directly exposed to pesticides as well – by their proximity to the fields while living in substandard migrant housing, and by unknowingly coming into contact with the pesticide residues on the clothing or shoes of their parents when they return from the fields.

⁷ Morgan, M., Sheldon, L., Croghan, C. et al. Exposures of preschool children to chlorpyrifos and its degradation product 3,5,6-trichloro-2-pyridinol in their everyday environments. *J Expo Sci Environ Epidemiol* 15, 297–309 (2005). <https://doi.org/10.1038/sj.jea.7500406>

⁸ Fortenberry GZ, Meeker JD, Sanchez BN, Barr DB, Panuwet P, Bellinger D, et al. Urinary 3,5,6-trichloro-2-pyridinol (TCPY) in pregnant women from Mexico City: distribution, temporal variability, and relationship with child attention and hyperactivity. *Int J Hyg Environ Health*. 2014;217:405–12.

Babies in utero can also be exposed. Several longitudinal studies spanning two decades have allowed us to glimpse a fact that might seem amazing – when pregnant women are exposed to organophosphate pesticides like chlorpyrifos, their children suffer brain development disorders.⁹ Studies have shown that of the children born to exposed mothers, infants tend to have slower reflexes,¹⁰ toddlers exhibit autism-like disorders,¹¹ and seven-year-olds tested with IQs, on average, seven points behind their peers.¹²

4) Chlorpyrifos is Dangerous for Anyone Near an Application

Chlorpyrifos is so toxic that even a football field away from an application is not far enough to avoid risk. The EPA states in its 2016 risk assessment that, in order to reduce human safety risks from drift and volatilization near an application, buffers greater than 300 feet are needed.¹³ But buffers of these widths are not currently mandated on labels or recommended in the 2020 risk assessment despite farm worker housing, schools, and other farms being commonly located much closer to an application than 300 feet.

Instead, EPA again reverts to using an underprotective endpoint, the model developed by Dow Agrosciences mentioned earlier, and states that drift and occupational hazards are not of concern. On page 19 of the 2020 risk assessment, EPA states that because applicators have lowered application rates, increased droplet sizes, and increased buffer zones there "were no combined (dermal + incidental oral) risks for children 1 to < 2 years old at the field edge from indirect spray drift exposure to chlorpyrifos and there were no dermal risk estimates of concern at the field edge for adults (females 13 - 49 years old)." This statement of no risk for children and adult females is flawed because it doesn't account for neurodevelopmental harm as measured in EPA's 2016 risk assessment.

Additionally, even with the adoption of lower application rates and increased droplet sizes, weather conditions such as wind speed can change abruptly and lead to unplanned extensive drift. For all of these reasons, the finding of no drift concern is egregious and should be re-examined in the EPA's final risk assessment.

⁹ See studies at <https://cerch.berkeley.edu/> for CHAMACOS studies, a longitudinal birth cohort study which investigates pesticide and other environmental exposures on the health and development of children living in agricultural communities in the Salinas Valley, California. Other longitudinal studies have found similar results. See studies conducted by Columbia University at <https://ccceh.org/> and at the Mount Sinai Children's Environmental Health Study (<https://icahn.mssm.edu/about/departments/environmental-public-health/cehc>).

¹⁰ Young, J., B. Eskanazi [and others] 2005. Association between in utero organophosphate pesticide exposure and abnormal reflexes in neonates. *Neurotoxicology* 26(2):199-209. <https://www.ncbi.nlm.nih.gov/pubmed/15713341>

¹¹ Sagiv, S., M. Harris [and others] 2018. Prenatal Organophosphate Pesticide Exposure and Traits Related to Autism Spectrum Disorders in a Population Living in Proximity to Agriculture. *Environ. Health Perspect.* 126(4): 047012. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6071837/>

¹² Bouchard MF, Chevrier J, Harley KG, Kogut K, Vedar M, Calderon N, et al. 2011. Prenatal Exposure to Organophosphate Pesticides and IQ in 7-Year- Old Children. *Env. Health Perspect.* 119:1189-1195. doi:10.1289/ehp.1003185

¹³ U.S. Environmental Protection Agency. 2016. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review. <https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0454>

We Must Prioritize Alternative Solutions

We recognize that it can be difficult for farmers when a pesticide is removed from their arsenal. But, if banned, chlorpyrifos would be far from the only pesticide ever withdrawn from the market due to safety hazards. DDT and many other pesticides once considered indispensable have been cancelled over the years as their safety risks became better understood - and farms have survived.

Many growers already utilize safe, alternative strategies to reduce insect pressure. We host educational events with farmers throughout the Northwest and we have seen these alternatives demonstrated firsthand. As states like California, New York, Hawaii, Maryland, and Oregon restrict or ban chlorpyrifos, they prioritize development and implementation of safer alternatives and methods. California has provided a comprehensive list of alternative products while also noting the concern for the sole action of substituting products as opposed to a holistic and systemic approach for addressing pest management. By adopting a combination of ecological growing techniques, farmers will naturally reduce their reliance on chemical inputs. These methods focus on prevention, rather than a chemical to treat an outbreak.

We urge EPA to ban chlorpyrifos and prioritize alternatives instead of implementing inadequate measures to reduce harm.

Sincerely,



Ashley Chesser
Executive Director
Northwest Center for Alternatives to Pesticides



Sharalyn Peterson
Healthy Wildlife and Water Program Manager
Northwest Center for Alternatives to Pesticides