

To: Oregon Department of Agriculture and Chlorpyrifos Work Group members

From: Lisa Arkin, Beyond Toxics and Martha Sonato, PCUN (Stakeholder Group members)

Re: Comments from Chlorpyrifos Work Group Stakeholder Scope

Date: 1/21/2020

Acknowledging the tight timeline established for the efforts of the Chlorpyrifos Work Group, we submit these interim comments regarding its scope and goals.

Human Health as a Criterion for Rule Making

Chlorpyrifos is a chlorinated organophosphate insecticide which in higher doses can cause acute, neurotoxic poisoning. Due to the documented hazardous characteristics of chlorpyrifos, the U.S. Environmental Protection Agency (EPA) took action to reduce residential exposures. For nearly two decades, the EPA has documented adverse effects of chlorpyrifos on the physical and mental development of infants and children.¹ In 2000, the registrants and EPA agreed to phase out almost all residential uses. In November 2016, the US EPA revised their human health risk assessment which included setting tolerances on the maximum residue of a pesticide that can be in or on food.² The Agency's revised analysis shows risks from residues of chlorpyrifos on food crops and drinking water. The Agency concluded that chlorpyrifos residues on foods present especially high risks for children, finding that exposures from food exceed the EPA's safety threshold by 140 times.³ Due to the inability to make a safety finding, the EPA proposed revoking all chlorpyrifos tolerances for food and water residues.⁴ Following action by one EPA director in 2017, the plan to revoke chlorpyrifos tolerances for food and water residues was reversed. The case has now been taken up in the legal system.

On August 7, 2019, the states of New York, California, Washington, Maryland, Vermont and Massachusetts petitioned for review of the EPA's July 2019 order permitting the continued use of chlorpyrifos.⁵ On September 6, 2019, Oregon Attorney General Ellen Rosenblum petitioned to intervene in the suit to join the coalition of states seeking to prevent continued use of chlorpyrifos.⁶ A.G. Rosenblum's petition states Oregon's interest in discontinuing the use of chlorpyrifos as follows:

"Approximately five million pounds of chlorpyrifos are applied to food crops annually in the United States. It is used on a wide variety of foods that are eaten by Oregon's residents, including infants and children who are especially susceptible to its adverse health effects. Oregon's residents consume fruits and vegetables grown throughout the

¹ *League of United Latin Am. Citizens v. Wheeler*, 899 F.3d 814 (9th Cir. 2018).

² See, U.S. Environmental Protection Agency, Chlorpyrifos; Tolerance Revocations; Notice of Data Availability and Request for Comment, 81 Federal Register No. 81, November 17, 2016.

³ See, *Id.*

⁴ See <https://archive.epa.gov/epa/pesticides/epa-proposes-revoke-chlorpyrifos-food-residue-tolerances.html>

⁵ *New York et al. v. Wheeler*, Petition for Review, Case No. 19-71982 (9th Circuit Court of Appeals, August 7, 2019).

⁶ *Oregon Sues EPA Over Toxic Pesticide in Food*, Oregon Department of Justice Media, September 6, 2019 (available at: <https://www.doj.state.or.us/media-home/news-media-releases/oregon-sues-epa-over-toxic-pesticide-in-food/>).

United States that contain chlorpyrifos residues at levels for which EPA has not issued a current finding of safety.”⁷

Furthermore, the Attorney General’s office highlighted its basis of concern for adverse health impacts, stating:

“Oregon has an interest in ensuring that its residents are afforded the protection of federal pesticide safety standards and that the burden of health care and other costs on petitioners does not increase due to the adverse health effects of continued exposure to chlorpyrifos residues at levels for which EPA has not made a current finding of safety.”⁸

The Oregon Attorney General reasoned that intervening in the federal case would “afford Oregon a voice on the continued use of chlorpyrifos, an issue of national significance to be sure but which specifically affects the daily lives of millions of Oregon residents.”⁹

The shift to a legal challenge does not negate the significant body of evidence from both longitudinal cohort studies and animal studies demonstrating that children are vulnerable to long-lasting, adverse cognitive and behavioral outcomes when exposed during pregnancy to chlorpyrifos. In other words, the science indicates that chlorpyrifos may cause significant neurodevelopmental harms in children at lower doses and through different mechanisms than previously understood. For example, the EPA stated in its 2016 Revised Human Health Risk Assessment that children with higher chlorpyrifos exposure—where the most significant adverse neurodevelopmental effects were observed—likely had chlorpyrifos blood levels below those which would trigger EPA’s safety threshold (10% AChE inhibition).

The harmful effects of chlorpyrifos exposure to children are well documented and include health problems in children such as reduced IQ, loss of working memory and attention deficit disorder.¹⁰ Furthermore, experiments in rats demonstrated links between chlorpyrifos exposure and neurodevelopmental toxicity.¹¹ Three epidemiological studies regarding chlorpyrifos exposure in humans further found that children of mothers exposed to chlorpyrifos were more likely to develop neurodevelopmental disorders such as attention deficit hyperactivity disorder and autism spectrum

⁷ See, Motion for Leave to Intervene and Join with the State Petitioners by the State of Oregon, Pg. 3, *League of United Latin American Citizens v. Wheeler*, Case No. 19-71982 (9th Cir. 2019).

⁸ See, *Id* at 3.

⁹ See, *Id* at 4.

¹⁰ See, Raugh, V., Arunajadai, S. Horton, M. Perera, F., Hoepner, L., Barr, D.B., & Whyatt, R., *Seven-year Neurodevelopmental Scores and Prenatal Exposure to Chlorpyrifos, A Common Agricultural Pesticide*, *Environmental Health Perspectives*, 119(8), 1196 (2011); see also, Furlong, M.A., Engel, S.M., Barr, D.B., & Wolff, M.S., *Prenatal Exposure to Organophosphate Pesticides and Reciprocal Social Behavior in Childhood*, *Environment International*, 70, 125-131 (2014); see also, Khan, K., Ismail, A.A., Rasoul, G.A., Bonner, M.R., Lasarev, M.R., Hendy, O.,...& Rohlman, D.S., *Longitudinal Assessment of Chlorpyrifos Exposure and Self-Reported Neurological Symptoms in Adolescent Pesticide Applicators*, *BMJ open*, March 4, 2014 (available at: <http://bmjopen.bmj.com/content/4/3/e004177.short>); see also, Qiao, D., Seidler, F.J., Tate, C.A., Cousins, M.M. & Slotkin, T.A., *Fetal Chlorpyrifos Exposure: Adverse effects on Brain Cell Development and Cholinergic Biomarkers Emerge Postnatally and Continue Into Adolescence and Adulthood*, *Environmental Health Perspectives*, 111(4), 5e36-544.

¹¹ See, S.M. Chanda & C.N. Pope, *Neurochemical and Neurobehavioral Effects of Repeated Gestational Exposure to Chlorpyrifos in Maternal and Developing Rats*, 53 *Pharmacology Biochemistry & Behavior* 771 (1996); see also, Edward Levin et al., *Persistent Behavioral Consequences of Neonatal Chlorpyrifos Exposure in Rats*, 130 *Brain Dev. Res.* 83 (2001).

disorder.¹² In assessing these three studies in humans, the American Academy of Pediatrics said the following:

“In all three studies, researchers began by screening and collecting demographic, environmental, and medical data from pregnant mothers. For the past twenty years, they have followed the health and development of the children to assess the impact of certain factors, including exposure to toxic chemicals. Studies like these, that follow groups of people who differ with respect to certain factors and then track how these factors influence the rates at which particular outcomes occur, are known as prospective cohort studies, and are considered the “gold standard” in epidemiology.”¹³

The American Academy of Pediatrics further found that *“these studies suggested that prenatal chlorpyrifos exposure directly correlates with long-term adverse neurodevelopmental impacts.”¹⁴* In addition, new peer-reviewed research is finding that chlorpyrifos exposure may be linked to cancer in adults, including family members of pesticide applicators.¹⁵

Farmworkers in Oregon are exposed to chlorpyrifos when mixing and applying pesticides containing chlorpyrifos, when working near areas where chlorpyrifos is sprayed or when working in farm fields that contain chlorpyrifos residue from previous applications. Farmworker families are exposed to chlorpyrifos through pesticide drift from spraying applications, from residues on work clothing, through contact with the hair and skin of farmworker family members, and from water contaminated by chlorpyrifos.¹⁶ Even when using protective gear, farmworkers are exposed to unsafe levels of chlorpyrifos creating health risks for farmworkers and their families.¹⁷

The Oregon Legislative Assembly has determined that “the citizens of this state benefit from a system of safe, effective and scientifically sound pesticide regulation.”¹⁸ Taking into account the history of the EPA’s assessment of the health risks of chlorpyrifos, significant body of peer reviewed scientific studies concerning the health risks, particularly for children exposed in utero, as well as the official stance of the Office of the Oregon Attorney General, we believe it is necessary for the Chlorpyrifos Work Group to consider human health outcomes within its stated purpose of working to reduce human exposures to chlorpyrifos. Contrary to statements made at the December 17, 2019 Work Group meeting, human

¹² See, Virginia Rauh et al., *Impact of Prenatal Chlorpyrifos Exposure on Neurodevelopment in the First 3 Years of Life*, 118 *Pediatrics* 1845 (2006); see also, Stephanie Engel et al., *Prenatal Exposure to Organophosphates, Paraoxonase 1, and Cognitive Development in Childhood*, 118 *Envtl. Health Persp.* 1182 (2011); see also, Lauren Stein et al., *Early Childhood Adversity Potentiates the Adverse Association Between Prenatal Organophosphate Pesticide Exposure and Childhood IQ: The CHAMACOS Report*, 56 *NeuroToxicology* 180 (2016).

¹³ See, Brief for the American Academy of Pediatrics as Amici Curiae, P. 18, *League of United Latin American Citizens v. Wheeler*, Case No. 19-71979 (9th Cir. 2019).

¹⁴ *Id* at 21.

¹⁵ See, C. Ventura et al., *Effects of the pesticide chlorpyrifos on breast cancer disease. Implication of epigenetic mechanisms*, *Journal of Steroid Biochemistry and Molecular Biology* 186 (2019) 96--104; See also Catherin C. Lerro et al., *Organophosphate insecticide use and cancer incidence among spouses of pesticide applicators in the Agricultural Health Study*, *Occupational and Environmental Medicine*, 2015;72:736–744.

¹⁶ Raymer JH, Studabaker WB, Gardner M, Talton J, Quandt SA, Chen H, Michael LC, McCombs M, Arcury TA, *Pesticide Exposures to Migrant Farmworkers in Eastern NC: detection of metabolites in farmworker urine associated with housing violations and camp characteristics*, *AM. J. Ind. Med.*, 57(3), 323-337, March 2014.

¹⁷ U.S. Environmental Protection Agency, *Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review*, 36-37, November 3, 2016.

¹⁸ See, ORS 634.055.

health considerations have their basis in scientific data and analysis, not political arguments. **To meet the Legislature’s stated intent as to pesticide regulation in this state, it is imperative that the Chlorpyrifos Work Group consider human health outcomes.**

Requirements to Protect Human Health: a minimum, not a ceiling

Chlorpyrifos labels and the allowed uses have been amended many times. Some label restrictions are clearly aimed at protecting human health, for example, the ban on residential uses, and increases in buffer zones and restricted entry intervals. We urge that label restrictions to protect human health be standardized for all chlorpyrifos applications and an approach to immediately protect workers and bystanders be adopted in temporary rulemaking.

For example, the label restrictions for Vulcan (EPA Reg. No. 66222-233), a 1B organophosphate whose ai is chlorpyrifos requires a Restricted Entry Interval as follows:

- 4 days for fruit trees
- 5 days for citrus
- 3 days for cauliflower
- 24 hours for all other crops not listed above

Vulcan label also requires a no-spray buffer zone Of 25 ft (ground boom); 50 ft. (air blast) and 150 ft (aerial) from most surface water sites.

Lorsban Advanced is another 1B organophosphate whose ai is chlorpyrifos (EPA Reg. No 62719-591). This product requires buffer zones for the following “sensitive sites,” defined to include (among a number of sites): pedestrian sidewalks, buildings occupied by humans for residential and commercial purposes, farm worker housing, outdoor recreational sites, schools, residential areas, nursing homes, day cares and hospitals. Buffers vary between 10 and 100 ft., even when coarse droplets are applied.

Oregon is required to observe mandated court-ordered interim no-spray buffer zones for chlorpyrifos around waterways to protect endangered or threatened Pacific salmon and steelhead in Oregon.¹⁹ The mandatory no-spray buffer zones for specific salmon or steelhead-bearing streams are 60 feet for ground applications, and 300 feet for aerial applications. As stakeholders representing impacted farm workers, children and nearby rural residents, we support a recommendation that the Agency require no-spray buffer zones for humans that are at least as protective as those that are mandated to protect native fish.

Our strong recommendation is that, in order to provide the what reasonable people would consider the basic minimum of protections for human health, the **Agency immediately adopt temporary rules to require a minimum 5-day restricted re-entry interval for all uses of chlorpyrifos, and a minimum 300 ft. no-spray buffer separating all applications of chlorpyrifos and sensitive sites as defined in the label** for Lorsban Advanced. A temporary rule is necessary to protect humans now as the stakeholder group continues its study and deliberations regarding recommendations for chlorpyrifos regulations.

¹⁹ <https://www.oregon.gov/ODA/programs/Pesticides/Water/Pages/Buffers.aspx> (accessed 1/18/2020).

Restricted Use Pesticide

In Oregon 35 out of 46 registered chlorpyrifos products are labeled RUP. However, some products are not labeled RUP if they are sold in large quantity packaging. Products are labeled RUP based on their hazardous characteristics, not based on an unfounded assumption that some users will be discouraged from buying pesticides in bulk quantities. The fact that the DEQ has detected Lorsban in urban areas exceeding USEPA Aquatic Life Benchmarks is likely an indicator that some non-licensed users are purchasing and applying these OP's. All products with the ai chlorpyrifos must be restricted because chlorpyrifos can harm both the applicator and nearby bystanders by causing neurological damage from inhalation exposure through drift. Users and bystanders may experience inhibited plasma cholinesterase levels activity when chlorpyrifos particles are inhaled.²⁰ We also concerned that exposure impacts may extend to family members who are not directly in contact with the pesticide.²¹

We recommend the Chlorpyrifos Work Group and agency staff immediately amend all labels for chlorpyrifos products registered in Oregon as RUP.

Chlorpyrifos Exposure Cases in Oregon

ODA or PARC closed investigations pertaining to chlorpyrifos may be an incomplete or misleading indication of chlorpyrifos exposure in Oregon for many reasons, among them:

- Farm workers are unlikely to report symptoms of pesticide poisoning due to fear of losing their jobs, fear of retaliation on the job, uncertainty or lack of knowledge about pesticide poisoning symptoms, lack of access to health care and the inability to have access to information on what products they are using on the job;
- ODA and PARC have open cases of possible chlorpyrifos drift and human exposure that were not included in the 12/17 stakeholder meeting materials;
- Some of the reported cases do not result in a resolution including a Letter of Advisement or a Notice of Violations for many reasons. Some reasons include the inability of the investigator to determine the source of the documented chlorpyrifos drift, cases that are dropped by the complainant and/or lack of cooperation from pesticide applicators of farmers.

In conclusion, the Oregon Department of Agriculture has the responsibility to not ignore the dangers that chlorpyrifos exposure presents to humans. The Agency's Chlorpyrifos Stakeholder group, the State Legislature and the Oregon Attorney General are all focused on chlorpyrifos to reduce and eliminate the high risk to human health, particularly children's neurodevelopment and farm worker health. The states of Hawaii, California and New York have already taken decisive steps. We recommend that in order to

²⁰ Occupational Health Services, Inc. 1986. *Material safety data sheet on chlorpyrifos*. Secaucus, N.J: OHS, Inc.; See also American Conference of Governmental Industrial Hygienists, Inc. 1986. *Documentation of the threshold limit values and biological exposure indices*. Fifth edition. Cincinnati, OH: Publications Office, ACGIH.

²¹ *Id* at 14.

safeguard workers and surrounding, the Agency, using their authority to adopt temporary rulemaking require that applicators:

- Provide notice of the application to the nearby residents, schools and pesticide applicators' families at least forty-eight hours in advance of the application that includes: Include targeted outreach in appropriate languages with culturally appropriate materials;
- If using a product containing an ai of chlorpyrifos, require the applicator to submit pesticide spray records to the Department of Agriculture within 48 hours of the spray operation.

We strongly urge the Oregon Department of Agriculture to act swiftly to include human health criteria in the scope of the Chlorpyrifos Stakeholder Work Group and to restrict the use of chlorpyrifos in Oregon to protect human health, first through temporary rulemaking and subsequent permanent rulemaking in 2020.