February 12, 2020
Lorne K Garrettson, MD, FAAP, ACMT

Re: HB 229– Pesticides –Use of Chlorpyrifos - Prohibition
Submitted to: The House Environment and Transportation Committee
Position: In support of HB 229

Chairman Pinsky and members of the committee,

I am Lorne Garrettson, a retired pediatrician with sub-boards in Medical Toxicology and am emeritus professor of Pediatrics at Emory University and a member of the Maryland Chapter of the American Academy of Pediatrics. Today I am representing the Maryland Pesticide Education Network of which I am a board member and the Smart on Pesticides Coalition of 105 member organizations and businesses that the Maryland Pesticide Education Network facilitates.

Chlorpyrifos has been shown to be harmful to the brain and intellectual development of children. The Columbia group found that domestic use, documented by blood sampling of mothers and newborns, was associated with loss of IQ and the presence of behavioral disorders including attention disorder, hyperactive disorder or ADHD and autism spectrum disorders or ASD. There have been corroborative studies. This is now settled science in the eyes of the pediatric community. The group at the University of California, studying agricultural use of chlorpyrifos and the infants born in the vicinity of this use, have found an increase in ADHD and ASD among the children and it is related to the proximity that their mothers were to the spraying during gestation.

Behavioral disorders are on the increase in the USA and, particularly to our concern, here in Maryland. The CDC tracks the incidence of ASD and has documented a dramatic increase in incidence which is now found in 2% of the children in large regional studies in our State. While the cause of ASD is multifactorial, it is becoming clearer all the time that toxins play a role in causation and chlorpyrifos is one of those toxins.

I would like to put this in perspective. Other useful and effective products have necessitated society to stop their use because of side effects.

Dutch Boy Paint used to advertise their product as 'good for children.' They could not have known that a child sucking on a painted window sill would lead to lead poisoning and brain deterioration. When we learned this, we removed lead from paint. The safer paint is highly durable, but that took study and work.

When I entered the pediatric field, we had a wonderful antibiotic, chloramphenicol, sold under the trade name of Chloromycetin. It was effective in the case of many serious infections and distributed to parts of the body not accessed by other antibiotics. But, with widespread use, we learned that some patients developed aplastic anemia. This is a lethal disease, treated by bone marrow transplantation in some

cases. This was never a common side effect, but a devastating one. We don't use chloramphenicol any more.

This is both a moral and economic issue. We don't knowingly injury our young. When we find out that we are doing so inadvertently, we stop. We must have the same approach to effective environmental toxins. Serious side effects must end their use.

Others may talk better than I about the economic costs of the developmental problems we are discussing here. But, the costs to our society of behavioral disability and cognitive deficits are staggeringly large. Short term local economic benefits don't hold a candle to the long range deficits to our society from cognitive loss. The diseases or conditions caused by chlorpyrifos are ones that limit a child's potential for success in school, society and the workplace. The economic loss to society from diminishing the potential of children is awesome to consider. We must take into account that according to the CDC[6] , the percent of children with an ADHD diagnosis continued to increase, from 7.8% in 2003 to 11.0% in 2011-12. In 2011, 8.8% of US children and 8.9% of children in Maryland had current ADHD. Children with ADHD are also likely to have emotional and behavioral problems and may face many challenges including difficulty with their emotions, learning and behavior. This increases a family's need for medical and mental health service s and increase economic burden. The annual financial and societal costs of ADHD on the juvenile and criminal justice systems are approximately $42.5 billion. A recent CDC finding is that 2% of eight year old children in Baltimore County had autism. This is nearly a doubling in the past 6 years. While multifactorial in cause, toxic exposure is one of the causes of autism and chlorpyrifos has been identified as a contributor. We must not be guilty of perpetrating this loss on the future of our country.

I, my three aforementioned colleagues and my fellow Md Pesticide Education Network board members, urge you to pass HB 229 for the sake of our children. It's time we act.

CHLORPYRIFOS HARMS Children, Waterways & Wildlife

#BanChlorpyrifos

> *"EPA has no basis to allow continued use of chlorpyrifos, and its insistence in doing so puts all children at risk."*[1]
>
> —AMERICAN ACADEMY OF PEDIATRICS

Its time to ban Chlorpyrifos, pass HB 229 / SB 300

Chlorpyrifos is a toxic, nerve agent pesticide that has been found to damage children's brain development, contaminate waterways and injure wildlife.

After years of study, the U.S. Environmental Protection Agency concluded that **all uses of chlorpyrifos result in unsafe levels of exposure** and was set to ban it. **Unfortunately, the Trump Administration reversed that decision, putting Marylanders' health and our environment at great risk.**

MARYLAND MUST PROTECT MARYLAND—OUR CHILDREN'S HEALTH CANNOT WAIT.

It's time to BAN CHLORPYRIFOS!

HARM TO CHILDREN

Children have a high risk of exposure in utero or during critical periods of growth.

Chlorpyrifos is linked to **autism, ADHD** and **other neurodevelopmental issues.**[2]

Exposure is associated with adverse birth and developmental outcomes, including preterm birth, low birth weight, congenital abnormalities, pediatric cancers, neurobehavioral and cognitive deficits, asthma and permanent neurological damage.[3]

Children ages 1–2 can be exposed to levels that are

140 TIMES WHAT EPA HAD PREVIOUSLY DEEMED "SAFE."[4]

Widely applied in the production of fruits, vegetables, nuts and other conventionally grown crops, including many kid favorites like apples, peaches, grapes and strawberries.[5]

HARM TO FARM WORKERS AND FARM COMMUNITIES

Pesticide drift continues at toxic levels

300

FEET FROM THE FIELD'S EDGE.[6]

All workers who mix and apply chlorpyrifos are exposed to elevated levels **even with maximum personal protective equipment and engineering controls.**[7]

Just a month after EPA reversed the decision to ban chlorpyrifos, **it poisoned a dozen farm workers in California.**[8] Chlorpyrifos is found at unsafe levels in the air at schools, homes and communities in agricultural areas.[9]

HARM TO BAY AND AQUATIC LIFE

A Chesapeake Bay Program report found that chlorpyrifos ranks among the

TOP 5

INDIVIDUAL TOXINS OF CONCERN.[10]

Atlantic sturgeon, which are listed as **endangered**, are also at high risk of harm from exposure to chlorpyrifos.[11]

Chlorpyrifos toxicology studies suggest behavioral, reproductive and endocrine **disruption to all aquatic arthropods**, such as crabs, especially those in close proximity to chlorpyrifos runoff.[12]

HARM TO BEES AND OTHER POLLINATORS

Second only to neonicotinoids as the **most harmful pesticide to bees.**[13]

Causes **colony threatening brain damage to honeybees,** even at sub-lethal concentrations.[14]

SOURCES

1 American Academy of Pediatrics: https://cdn2.ewg.org/sites/default/files/testimony/AAP%20EWG%20Chlorpyrifos%20Letter.pdf?_ga=2.149776118.1360151206.1544124802-2112824852.1543353251

2 Environmental Protection Agency. Chlorpyrifos Revised Human Health Risk Assessment (2016): https://www.regulations.gov/document?D=E-PA-HQ-OPP-2015-0653-0454

3 Fernando Stein, President, American Academy of Pediatrics: https://www.nytimes.com/2017/11/01/opinion/pesticide-epa.html?_r=0

4 Environmental Protection Agency. Chlorpyrifos Revised Human Health Risk Assessment (2016): https://www.regulations.gov/document?D=E-PA-HQ-OPP-2015-0653-0454

5 American Bird Conservancy: https://abcbirds.org/dangerous-chemical-ban/

6 United Farm Workers: https://ufw.org/epa-refuses-ban-pesticide-linked-poisonings-damage-childrens-brains/

7 Natural Resources Defense Council: https://www.nrdc.org/sites/default/files/epa-proposal-on-clorpyrifos-tolerence-comments-20170117.pdf

8 "Trump's EPA Greenlights a Nasty Chemical. A Month Later, It Poisons a Bunch of Farmworkers." Tom Philpott, Mother Jones: https://www.motherjones.com/environment/2017/05/california-farm-workers-just-got-poisoned-nasty-pesticide-greenlghted-trump/

9 Environmental Protection Agency: https://www.epa.gov/pesticides/updated-human-health-risk-analyses-chlorpyrifos

10 Chesapeake Bay Program. https://www.chesapeakebay.net/documents/Prioritized_Chesapeake_Bay_Organic_Toxics_of_Concern_Method_and_Assessment_2006.pdf

11 National Marine Fisheries Service: https://repository.library.noaa.gov/view/noaa/16997

12 Edward Odenkirchen, The American University, and Ronald Eisler, U.S. Fish and Wildlife Service: https://www.pwrc.usgs.gov/eisler/CHR_13_Chlorpyrifos.pdf

13 Pesticide Residues and Bees – A Risk Assessment", Sanchez-Bayo and Goka, PLOS ONE, 2014: https://doi.org/10.1371/journal.pone.0094482

14 Measurements of Chlorpyrifos Levels in Forager Bees and Comparison with Levels that Disrupt Honey Bee Odor-Mediated Learning Under Laboratory Conditions", Journal of Chemical Ecology, 2016. See https://phys.org/news/2016-03-bees-dumb-ingesting-tiny-doses.html

SMART on PESTICIDES maryland

For Safe Water & Healthy Kids

The Smart on Pesticides Maryland coalition, spearheaded by the Maryland Pesticide Education Network, works to protect Marylanders and the natural systems we depend upon from the toxic impacts of pesticides. The coalition includes more than 100 organizations, and institutions representing communities, businesses, health care providers, farmers, environmentalists, waterkeepers, interfaith congregants as well as environmental justice, public health and wildlife advocates.

SIGN UP TO RECEIVE LEGISLATIVE UPDATES AT SmartOnPesticides.org

It's Time to
BAN CHLORPYRIFOS
in Maryland (HB 229/SB 300)

THIS BAN WOULD PROHIBIT THE USE OF CHLORPYRIFOS

It would also ban other insecticides containing chlorpyrifos in the state. Numerous alternatives exist: farmers, golf courses and land care professionals are not prohibited from using other pesticides and insecticides.

Maryland must protect Maryland—our children's health cannot wait.

IT'S TIME TO BAN CHLORPYRIFOS.

VOTE YES HB 229/SB 300

Chlorpyrifos (chlor·pyr·i·fos) is a toxic, nerve agent pesticide that has been found to damage children's brain development, contaminate waterways and injure wildlife.

Chlorpyrifos is found in the air and water—and in people's bodies. It is widely used in the production of fruits, vegetables, nuts and other conventionally grown crops, including many kid favorites like apples, peaches, grapes and strawberries. Human exposure takes place when people consume contaminated food and drinking water, touch treated surfaces or breathe the air near treated fields. This volatile chemical can also be brought home from golf courses and farm fields through residues on clothing.

After extensive study, **EPA scientists confirmed that all uses of chlorpyrifos result in unsafe levels of exposure and recommended that the pesticide be banned**. The agency cited the high risk of children's exposure in utero or during critical periods of growth and to the link between chlorpyrifos exposure and autism, childhood cancers, ADHD and other neurodevelopmental issues.

Unfortunately, the Trump Administration overrode the recommendations of EPA's own scientists to ban the use of chlorpyrifos. **There was no scientific basis for this decision—it was a blatant political move to satisfy the chemical industry.** See detailed timeline on reverse.

Banning chlorpyrifos in Maryland would protect our residents—particularly babies, children, pregnant women and farmworkers. It would also protect the Chesapeake Bay and wildlife. Taking action at the state level would save us from having to wait for the EPA, while they continue to delay and battle the issue in court. Many safe and effective alternatives exist for all Maryland pests, including the spotted lanternfly.

Chlorpyrifos is linked to:

- Preterm birth
- Low birth weight
- Congenital abnormalities
- Pediatric cancers
- Neurobehavioral and cognitive deficits
- Asthma
- Permanent neurological damage
- Toxic effects to the Chesapeake Bay, aquatic life, bees and other pollinators and 97% of all federally endangered or threatened species, including over 100 bird species.

TIMELINE OF ACTION ON CHLORPYRIFOS

2000

Dow Chemical and other manufacturers stop home uses of chlorpyrifos due to children's risk.

DECEMBER 2014

EPA's *Revised Human Health Risk Assessment for Chlorpyrifos* acknowledges extensive body of peer-reviewed science correlating chlorpyrifos exposure with brain damage in children, even at low exposure.

NOVEMBER 2015

EPA proposes to ban chlorpyrifos for agricultural uses.

NOVEMBER 2016

EPA releases second revised human health risk assessment with additional scientific data and reaffirms that chlorpyrifos should be banned for agricultural uses.

MARCH 29 2017

In a reversal, the new EPA Administrator Scott Pruitt announces the agency will not finalize the chlorpyrifos ban.

AUGUST 9 2018

The 9th Circuit Court of Appeals rules against EPA's decision to overturn the proposed chlorpyrifos ban and directs the agency to cancel all registrations for chlorpyrifos within 60 days.

SEPTEMBER 24 2018

Trump Administration files appeal of the Court's decision.

APRIL 19 2019

After a rehearing, the 9th Circuit Court of Appeals resolves the EPA has 90 days to decide whether to allow the usage of chlorpyrifos.

JULY 18 2019

The EPA announces it will not ban chlorpyrifos.

AUGUST 7 2019

Maryland joins six other states in suing the EPA and its administrator for not banning chlorpyrifos. Since then, more states have continued to join the suit.

SMART on PESTICIDES maryland
For Safe Water & Healthy Kids

The Smart on Pesticides Maryland coalition, spearheaded by the Maryland Pesticide Education Network, works to protect Marylanders and the natural systems we depend upon from the toxic impacts of pesticides. The coalition includes more than 100 organizations, and institutions representing communities, businesses, health care providers, farmers, environmentalists, waterkeepers, interfaith congregants as well as environmental justice, public health and wildlife advocates.

SMARTONPESTICIDES.ORG

SMART on PESTICIDES maryland

Website: www.smartonpesticides.org
Facebook: http://on.fb.me/Ut6rrX
Twitter: @PesticidesSmart #pesticidedata

February 12, 2020

Re: HB 229– Pesticides –Use of Chlorpyrifos - Prohibition
Submitted to: The House Environment and Transportation Committee
Position: In support of HB 229
Submitted by: Ruth Berlin, Executive Director of the Maryland Pesticide Education Network on behalf of the Smart on Pesticides Coalition. mpnberlin@gmail.com; 410.849.3909 ext. 1

Chairman Barve and members of the committee,

The Smart on Pesticides Maryland (MD) coalition, facilitated by the Maryland Pesticide Education Network, works to protect Marylanders and the natural systems we depend upon from the adverse impacts of pesticides. The coalition includes 104 organizations and institutions (*attached*) representing health care associations, communities, businesses, health care providers, farmers, environmentalists, waterkeepers, interfaith congregants as well as environmental justice, public health and wildlife advocates.

> ***"This chemical [chlorpyrifos] is unambiguously dangerous and should be banned from use. We urge the E.P.A. to reverse its decision and protect child health."***
> *– Fernando Stein, M.D., President of the American Academy of Pediatrics, NYT 11/1/2017*

Prior to the current federal administration, the US EPA was poised to implement a national ban on chlorpyrifos. EPA scientists had determined, after a 20-year risk assessment process, that harm to pregnant women and young children from chlorpyrifos – *at any detectable level of exposure* was an unacceptable risk. However, the US EPA refused to enact the ban. This led Maryland and other states, to sue in federal court. Eventually the full 9th Circuit Court of Appeals upheld its previous 3-judge panel ruling that EPA must issue a final ruling on whether to ban chlorpyrifos, stating in August 2018 that there was *"no justification for the EPA's decision… in the face of scientific evidence that its residue on food causes neurodevelopmental damage to children*. On July 18, 2019, the EPA responded, stating it will not ban chlorpyrifos. Several states, including Maryland, are suing the EPA on the agency's continued reversal. US EPA under the current administration, will likely continue its efforts to stall the process and will likely appeal to the Supreme Court potentially tying up the case for years to come.

Chlorpyrifos is a toxic, nerve agent pesticide also known to harm the environment and wildlife. It is found in air and water—and people's bodies. People come in contact with the chemical through residues on food, drinking water contamination and toxic drift from pesticide application. Negative effects include lower birth weight, developmental disorders including learning disabilities, attention and memory deficits, motor delays and behavioral issues. In addition, poorer perceptual reasoning, working memory, and intellectual development have been documented.

Farmworkers and rural communities are also disproportionately affected by chlorpyrifos from use in the fields as well as toxic drift from application sites. Exposure of field workers can result in tremors, nausea, dizziness and,

in extreme cases, death. Prenatal exposure from living in close proximity to agriculture fields is associated with autism spectrum disorders (Shelton et al., 2014[1];). Recent research on children living near treated farms found memory impairment, oppositional disorders, ADHD decreased ability to discriminate colors, and an increased prevalence of cognitive problems in the parents (van Wendel de Joode et al 2016[2]).

Maryland's children are at continued risk. Given the failure on the federal level to protect our children and farmworkers, Maryland must act to protect Maryland's children, pregnant women, farmers and farmworkers now. Any continued use of chlorpyrifos in our state will allow for life-long adverse health impacts for our children.

Autism Spectrum Disorders Statistics of Note:. In 2019 the CDC reported that current median national autism rates are **1 out of every 40 children**[3] If that isn't already alarming enough, Maryland has been noted as having the second highest rate in the country[4]

In a Centers for Disease Control and Prevention study, published in 2018, scientists found that, 6.1 million children aged 2-17 years living in the U.S. had been diagnosed with attention-deficit/hyperactivity disorder (ADHD)[5]

WHY THE US EPA PLANNED TO BAN ALL USES OF CHLORPYRIFOS

It should be noted that health risks of chlorpyrifos have been raised by US EPA for past two decades

2000: In response to US EPA research-based concerns *20 years ago*, regarding the adverse impacts of chlorpyrifos, in the year 2000, Dow and other manufacturers of chlorpyrifos reached an agreement with the EPA to voluntarily restrict the use of chlorpyrifos in places where children may be exposed, including inside homes, schools and day care centers. At that time, the agency also banned its use on some crops, such as tomatoes, and limited its use on other crops, including apples, grapes and citrus. The EPA also banned its use in certain areas near residential and public spaces.

2015: - In November of 2015, after continued and extensive study, U.S. EPA scientists confirmed that there is no detectable level of chlorpyrifos for dietary exposure that can be considered safe and recommended that the pesticide be banned for all uses. At that time the agency determined that all food uses of chlorpyrifos should be stopped due to the high risk of children's exposure *in utero* or during critical periods of growth and to the link between chlorpyrifos exposure and autism, ADHD and other neurodevelopmental issues. [6]

EPA'S 2015 SCIENTIFIC FINDINGS

In November 2015**, the EPA's revised human health risk assessment for chlorpyrifos** [7] found that:

- All food exposures exceed safe levels, with children ages 1–2 exposed to levels of chlorpyrifos that are **140 times what EPA deems safe**.
- There is **no safe level** of chlorpyrifos in drinking water.
- Pesticide drift continues at unsafe levels 300 feet from the field's edge.
- Chlorpyrifos is found at unsafe levels in the air at schools, homes, and communities in agricultural areas.
- All workers who mix and apply chlorpyrifos are exposed to unsafe levels of the pesticide **even with maximum personal protective equipment** and engineering controls.
- Field workers are allowed to re-enter fields within 1–5 days after pesticide spraying, but unsafe exposures continue on average 18 days after applications.

[1] https://ehp.niehs.nih.gov/1307044/
[2] https://www.sciencedirect.com/science/article/pii/S0010945216302350
[3] https://pediatrics.aappublications.org/content/142/6/e20174161
[4] https://www.cdc.gov/nchs/products/databriefs/db291.htm
[5] https://www.tandfonline.com/doi/full/10.1080/15374416.2017.1417860
[6] https://www.regulations.gov/document?D=EPA-HQ-OPP-2015-0653-0454
[7] https://www.epa.gov/pesticides/updated-human-health-risk-analyses-chlorpyrifos

THE VERACITY OF EPA'S RISK ASSESSMENT OF CHLORPYRIFOS

You may hear opponents of HB 229 question the scientific basis of EPA's risk assessment, **claiming that** 1) EPAs Science Advisory Panel (SAP) concluded that there was insufficient evidence for a ban and also claiming that 2) one of three significant epidemiological studies conducted at Columbia University could not be replicated by the other two studies.

1) **EPA submitted its analysis to EPA's Science Advisory Panels (SAP) on multiple occasions beginning in 2008, and each time, the SAP confirmed EPA's conclusion that early life exposures to chlorpyrifos pose a risk of long-lasting, adverse cognitive, behavioral, and motor impairments. And both EPA and the SAP found that the exposures associated with serious damage to children's brains were far below the regulatory endpoint used by EPA in its 2001 and 2006 re-registration determinations, and in establishing the chlorpyrifos tolerances currently in effect.**

As early as 2000, EPA noted that, "Results of multiple studies have consistently shown that the developing brain is susceptible to chlorpyrifos treatment."(EPA, Human Health Risk Assessment: Chlorpyrifos, June 8, 2000), The SAP convened in 2008, found that laboratory studies show that "gestational or early postnatal exposures can lead to neurochemical and behavioral alterations that persist into adulthood," including long-term neurobehavioral changes in motor and cognitive behaviors. (2008 SAP Report)

2) The SAP also found the Columbia study the most sound and appropriate for use in assessing developmental toxicity of chlorpyrifos, citing "chlorpyrifos is likely associated with adverse neurodevelopmental outcomes." Finally, SAP panel members noted that the exposures in the Columbia study were below EPA's regulatory endpoint and of concern in light of evidence demonstrating that low levels of exposure to toxicants like lead, mercury, and PCBs are now known to produce significant adverse effects when they were previously thought to be harmful only at high levels.[8]

There were small differences between the Columbia and Mount Sinai studies given they were conducted by different groups of scientists in different populations, using somewhat different protocols. The Columbia University study measured amount of chlorpyrifos in umbilical cord blood whereas a Mt. Sinai study used metabolites in urine that are specific to organophosphates. Chlorpyrifos is an organophosphate. Substantial amount of experimental data supports the Columbia University findings**. The bottom-line findings were powerfully similar**, as described in an editorial by senior scientists from the National Institute of Environmental Health Sciences[9]**. The basic conclusion of both studies was essentially the same, that chlorpyrifos is associated with adverse neurodevelopmental outcomes.**

In 2012, EPA convened its SAP to review EPA's more comprehensive analysis of the neurotoxicity of chlorpyrifos. In its report, the SAP noted significant, long-term adverse effects on neurobehavioral development from chlorpyrifos in laboratory animal studies. It found that the epidemiology "studies show some consistent associations relating exposure measures to abnormal reflexes in the newborn, pervasive development disorder at 24 or 36 months, mental development at 7-9 years, and attention and behavior problems at 3 and 5 years of age.") **The Panel concurred with EPA and the 2008 SAP that "chlorpyrifos likely plays a role in impacting the neurodevelopmental outcomes examined in the three cohort studies**.
(https://www.regulations.gov/document?D=EPA-HQ-OPP-2012-0040-0029)

In December 2014, EPA released its *Revised Human Health Risk Assessment for Chlorpyrifos ("2014 RHHRA")* **and acknowledged the strong convergence in the findings from the animal studies and the three mother-child cohort studies**. It found that the laboratory animal studies indicated "that gestational and/or postnatal exposure may cause persistent behavioral effects into adulthood ...upon review of the published literature a pattern of neurodevelopmental adverse outcomes emerges." It called the cohort studies **strong studies which support a conclusion that chlorpyrifos causes long-lasting damage to children's brains** at exposures lower than EPA's

[8] https://www.regulations.gov/document?D=EPA-HQ-OPP-2008-0274-0064

[9]https://www.researchgate.net/publication/51538799_Strength_in_Numbers_Three_Separate_Studies_Link_in_Utero_Organophosphate_Pesticide_Exposure_and_Cognitive_Development

regulatory endpoint. The 2014 risk assessment also documented unsafe chlorpyrifos exposures from drinking water contamination[10].

2015: EPA proposed to revoke all chlorpyrifos tolerances based on these findings (Nov. 6, 2015). In the proposed revocation rule, **EPA explicitly and repeatedly found chlorpyrifos unsafe.**

EPA recognized that its 2014 risk assessment and 2015 proposed tolerance revocation did not address the greatest risks and most sensitive endpoint, as EPA policy requires and therefore, continued to explore ways to establish an exposure limit that would protect children from neurodevelopmental harm. Each method it explored revealed more serious risks from chlorpyrifos than the 2014 risk assessment.

In November 2016, EPA released its second revised human health risk assessment using a regulatory endpoint designed to guard against damage to children's brains**. That risk assessment found unsafe exposures from every way that people come into contact with chlorpyrifos—**on food, in drinking water, through pesticide drift, and from applying the pesticide or working in fields that had recently been sprayed. **EPA indicated it had found no chlorpyrifos uses that meet the FFDCA safety standard and all chlorpyrifos tolerances would need to be revoked.[11]**

EPA DETERMINED CHLORPYRIFOS ALSO ADVERSELY IMPACTS WILDLIFE

2017: In January 2017 the EPA released its first rigorous nationwide analysis of the effects of pesticides on endangered species, finding that **97 percent of the more than 1,800 animals and plants protected under the Endangered Species Act are likely to be harmed by** malathion and **chlorpyrifos**, including more than 100 listed bird species, fish, aquatic invertebrates, insects and crustaceans.

CHLORPYRIFOS AND POLLINATORS

Independent research underscores Chlorpyrifos also harms pollinators. According to a 2014 study, Chlorpyrifos is second only to neonicotinoids[12] as a risk to bees (third highest total, after two different types of neonics). Another 2014 study found that chlorpyrifos at hive-residue levels more than doubled larval mortality compared to untreated larvae [Zhu et al., 2014]. A ground-breaking peer-reviewed field study showed that not only does chlorpyrifos cause colony threatening brain damage to honeybees, but it does so at the sub-lethal concentrations found in the majority of fields sprayed as directed by the manufacturer [Urlacher et al., 2016]. A 2014 study listed chlorpyrifos among the top five pesticides considered the highest risk to bees [Sanchez-Bayo and Goka, 2014]. Chlorpyrifos can damage the learning and memory of bees that are exposed.

CHLORPYRIFOS AND THE CHESAPEAKE BAY

A Chesapeake Bay Program report found[13] chlorpyrifos in 90 percent of Bay water samples analyzed for this chemical, and 40 percent of those had concentrations that exceeded thresholds indicating possible ecological effects. The report found that chlorpyrifos ranks among the "top five individual toxics of concern."In 2018, the National Marine Fisheries Service reported[14] that adult and juvenile Atlantic sturgeon, which are listed as endangered, are at a high risk from exposure to chlorpyrifos because concentrations of the chemical would reduce their abundance and spawning productivity.

Chlorpyrifos toxicology studies suggest behavioral, reproductive and endocrine disruption to all aquatic arthropods, especially those in close proximity to chlorpyrifos runoff[15] [16] [17] [18] [19]

[10] Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review; Dec. 29, 2014 ; EPA- HQ-OPP-2008-0850-0195
[11] Revised Human Health Risk Assessment for Registration Review; Nov. 3, 2016; EPA- HQ-OPP-2015-0653-0454
[12] https://bit.ly/2smjenY
[13] https://bit.ly/2RoiPk3
[14] https://repository.library.noaa.gov/view/noaa/16997
[15] http://npic.orst.edu/RMPP/rmpp_main2a.pdf
[16] https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_PC-059101_1-Jul-06.pdf
[17] https://www.ncbi.nlm.nih.gov/pubmed/7531775
[18] https://www.pwrc.usgs.gov/eisler/CHR_13_Chlorpyrifos.pdf
[19] https://link.springer.com/article/10.1007/s002449900299

ALTERNATIVES TO CHLORPYRIFOS

Extensive scientific data is available on alternatives to chlorpyrifos for treating pests such as blue grass weevil on golf courses or peach tree borer on orchards. Chlorpyrifos is not needed to address the invasive spotted lanternfly. Detailed information in a report submitted with this testimony regarding specific products that can replace chlorpyrifos for specific Maryland-grown crops comes from resources including:

- **IPM Institute of North America**, Specialty Crop Grower Services - www.ipminstitute.org, www.pesticiderisk.org
- **Rutgers University, The IR-4 Project** - fifty years of successful research into sustainable crop protection in specialty crops and off-label uses, http://ir4.rutgers.edu/index.html
- **Pesticide Research Institute** – provides research, analysis, technical services, expert consulting on chemistry and toxicology of pesticides - www.pesticideresearch.com
- **PRI Pesticide Product Evaluator** - an online tool providing information for over 18,000 pesticide products, http://pesticideresearch.com/site/evaluator/

MARYLAND CITIZENS ARE CONCERNED

There is widespread and growing support among Marylanders for banning chlorpyrifos. In a 2017 OpinionWorks poll, three-quarters of voters (74 percent) favored banning this pesticide in Maryland .

This ban must come from the state legislature as the only way to ensure banning this damaging pesticide. Maryland regulators are not equipped to develop and defend a regulation banning chlorpyrifos.

We cannot rely on the federal government to protect our children, grandchildren, farmer families, farmworkers and aquatic and wild life from the dangerous and damaging impacts of chlorpyrifos. We urge this committee to pass a favorable report on HB 229 to address this urgent issue.

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THE SMART ON PESTICIDESCOALITION MEMBERS
(105 members and growing)

A.I.R Lawncare and Landscaping Services
Alliance of Nurses for a Healthy Environment
American Academy of Pediatrics–Md. Chapter
American Public Health Association–Md. Chapter
Anacostia Watershed Society
Annapolis Green
Anne Arundel Beekeepers Association
Assateague Coastal Trust
Audubon Maryland - DC
Audubon Naturalist Society
Baltimore Backyard Beekeepers Network
Baltimore Bird Club
Beyond Pesticides
Big City Farms
Bowie-Upper Marlboro Beekeepers Association
CATA, Farmworker Support Committee
Carroll County Beekeepers Association
Cecil Bird Club
Center for Food Safety
Central Maryland Beekeepers Association
Central Md. Ecumenical Council/Ecumenical Leaders Group
Charm City Meadworks
Chesapeake BaySavers
Chesapeake Physicians for Social Responsibility
Children's Environmental Health Network
Clean Bread and Cheese Creek
Clean Water Action
Common Market Co-Op
Conservation Community Consultants
Cottingham Farm
Crossroads Community Food Network
Earth Coalition
Earthjustice
Eastern Shore Food Hub
Environment Maryland
Fair Farms
F&D and Charles Smith Apiaries
Farmworker Justice
Food and Water Watch
Fox Haven Farm and Learning Center
Frederick Co. Beekeepers Association
Friends of Briers Mill Run
Friends of Lower Beaverdam Creek
Friends of Quincy Run
Friends of the Earth
Greenbelt Forest Preserve Butterfly Brigade
Hampden Community Council
Hereford Bed and Biscuit
HoneyFlower Foods
Howard County Beekeepers Association
Howard County Bird Club
Interfaith Partners of the Chesapeake
Interfaith Power & Light
Johns Hopkins Center for a Livable Future
Karma.Farm
KW Landscaping
Latino Farmers & Ranchers Assoc.–Md. Chapter
League of Women Voters of Maryland
Learning Disabilities Association–Md. Chapter
Lower Susquehanna Riverkeeper
Maryland Autism Project
Maryland Bass Nation
Maryland Conservation Council
Maryland Ethical Cannabis Association
Maryland League of Conservation Voters
Maryland Nurses Association
Maryland Organic Food and Farming Association
Maryland Ornithological Society
Maryland Pesticide Education Network
Maryland Public Interest Research Group
Maryland United for Peace and Justice
Maryland Votes for Animals
McDaniel Honey Farm
Migrant Clinicians Network
Moms Clean Air Force
MOM'S Organic Market
Montgomery Countryside Alliance
National Aquarium
National Resources Defense Council
Organic Consumers Association
Pearlstone Conference Center
Pesticide Action Network–North America
Potomac Riverkeeper
Queen Anne's Conservation Association
Rachel Carson Council
Red Top Farm
Rodale Institute
Rousedale Farm
Ruscombe Community Health Center
SafeGrow Montgomery
Safe Minds
Safe Skies Maryland
Sierra Club–Maryland Chapter
Spa Creek Conservancy
The Flower Factory
Towson Estates Association
Trout Unlimited
Washington County Beekeepers Association
Waterkeepers Chesapeake
Westport Farmers Market
Westport Neighborhood Association
Wicomico Environmental Trust

Maryland Pesticide Education Network

EVALUATING HEALTH & ENVIRONMENTAL SCIENCE

A Guide for Legislators

Scientific evidence is the underpinning for policy decisions regarding health. This checklist offers guidance for legislators listening to and assessing scientific testimony and scientific arguments on these often difficult questions, as well as help in questioning witnesses during a hearing.

1. What is the purpose, and what is the source of the research being presented?

The goal of a study may influence the outcomes. For instance, studies that a manufacturer must undertake to submit a chemical or drug for federal registration are different from studies performed by independent scientists seeking to understand impacts of chemicals on humans, animals, or the ecosystem.

What you need to know: Are government findings based on industry-provided research? Are they based on a review of all available sources?

Example: In the debate of e-cigarette / vapor product regulation, research reports by the FDA's Division of Pharmaceutical Research was very credible because it reflected totally independent testing.

2. Have the studies been peer-reviewed?

Independent scientific research is subject to review by a panel of "peers"; these are other scientists with no stake in the findings and no conflicts of interest. Peer review ensures accuracy in methodology and statistical significance, as well as proper interpretation of the results. When a study passes peer review, it is usually published in a scientific journal, such as Environmental Health Perspectives or the Journal of the American Medical Association. This is a transparent process, ensuring that rigorous standards are upheld.

What you need to know: Are the studies being cited peer reviewed? If not, consider the source. Blogs and newspaper articles are not peer-reviewed materials, but may link back to a peer-reviewed source.

Peer Reviewed

A panel of independent experts in the same scientific field, who have no connection to the study and no conflicts of interest, have reviewed it and judged it to be valid and worthy of publication.

3. How certain is "certain enough" to act?

Scientists examine facts and complex information and then look for a preponderance of evidence. While scientists routinely disclose elements of uncertainty in their research, they form their conclusions based on the weight of the evidence.

What you need to know: Is there sufficient evidence regarding possible harms that warrants taking action? Is there sufficient evidence of safety to justify inaction?

Example: Based on the preponderance of evidence of likely harm, we passed seat belt laws and prevented children from drinking alcohol.

4. Are the scientists being too cautious?

Scientists are conservative regarding "certainty." They use a "95% confidence test" in order to conclude that two observations that happen together are more than accidental and probably causal. When it comes to taking action,

however, public and environmental health experts recommend action based on sufficient scientific evidence to warrant concern and not on a specific percentage.

What you need to know: What are the risks and what could be the harm if we wait for more research to be conducted before taking action?

Example: Laws limiting human exposure to DDT, lead, tobacco and alcohol were all passed long before a 95% confidence test was met. These laws were based on a preponderance of evidence rather than 95% certainty.

Weight of the Evidence

This term refers to a judgment in the scientific community that most studies to date confirm a particular conclusion. Scientists are always open to new findings, so they may avoid using terms like "certainty", "100%" or "we are sure."

5. Are the findings influenced by funding source, trade secrets, or suppression of data?

The design of a scientific study may be influenced by the source of its funding. This has been well documented by independent observers. It is therefore reasonable and prudent for legislators to ask all scientists and those who cite scientific research about their sources of funding.

What you need to know: What are the sources of funding for the work being cited? Were any data omitted due to trade secret protections or similar reasons?

Example: 1) The source of funding for a study can influence important findings or cause contrary results to be omitted from the study's report. 2) Important data that an industry provides to a federal agency before marketing will not be in the public domain and may not have been subjected to peer review.

6. Has anyone addressed the economic harm associated with inaction?

Policy-makers must weigh not only the cost of taking action but also the cost of inaction. Science offers insight into the costs of inaction.

What You Need to Know: What public and private costs may be incurred if we do not take action on this proposed policy?

Example: A 2015 peer reviewed study estimated the costs to the EU of human exposure to endocrine disruptors at $209 billion annually in medical care and lost productivity. *(Trasande et al J Clin Endocrinol Metab. 2015 Apr; 100(4): 1245–1255.)*

Note: The fiscal note on a bill will not typically assess the costs of inaction. It addresses only the costs of adopting the policy, and usually only the costs to government.

7. Have long term effects been assessed?

Early life exposures can create high risks in later life. An example is the link between lead poisoning and long-term harms to children, or between tobacco and cancer. Over time, human exposures to multiple chemicals will have interactive effects that may be quite different from the effects of a single chemical.

What you need to know: Does the science presented also address the long-term effects of exposure? If not, is that because the research does not exist?

Note: Federal agency review does not establish absolute safety. The US EPA registers chemicals based on "reasonable certainty of no harm" and has yet to address the synergistic effects of chemicals in real life, such as interactions with other chemicals in the environment, medications, and illness.

February 12, 2020

House Environment and Transportation Committee
Chairman Barve, Vice Chair Stein and Committee Members

FAVORABLE: HB 229 – Pesticides – Use of Chlorpyrifos - Prohibition

Dear Maryland Legislators,

As scientists in the fields of biology, chemistry, ecology, ecotoxicology, entomology, sustainability and human sciences, we would like to call your attention to the irreparable harm chlorpyrifos has on the environment and human health of Maryland. The 71 signers of this letter urge you to take immediate action to protect your constituents and the environment by passing HB 229 and SB 300, which would ban this dangerous chemical.

Chlorpyrifos is a toxic pesticide derived from a nerve gas developed by Nazi Germany for use in WWII.[1] Although the EPA banned almost all residential use of Chlorpyrifos in 2000, it is still widely used in the agricultural industry.[2] Marylanders regularly come into contact with chlorpyrifos through residue on food and contaminated drinking water and air. In 2015, a Food and Drug Administration study found that chlorpyrifos is the fourth most common pesticide found in human foods.[3]

Scientific studies have linked chlorpyrifos to brain damage in children, autism, cancer, Parkinson's disease and a whole host of other negative human health impacts such as reduced IQ, loss of working memory, attention deficit disorders and delayed motor development.[4,5,6,7] Farmers, farmworkers, and rural communities have an increased risk of exposure to chlorpyrifos due to proximity to agriculture, which is associated with immediate and long-term adverse health impacts.[8,9,10]

A large body of science, including the U.S. Environmental Protection Agency's scientific review demonstrates that chlorpyrifos residues in water and food are unsafe for pregnant women and children.[11] In fact, studies indicate there are no safe levels for pregnant women since chlorpyrifos exposure can result in negative health outcomes for both the mother and fetus, such as increasing the chance of having a preterm birth.[12]

Chlorpyrifos is also extremely damaging to wildlife, namely birds, fish and pollinators. Federal scientists concluded this pesticide poses a risk to about 1,800 critically threatened or endangered species.[13] Chlorpyrifos contributes to the staggering decline of pollinators because of its sub-lethal effect on bees. In a Chesapeake Bay Program report, chlorpyrifos was found in 90 percent of Bay samples with 40 percent having concentrations exceeding thresholds.[14] Studies have found that chlorpyrifos can have negative physiological, mutagenic, and sub-lethal effects on aquatic life.[15,16,17]

Safer alternatives exist for addressing challenging pests on farms, including on orchards, vineyards, golf courses and land care.

Due to the surmounting evidence of chlorpyrifos' toxicity to humans and the environment, the U.S. Environmental Protection Agency (EPA) experts determined there was no safe way to use the chemical and recommended a complete ban.[18,19] However, former EPA Administrator Scott Pruitt denied the petition to ban chlorpyrifos as one of his first formal acts in office.[20,21]

As a result, numerous state attorneys general, including Maryland Attorney General Brian Frosh, have filed suit against the EPA challenging its ruling.[22] The state of Hawaii responded by banning chlorpyrifos and both California and New York have initiated proceedings to ban it as well.[23] In August 2018, the U.S.

Court of Appeals for the Ninth Circuit ordered EPA to ban chlorpyrifos within 60 days.[24]Days before the deadline, EPA and the Department of Justice appealed the decision and requested a re-hearing. [25]

As scientists and academics, we agree that the body of evidence on chlorpyrifos' detrimental effects to human health and the environment is conclusive. We urge the state legislature to take action where the federal government has failed. We strongly ask that Maryland legislators champion human health and environmental stewardship by passing HB 229 and SB 300 to ban the use of chlorpyrifos in Maryland this congressional session.

Sincerely,

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