UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

Petition for Review of Order of a Federal Agency, Board, Commission, or Officer

Name of Federal Agency, Board, Commission, or Officer:

ANDREW WHEELER, Administrator, United States Environmental Protection Agency [Agency Representative],

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Date of judgment or order: March 29, 2017 (82 Fed. Reg. 16,581 (April 5, 2017))
July 18, 2019 (84 Fed. Reg. 35,555 (July 24, 2019))

Fee paid for petition: Yes

List all Petitioners:

League of United Latin American Citizens
Pesticide Action Network North America
Natural Resources Defense Council
California Rural Legal Assistance Foundation
Farmworker Association of Florida
Farmworker Justice
Labor Council for Latin American Advancement
Learning Disabilities Association of America
National Hispanic Medical Association
Pineros y Campesinos Unidos del Noroeste
United Farm Workers

Related cases: *LULAC, et al. v. Andrew Wheeler, et al.*, Case No. 17-71636, United States Court of Appeals for the Ninth Circuit.

Jurisdiction: Under the Federal Food, Drug and Cosmetic Act, 21 U.S.C. § 346a(h), this Court has jurisdiction to review orders issued by the Environmental Protection Agency ("EPA") on objections filed pursuant to 21 U.S.C. § 346a(g)(2). On June 5, 2017, in accordance with 21 U.S.C. § 346a(g)(2)(A), the petitioners timely filed objections to the order issued by EPA denying a petition to ban food uses of chlorpyrifos, 82 Fed. Reg. 16,581 (April 5, 2017) ("Petition Denial Order"). On July 18, 2019, EPA issued an order under 21 U.S.C. § 346a(g)(2)(C), denying the objections in full. 84 Fed. Reg. 35,555 (July 24, 2019) ("Objections Denial Order"). Pursuant to 21 U.S.C. § 346a(h), this Court has jurisdiction to review EPA's Objections Denial Order. In its April 19, 2019 Order in the related case, *LULAC, et al. v. Andrew Wheeler, et al.*, Case No. 17-71636, Dkt. 171, the en banc court retained jurisdiction over that and any related cases.

STATEMENT

Petitioners hereby petition the United States Court of Appeals for the Ninth Circuit for review of: (1) the Petition Denial Order by Respondent EPA entitled "Chlorpyrifos; Order Denying PANNA and NRDC's Petition to Revoke Tolerances," which was issued May 29, 2017 and published in 82 Fed. Reg. 16,581 (April 5, 2017) (attached as Exhibit A); and (2) the Objections Denial Order by Respondent EPA, entitled "Chlorpyrifos; Final Order Denying Objections to March 2017 Petition Denial Order," which was issued on July 18, 2019, and

published in 84 Fed. Reg. 35,555 (July 25, 2019) (attached as Exhibit B). Petitioners and their members will be adversely affected by the challenged orders as demonstrated in the standing declarations filed in the related case, *LULAC v. Wheeler,* Case No. 17-71636 (9th Cir.). Dkt. 37-2. Pesticide Action Network North America, California Rural Legal Assistance Foundation, United Farm Workers, and Pineros y Campesinos Unidos del Noroeste have their principal place of business in this Circuit.

Petitioners initiated the related case in June 2017 by filing a petition for review of the Petition Denial Order at the same time they filed their administrative objections with EPA. A divided Panel ruled that it had jurisdiction even without a final ruling by EPA on the objections and ruled for Petitioners on the merits. 899 F.3d 814 (9th Cir. 2018). Respondent EPA moved for rehearing en banc on the jurisdictional issue, which this Court granted. On rehearing en banc, this Court ordered EPA to issue a full and final decision on the objections by July 18, 2019, and retained jurisdiction over this and any related cases. 922 F.3d 443 (9th Cir. 2019) (mem.) (en banc). This petition seeks review of the Objections Denial Order in addition to the Petition Denial Order and seeks review initially en banc pursuant to Fed. R. App. P. 35(c), consistent with the en banc Court's order.

In addition to filing this petition for review, LULAC will seek leave to amend the petition for review in the related case, *LULAC v. Wheeler*, Case No. 17-

71636, to add a challenge to the Objections Denial Order to that case. Petitioners believe it would be most efficient and facilitate an expeditious resolution to combine and hear this petition in the related case, where the administrative record, excerpts of record, and standing declarations have already been filed, and the case has already been expedited.

Respectfully submitted this 7th day of August, 2019.

s/ Patti A. Goldman
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Representation Statement for Petition for Review

Petitioner(s):

League of United Latin American Citizens
Pesticide Action Network North America
Natural Resources Defense Council
California Rural Legal Assistance Foundation
Farmworker Association of Florida
Farmworker Justice
Labor Council for Latin American Advancement
Learning Disabilities Association of America
National Hispanic Medical Association
Pineros y Campesinos Unidos del Noroeste
United Farm Workers

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Respondent(s):

ANDREW WHEELER, Administrator, United States Environmental Protection Agency, [Agency Representative]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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CERTIFICATE OF SERVICE

I hereby certify that on August 7, 2019, I electronically filed the foregoing *Petition for Review with attachments* with the Clerk of the Court for the United States Court of Appeals for the Ninth Circuit by using the CM/ECF system. The following have been served by U.S. First Class Mail and email:

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I declare under penalty of perjury that the foregoing is true and correct.

s/ Patti A. Goldman
Patti A. Goldman

Exhibit A

authorizes the Secretary of Energy to prescribe test procedures that are reasonably designed to produce results that measure energy efficiency, energy use, or estimated operating costs during a representative average-use cycle, and that are not unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) The test procedure for battery chargers is contained in Title 10 of the Code of Federal Regulations (CFR) part 430, subpart B, appendix Y, *Uniform Test Method for Measuring the Energy Consumption of Battery Chargers.*

The regulations set forth in 10 CFR 430.27 contain provisions that allow a person to seek a waiver from the test procedure requirements for a particular basic model of a type of covered product when the petitioner's basic model for which the petition for waiver was submitted contains one or more design characteristics that: (1) Prevent testing according to the prescribed test procedure, or (2) cause the prescribed test procedures to evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 430.27(a)(1).DOE may grant the waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(f)(2).

II. Dyson's Petition for Waiver: Assertions and Determinations

On April 7, 2016, Dyson filed a petition for waiver from the DOE test procedure for battery chargers under 10 CFR 430.27 for the battery charger used in their robotic vacuum cleaner model RB01, marketed as the Dyson 360-Eye (Robot), which is required to be tested using the DOE battery charger test procedure at 10 CFR 430.23(aa) and detailed at 10 CFR part 430, subpart B, appendix Y. In its petition, Dyson asks that the requirement contained in the DOE test procedure for battery chargers provided in 10 CFR part 430, subpart B, appendix Y, section 4.4, *Limiting Other Non-Battery-Charger Functions,* be waived with regard to testing of the Robot battery charger. According to subsection 4.4.b (and a related provision at section 5.6.c.1), any function controlled by the user and not associated with the battery charging process must be switched off or be set to the lowest power-consuming mode.

Dyson asserts that in order to provide the user with the advanced setting and management features of the Robot, the relevant functionalities and circuitry have to be powered at all times. Accordingly, Dyson does not believe it appropriate to make these functions, which are not associated with the battery charging process, user controllable because they are an integral part of the Robot itself. Therefore, in order to ascertain the true energy consumption characteristics of the battery charger during the test, Dyson seeks permission to switch off these functions by a means that is not controlled by the user.

Dyson also requested an interim waiver from the existing DOE test procedure, which DOE granted. See 81 FR at 62489. After reviewing the alternate procedure suggested by Dyson, DOE granted the interim waiver because DOE determined that Dyson's petition for waiver will likely be granted and decided that it was desirable for public policy reasons to grant Dyson immediate relief pending a determination on the petition for waiver. Dyson's petition was published in the **Federal Register** on September 9, 2016. 81 FR 62489. DOE received no comments regarding Dyson's petition.

On May 20, 2016, DOE published a test procedure final rule that adopted amendments to the battery charger test procedure found in Appendix Y. 81 FR 31827. Subsequently, on December 12, 2016, DOE issued a separate final rule to add a discrete test method for uninterruptible power supplies to the battery charger test procedure. 81 FR 89806. Neither of these final rules amended the provisions of the battery charger test procedure from which Dyson sought a waiver. Since the amendments in these final rules did not address the issues presented in the waiver petition, Dyson's interim waiver has remained in effect while DOE has evaluated the waiver petition. 10 CFR 430.27(h).

III. Consultations With Other Agencies

DOE consulted with the Federal Trade Commission (FTC) staff concerning the Dyson petition for waiver. The FTC staff did not have any objections to granting a waiver to Dyson.

IV. Order

After careful consideration of all the material that was submitted by Dyson and consultation with the FTC staff, in accordance with 10 CFR 430.27, it is *ordered* that:

(1) The petition for waiver submitted by the Dyson Inc. (Case No. BC–001) is hereby granted as set forth in the paragraphs below.

(2) Dyson must test and rate the Dyson basic models specified in paragraph (3) on the basis of the current test procedure contained in 10 CFR part 430, subpart B, appendix Y, except that Dyson, notwithstanding the instructions in Appendix Y sections 3.2.4 and 3.3.6, may disable power to functions not associated with the battery charging process by isolating a terminal of the battery pack using isolating tape, as shown in the Appendices to the petition for waiver.

(3) This order applies only to the following basic model: RB01, marketed as the Dyson 360-Eye ("Robot"), battery charger.

(4) This waiver shall remain in effect consistent with the provisions of 10 CFR 430.27.

Issued in Washington, DC, on March 27, 2017.

Steven G. Chalk,

Acting Assistant Secretary, Energy Efficiency and Renewable Energy

[FR Doc. 2017–06732 Filed 4–4–17; 8:45 am]

BILLING CODE –P

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OPP–2007–1005; FRL–9960–77]

Chlorpyrifos; Order Denying PANNA and NRDC's Petition To Revoke Tolerances

AGENCY: Environmental Protection Agency (EPA).

ACTION: Order.

SUMMARY: In this Order, EPA denies a petition requesting that EPA revoke all tolerances for the pesticide chlorpyrifos under section 408(d) of the Federal Food, Drug, and Cosmetic Act and cancel all chlorpyrifos registrations under the Federal Insecticide, Fungicide and Rodenticide Act. The petition was filed in September 2007 by the Pesticide Action Network North America (PANNA) and the Natural Resources Defense Council (NRDC).

DATES: This Order is effective April 5, 2017. Objections and requests for hearings must be received on or before June 5, 2017, and must be filed in accordance with the instructions provided in 40 CFR part 178 (see also Unit I. of the **SUPPLEMENTARY INFORMATION**.)

ADDRESSES: The docket for this action, identified by docket identification (ID) number EPA–HQ–OPP–2007–1005, is available at *http://www.regulations.gov* or at the Office of Pesticide Programs Regulatory Public Docket (OPP Docket) in the Environmental Protection Agency Docket Center (EPA/DC), West William Jefferson Clinton Bldg., Rm. 3334, 1301 Constitution Ave. NW., Washington, DC 20460–0001. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal

holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the OPP Docket is (703) 305–5805. Please review the visitor instructions and additional information about the docket available at *http://www.epa.gov/dockets.*

FOR FURTHER INFORMATION CONTACT: Pesticide Re-Evaluation Division (7508P), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460–0001; telephone number: (703) 347–0206; email address: *OPPChlorpyrifosInquiries@epa.gov.*

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this action apply to me?

In this document EPA denies a petition by PANNA and the NRDC to revoke pesticide tolerances and cancel pesticide registrations. This action may also be of interest to agricultural producers, food manufacturers, or pesticide manufacturers. Potentially affected entities may include, but are not limited to those engaged in the following activities:

- Crop production (North American Industrial Classification System (NAICS) code 111), *e.g.,* agricultural workers; greenhouse, nursery, and floriculture workers; farmers.
- Animal production (NAICS code 112), *e.g.,* cattle ranchers and farmers, dairy cattle farmers, livestock farmers.
- Food manufacturing (NAICS code 311), *e.g.,* agricultural workers; farmers; greenhouse, nursery, and floriculture workers; ranchers; pesticide applicators.
- Pesticide manufacturing (NAICS code 32532), *e.g.,* agricultural workers; commercial applicators; farmers, greenhouse, nursery, and floriculture workers; residential users.

This listing is not intended to be exhaustive, but rather to provide a guide for readers regarding entities likely to be affected by this action. Other types of entities not listed in this unit could also be affected. The NAICS codes have been provided to assists you and others in determining whether this action might apply to certain entities. If you have any questions regarding the applicability of this action to a particular entity, consult the person listed under **FOR FURTHER INFORMATION CONTACT.**

B. How can I get copies of this document and other related information?

EPA has established a docket for this action under Docket ID No. EPA–HQ–OPP–2007–1005. Additional information relevant to this action is located in the chlorpyrifos registration review docket under Docket ID No, EPA–HQ–OPP–2008–0850 and the chlorpyrifos tolerance rulemaking docket under Docket ID No, EPA–HQ–OPP–2015–0653. To access the electronic docket, go to *http://www.regulations.gov,* select "Advanced Search," then "Docket Search." Insert the docket ID number where indicated and select the "Submit" button. Follow the instructions on the regulations.gov Web site to view the docket index or access available documents. All documents in the docket are listed in the docket index available in regulations.gov. Although listed in the index, some information is not publicly available, *e.g.,* Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available in the electronic docket or, if only available in hard copy, at the OPP Regulatory Public Docket in Rm. S–4400, One Potomac Yard (South Bldg.), 2777 S. Crystal Dr., Arlington, VA. The Docket Facility is open from 8:30 a.m. to 4 p.m. Monday through Friday, excluding legal holidays. The Docket Facility telephone number is (703) 305–5805.

C. Can I file an objection or hearing request?

Under section 408(g) of the Federal Food, Drug and Cosmetic Act (FFDCA) (21 U.S.C. 346a(g)), any person may file an objection to any aspect of this order and may also request a hearing on those objections. You must file your objection or request a hearing on this order in accordance with the instructions provided in 40 CFR part 178. To ensure proper receipt by EPA, you must identify docket ID number EPA–HQ–OPP–2007–1005 in the subject line on the first page of your submission. All objections and requests for a hearing must be in writing, and must be received by the Hearing Clerk on or before June 5, 2017, and may be submitted by one of the following methods:

- *Mail:* U.S. EPA Office of Administrative Law Judges, Mailcode 1900R, 1200 Pennsylvania Ave. NW., Washington, DC 20460
- *Hand Delivery:* U.S. Environmental Protection Agency Office of Administrative Law Judges, Ronald Reagan Building, Rm. M1200, 1300 Pennsylvania Ave. NW., Washington, DC 20004. Deliveries are only accepted during the Office's normal hours of operation (8:30 a.m. to 4 p.m., Monday through Friday, excluding legal holidays). Special arrangements should be made for deliveries of boxed information. The Office's telephone number is (202) 564–6255.

In addition to filing an objection or hearing request with the Hearing Clerk as described in 40 CFR part 178, please submit a copy of the filing that does not contain CBI for inclusion in the public docket that is described in I.B.1 above. Information not marked confidential pursuant to 40 CFR part 2 may be disclosed publicly by EPA without prior notice. Submit this copy, identified by docket ID number EPA–HQ–OPP–2007–1005, by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the on-line instructions for submitting comments.
- *Mail:* U.S. Environmental Protection Agency Office of Pesticide Programs (OPP) Public Regulatory Docket (7502P), 1200 Pennsylvania, Ave. NW., Washington, DC 20460–0001.
- *Delivery:* OPP Regulatory Public Docket (7502P), Environmental Protection Agency, Rm. S–4400, One Potomac Yard (South Bldg.), 2777 S. Crystal Dr., Arlington, VA. Deliveries are only accepted during the Docket's normal hours of operation (8:30 a.m. to 4 p.m., Monday through Friday, excluding legal holidays). Special arrangements should be made for deliveries of boxed information. The Docket Facility telephone number is (703) 305–5805.

D. What should be included in objections?

The objection stage is the second stage in the petition process under FFDCA section 408. This multi-stage process is initiated by a petition requesting establishment, modification, or revocation of a tolerance. Once EPA makes a decision on a petition, and publishes its decision in the **Federal Register**, the second stage of the petition process is triggered. At this point, parties who disagree with EPA's decision, whether it is a decision to grant or deny the petition, may file objections with EPA to the decision made. The objection stage gives parties a chance to seek review of EPA's decision before the Agency. This is an opportunity for parties to contest the conclusions EPA reached and the determinations underlying those conclusions. As an administrative review stage, it is not an opportunity to raise new issues or arguments or present facts or information that were available earlier. On the other hand, parties must do more than repeat the claims in the petition. The objection stage is the opportunity to challenge EPA's decision on the petition. An objection fails on its

face if it does not identify aspects of EPA's decision believed to be in error and explain the reason why EPA's decision is incorrect. This two-stage process insures that issues are fully aired before the Agency and a comprehensive record is compiled, prior to judicial review.

II. Introduction

A. What action is the Agency taking?

In this document, EPA denies a petition by PANNA and the NRDC. In a petition dated September 12, 2007, PANNA and NRDC (the petitioners) requested that EPA revoke all tolerances for the pesticide chlorpyrifos established under section 408 of the FFDCA. (Ref. 1) The petition also sought the cancellation of all chlorpyrifos pesticide product registrations under section 6 the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), 7 U.S.C. 136d. The PANNA and NRDC petition (the Petition) raised the following claims regarding EPA's reregistration and active registrations of chlorpyrifos in support of the request for tolerance revocation and product cancellation:

1. EPA has ignored genetic evidence of vulnerable populations.
2. EPA has needlessly delayed a decision regarding endocrine disrupting effects.
3. EPA has ignored data regarding cancer risks.
4. EPA's 2006 cumulative risk assessment (CRA) for the organophosphates misrepresented risks and failed to apply FQPA 10X safety factor. [For convenience's sake, the legal requirements regarding the additional safety margin for infants and children in section 408(b)(2)(C) of the FFDCA are referred to throughout this response as the "FQPA 10X safety factor" or simply the "FQPA safety factor." Due to Congress' focus on both pre- and post-natal toxicity, EPA has interpreted this additional safety factor as pertaining to risks to infants and children that arise due to pre-natal exposure as well as to exposure during childhood years.]
5. EPA has over-relied on registrant data.
6. EPA has failed to properly address the exporting hazard in foreign countries from chlorpyrifos.
7. EPA has failed to quantitatively incorporate data demonstrating long-lasting effects from early life exposure to chlorpyrifos in children.
8. EPA has disregarded data demonstrating that there is no evidence of a safe level of exposure during pre-birth and early life stages.
9. EPA has failed to cite or quantitatively incorporate studies and clinical reports suggesting potential adverse effects below 10% cholinesterase inhibition.
10. EPA has failed to incorporate inhalation routes of exposure.

In this order EPA is denying the Petition in full. EPA provided the petitioners with two interim responses on July 16, 2012, and July 15, 2014, respectively. The July 16, 2012, response denied claim 6 (export hazard) completely and that portion of the response was a final agency action. The remainder of the July 16, 2012, response and the July 15, 2014, response expressed EPA's intention to deny six other petition claims (1–5 and 10). [In the 2012 response, EPA did, however, inform petitioners of its approval of label mitigation (in the form of rate reductions and spray drift buffers) to reduce bystander risks, including risks from inhalation exposure, which in effect partially granted petition claim 10.] EPA made clear in both the 2012 and 2014 responses that, absent a request from petitioners, EPA's denial of those six claims would not be made final until EPA finalized its response to the entire Petition. Petitioners made no such request. EPA is finalizing its denial of those six claims in this order.

The remaining claims (7–9) all related to same issue: Whether the potential exists for chlorpyrifos to cause neurodevelopmental effects in children at exposure levels below EPA's existing regulatory standard (10% cholinesterase inhibition). While these claims raised novel, highly complex and unresolved scientific issues, EPA decided it would nonetheless expedite the registration review of chlorpyrifos under FIFRA section 3(g), and attempt to address these issues several years in advance of the October 1, 2022 deadline for completing that review. Accordingly, EPA also decided as a policy matter that it would address the Petition claims raising these matters on a similar timeframe. Although EPA had expedited its registration review to address these issues, the petitioners were not satisfied with EPA's progress in responding to the Petition and they brought legal action in the 9th Circuit Court of Appeals to compel EPA to either issue an order denying the Petition or to grant the Petition by initiating the tolerance revocation process. In August 2015, the 9th Circuit issued a ruling in favor of the petitioners and ordered EPA to respond to the Petition by either denying the Petition or issuing a proposed or final rule revoking chlorpyrifos tolerances. *In re Pesticide Action Network of North America* v. *EPA,* 798 F.3d (9th Cir. 2015).

On November 6, 2015, pursuant to the 9th Circuit's order, EPA proposed to revoke all chlorpyrifos tolerances based in part on uncertainty surrounding the potential for chlorpyrifos to cause neurodevelopmental effects—the issue raised in petition claims 7–9. Following publication of the proposal, the 9th Circuit announced that it would retain jurisdiction over this matter and on August 12, 2016, the court further ordered EPA to complete a final petition response by March 31, 2017 and made clear that no further extensions would be granted. On November 17, 2016, EPA published a notice of data availability that released for public comment EPA's revised risk assessment that proposed a new regulatory point of departure based on the potential for chlorpyrifos to result in adverse neurodevelopmental effects.

Following a review of comments on both the November 2015 proposal and the November 2016 notice of data availability, EPA has concluded that, despite several years of study, the science addressing neurodevelopmental effects remains unresolved and that further evaluation of the science during the remaining time for completion of registration review is warranted to achieve greater certainty as to whether the potential exists for adverse neurodevelopmental effects to occur from current human exposures to chlorpyrifos. EPA has therefore concluded that it will not complete the human health portion of the registration review or any associated tolerance revocation of chlorpyrifos without first attempting to come to a clearer scientific resolution on those issues. As noted, Congress has provided that EPA must complete registration review by October 1, 2022. Because the 9th Circuit's August 12, 2016 order has made clear, however, that further extensions to the March 31, 2017 deadline for responding to the Petition would not be granted, EPA is today also denying all remaining petition claims.

B. What is the Agency's authority for taking this action?

Under section 408(d)(4) of the FFDCA, EPA is authorized to respond to a section 408(d) petition to revoke tolerance either by issuing a final rule revoking the tolerances, issuing a proposed rule, or issuing an order denying the Petition.

III. Statutory and Regulatory Background

A. FFDCA/FIFRA and Applicable Regulations

1. *In general.* EPA establishes maximum residue limits, or "tolerances," for pesticide residues in food and feed commodities under section 408 of the FFDCA. Without such a tolerance or an exemption from the requirement of a tolerance, a food containing a pesticide residue is "adulterated" under section 402 of the FFDCA and may not be legally moved in interstate commerce. Section 408 was substantially rewritten by the Food Quality Protection Act of 1996 (FQPA) (Pub. L. 104–170, 110 Stat. 1489 (1996)), which established a detailed safety standard for pesticides and integrated EPA's regulation of pesticide food residues under the FFDCA with EPA's registration and re-evaluation of pesticides under FIFRA. The standard for issuing or maintaining a tolerance under section 408(b)(2)(A)(i) of the FFDCA is whether it is "safe." "Safe" is defined by section 408(b)(2)(A)(ii) to mean that "there is a reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures for which there is reliable information."

While the FFDCA authorizes the establishment of legal limits for pesticide residues in food, section 3(a) of FIFRA requires the approval of pesticides prior to their sale and distribution, and establishes a registration regime for regulating the use of pesticides. FIFRA regulates pesticide use in conjunction with its registration scheme by requiring EPA review and approval of pesticide labels and specifying that use of a pesticide inconsistent with its label is a violation of federal law. In the FQPA, Congress integrated action under the two statutes by requiring that the safety standard under the FFDCA be used as a criterion in FIFRA registration actions as to pesticide uses which result in dietary risk from residues in or on food, (*see* FIFRA section 2(bb)), and directing that EPA coordinate, to the extent practicable, revocations of tolerances with pesticide cancellations under FIFRA. (*See* FFDCA section 408(l)(1).) Under section 3(g) of FIFRA, EPA is required to re-evaluate pesticides under the FIFRA standard—which includes a determination regarding the safety of existing FFDCA tolerances—every 15 years under a program known as "registration review." The deadline for completing the registration review for chlorpyrifos is October 1, 2022.

2. *Procedures for establishing, amending, or revoking tolerances.* Tolerances are established, amended, or revoked by rulemaking under the unique procedural framework set forth in the FFDCA. Generally, a tolerance rulemaking is initiated by the party seeking to establish, amend, or revoke a tolerance by means of filing a petition with EPA. (*See* FFDCA section 408(d)(1).) EPA publishes in the **Federal Register** a notice of the petition filing and requests public comment. After reviewing the petition, and any comments received on it, section 408(d)(4) provides that EPA may issue a final rule establishing, amending, or revoking the tolerance, issue a proposed rule to do the same, or deny the petition.

Once EPA takes final action on the petition by establishing, amending, or revoking the tolerance or denying the petition, section 408(g)(2) allows any party to file objections with EPA and seek an evidentiary hearing on those objections. Objections and hearing requests must be filed within 60 days. Section 408(g)(2)(B) provides that EPA shall "hold a public evidentiary hearing if and to the extent the Administrator determines that such a public hearing is necessary to receive factual evidence relevant to material issues of fact raised by the objections." EPA regulations make clear that hearings will only be granted where it is shown that there is "a genuine and substantial issue of fact," the requestor has identified evidence 'which "would, if established, resolve one or more of such issues in favor of the requestor," and the issue is "determinative" with regard to the relief requested. (40 CFR 178.32(b).) Further, a party may not raise issues in objections unless they were part of the petition and an objecting party must state objections to the EPA decision and not just repeat the allegations in its petition. *Corn Growers* v. *EPA,* 613 F.2d 266 (D.C. Cir. 2010), cert. denied, 131 S. Ct. 2931 (2011). EPA's final order on the objections is subject to judicial review. (21 U.S.C. 346a(h)(1).)

IV. Chlorpyrifos Regulatory Background

Chlorpyrifos (0,0-diethyl-0-3,5,6-trichloro-2-pyridyl phosphorothioate) is a broad-spectrum, chlorinated organophosphate (OP) insecticide that has been registered for use in the United States since 1965. By pounds of active ingredient, it is the most widely used conventional insecticide in the country. Currently registered use sites include a large variety of food crops (including tree fruits and nuts, many types of small fruits and vegetables, including vegetable seed treatments, grain/oilseed crops, and cotton, for example), and non-food use settings (*e.g.,* ornamental and agricultural seed production, non-residential turf, industrial sites/rights of way, greenhouse and nursery production, sod farms, pulpwood production, public health and wood protection). For some of these crops, chlorpyrifos is currently the only cost-effective choice for control of certain insect pests. In 2000, the chlorpyrifos registrants reached an agreement with EPA to voluntarily cancel all residential use products except those registered for ant and roach baits in child-resistant packaging and fire ant mound treatments.

In 2006, EPA completed FIFRA section 4 reregistration and FFDCA tolerance reassessment for chlorpyrifos and the OP class of pesticides. Having completed reregistration and tolerance reassessment, EPA is required to complete the next re-evaluation of chlorpyrifos under the FIFRA section 3(g) registration review program by October 1, 2022. Given ongoing scientific developments in the study of the OPs generally, in March 2009 EPA announced its decision to prioritize the FIFRA section 3(g) registration review of chlorpyrifos by opening a public docket and releasing a preliminary work plan to complete the chlorpyrifos registration review by 2015—7 years in advance of the date required by law.

The registration review of chlorpyrifos and the OPs has presented EPA with numerous novel scientific issues that the agency has taken to multiple FIFRA Scientific Advisory Panel (SAP) meetings since the completion of reregistration. [The SAP is a federal advisory committee created by section 25(d) of FIFRA, that serves as EPA's primary source of peer review for significant regulatory and policy matters involving pesticides.] Many of these complex scientific issues formed the basis of the 2007 petition filed by PANNA and NRDC and EPA therefore decided to address the Petition on a similar timeframe to EPA's expedited registration review schedule.

Although EPA expedited the chlorpyrifos registration review in an attempt to address the novel scientific issues raised by the Petition in advance of the statutory deadline, the petitioners were dissatisfied with the pace of EPA's response efforts and have sued EPA in federal court on three separate occasions to compel a faster response to the Petition. As explained in Unit V., EPA had addressed 7 of the 10 claims asserted in the Petition by either

denying the claim, issuing a preliminary denial or approving label mitigation to address the claims, but on June 10, 2015, in the *PANNA* decision, the U.S. Court of Appeals for the Ninth Circuit signaled its intent to order EPA to complete its response to the Petition and directed EPA to inform the court how—and by when—EPA intended to respond. On June 30, 2015, EPA informed the court that it intended to propose by April 15, 2016, the revocation of all chlorpyrifos tolerances in the absence of pesticide label mitigation that ensures that exposures will be safe. On August 10, 2015, the court rejected EPA's time line and issued a mandamus order directing EPA to "issue either a proposed or final revocation rule or a full and final response to the administrative Petition by October 31, 2015."

On October 30, 2015, EPA issued a proposed rule to revoke all chlorpyrifos tolerances which it published in the **Federal Register** on November 6, 2015 (80 FR 69080). On December 10, 2015, the Ninth Circuit issued a further order requiring EPA to complete any final rule (or petition denial) and fully respond to the Petition by December 30, 2016. On June 30, 2016, EPA sought a 6-month extension to that deadline in order to allow EPA to fully consider the most recent views of the FIFRA SAP with respect to chlorpyrifos toxicology. The FIFRA SAP report was finalized and made available for EPA consideration on July 20, 2016. (Ref. 2) On August 12, 2016, the court rejected EPA's request for a 6-month extension and ordered EPA to complete its final action by March 31, 2017 (effectively granting EPA a three-month extension). On November 17, 2016, EPA published a notice of data availability (NODA) seeking public comment on both EPA's revised risk and water assessments and reopening the comment period on the proposal to revoke all chlorpyrifos (81 FR 81049). The comment period for the NODA closed on January 17, 2017.

V. Ruling on Petition

This order denies the Petition on the nine remaining grounds for which EPA has not issued a final denial that can be the subject of objections under section 408(g)(2) of the FFDCA. As noted in Unit II, on July 16, 2012, EPA denied as final agency action petitioners' claim 6 that the registration of chlorpyrifos created an export hazard for workers in foreign countries. That response and the response of July 15, 2014, also included EPA's preliminary denial of petition claims 1–5 and 10 (except to the extent EPA granted that claim) and EPA's responses to those claims are now incorporated into this order as set forth below. This unit also includes EPA's basis for denying petition claims 7–9. Each specific petition claim is summarized in this Unit V. immediately prior to EPA's response to the claim.

1. Genetic Evidence of Vulnerable Populations

a. Petitioners' claim. Petitioners claim that as part of EPA's reregistration decision (which was completed in 2006 with the completion of the organophosphate cumulative risk assessment) the Agency failed to calculate an appropriate intra-species uncertainty factor (*i.e.*, within human variability) for chlorpyrifos in both its aggregate and cumulative risk assessments (CRA). They assert that certain relevant, robust data, specifically the Furlong et al. (2006) study (Ref. 3) that addresses intra-species variability in the behavior of the detoxifying enzyme paraoxonase (PON1), indicate that the Agency should have applied an intra-species safety factor "of at least 150X in the aggregate and cumulative assessments" rather than the 10X factor EPA applied. Petitioners conclude by noting that applying an intra-species factor of 100X or higher would require setting tolerances below the level of detection, which therefore should compel EPA to revoke all chlorpyrifos tolerances.

b. Agency Response. Petitioners are correct that the Agency, as part of the 2006 OP CRA, evaluated, but did not rely on Furlong et al. in setting the intra-species uncertainty factor for that assessment. The Agency did not rely on the results of the PON1 data in the OP CRA because these data do not take into consideration the complexity of OP metabolism, which involves multiple metabolic enzymes, not just PON1. In addition, EPA believes the methodology utilized in the Furlong et al. study to measure intra-species variability—*i.e.*, combining values from multiple species (transgenic mice and human) to determine the range of sensitivity within a single species—is not consistent with well-established international risk assessment practices. Further, EPA believes that petitioners' assertion that the Furlong et al. study supports an intra-species uncertainty factor of at least 150X is based on an analysis of the data that is inconsistent with EPA policy and widely-accepted international guidance on the development of intra-species uncertainty factors. In addition, the 2008 FIFRA SAP did not support the use of the Furlong et al (2006) study alone in deriving an intra-species factor. For these reasons, and as further explained below, EPA believes it is not appropriate to solely rely on the results of the Furlong et al. study, or petitioners' interpretation of those results, for purposes of determining the intra-species uncertainty factor. To determine that factor, EPA first uses science tools to quantitatively characterize human variability in both exposure and dosimetry, and then determines the appropriate intra-species uncertainty factor to protect sensitive populations. Specifically, for chlorpyrifos, EPA uses a physiologically-based pharmacokinetic (PBPK) model to account for human variability in the absorption, distribution, metabolism and excretion (ADME) of chemicals based on key physiological, biochemicals, and physicochemical determinants of these ADME processes, including the influence of PON1 variability.

Addressing human variability and sensitive populations is an important aspect of the Agency's risk assessment process. The Agency is well aware of the issue of PON1 and has examined the scientific evidence on this source of genetic variability. PON1 is one of the key detoxification enzymes of chlorpyrifos and is included as part of the PBPK model used by EPA in the 2014 human health risk assessment (HHRA) and 2016 revised risk assessment. Specifically, PON1 is an A-esterase which can metabolize chlorpyrifos-oxon without inactivating the enzyme. (Ref. 4) Indeed, as part of the 2008 SAP, EPA performed a literature review of PON1 and its possible use in informing the intra-species (*i.e.*, within human variability) uncertainty factor. This literature review can be found in the draft Appendix E: Data Derived Extrapolation Factor Analysis to the draft Science Issue Paper: Chlorpyrifos Hazard and Dose Response Characterization. (Ref. 5) In sum, the Agency considered available PON1 data from more than 25 studies from diverse human populations worldwide.

The Agency focused on the PON1–192 polymorphism since it has been linked to chlorpyrifos-oxon sensitivity in experimental toxicology studies and, has been evaluated in epidemiology studies attempting to associate PON1 status with health outcomes following OP pesticide exposure in adults and children (Holland et al., 2006; Chen et al., 2003. (Ref. 6). [Note, Holland et al. (2006) and Furlong et al. (2006) report findings from the same cohort. The Holland reference provides enzymes activities for specific polymorphisms in Table 4; the Furlong paper does not report such values and provides

information primarily in graphical form.] However, EPA believes that focusing on PON1 variability in isolation from other metabolic action is not an appropriate approach for developing a data-driven uncertainty factor. The Agency solicited feedback from the SAP on the utility of the PON1 data, by itself, for use in risk assessment; the SAP was similarly not supportive of using such data in isolation. Specifically, the SAP report states:

> *. . . the information on PON1 polymorphisms should not be used as the sole factor in a data-derived uncertainty factor for two main reasons: (1) it is only one enzyme in a complex pathway, and is subsequent to the bioactivation reaction; therefore it can only function on the amount of bioactivation product (i.e., chlorpyrifos-oxon) that is delivered to it by CYP450); and (2) the genotype of PON1 alone is insufficient to predict vulnerability because the overall level of enzyme activity is ultimately what determines detoxification potential from that pathway; thus, it is better to use PON1 status because it provides information regarding PON1 genotype and activity. Some of the data from laboratory animal studies in PON knockout animals are using an unrealistic animal model and frequently very high dose levels, and do not reflect what might happen in humans.* (Ref. 7)

Based on a detailed review of the literature and the comments from the SAP, the Agency has determined that such data are not appropriate for use alone in deriving an intra-species uncertainty factor for use in human health risk assessment. As indicated by the SAP report, multiple factors (*e.g.,* other enzymes such as P450s, carboxylesterases, butyrylcholinesterase) are likely to impact potential population sensitivity, rendering the results of the PON1 data, by themselves, insufficiently reliable to support a regulatory conclusion about the potential variation of human sensitivity to chlorpyrifos.

Since the 2008 SAP, several epidemiological studies have been published that considered the association between PON status/genotype and health outcome. Hofmann et al. (2009) recently reported associations between PON1 status and inhibition of butyrylcholinesterase (BuChE) in a group of pesticide handlers in Washington. The authors note that this study requires replication with larger sample size(s) and more blood samples. (Ref. 8) Given the limitations of Hofmann et al., the Agency has not drawn any conclusions from this study. The Q/R–192 and/or C/T–108 polymorphism at the promoter site have been evaluated recently as a factor affecting birth or neurobehavioral outcomes following gestational exposure to OPs. (Refs. 9, 10, 11) These studies (Eskanazi., et al., 2010 (Ref. 9); Harley et al., 2011 (Ref. 10); Engel et al., 2011 (Ref. 11)) were evaluated by EPA in preparation for the April 2012 SAP review.

Petitioners further emphasize that the Furlong et al. study supports an intra-species uncertainty factor of over 164X given the range of variability seen in that study. The 164X value is derived from sensitivity observed in transgenic mice expressing human PON1Q–192 compared with mice expressing human PON1R–192 combined with the range of plasma arylesterase (AREase) from the newborn with the lowest PON1 level compared with the mother with the highest PON1 level from a group of 130 maternal-newborn pairs from the CHAMACOS (Center for the Health Assessment of Mothers and Children of Salinas) cohort.

EPA believes it is fundamentally at odds with international risk assessment practices to combine values from both mouse and human data to determine the potential range of variability within a single species—regardless of whether the test animals express a human PON1 enzyme. As the 2008 FIFRA SAP explained, PON1 is but a single enzyme that should not be considered in isolation to predict the overall level of enzyme activity that may affect human sensitivity to a substance. Using a 164X intra-species uncertainty factor derived from the Furlong et al. study would take this practice one step further by relying upon combined PON1 values from different species with differing overall metabolic activity to derive the intra-species factor. EPA does not believe this approach is an appropriate means of determining the potential range of intra-species variability.

Finally, petitioners' assertion that the Furlong study supports an intra-species uncertainty factor of at least 150X is based on an analysis of that study that is inconsistent with EPA policy and widely-accepted international guidance on the development of intra-species uncertainty factors. In deriving the intra-species uncertainty factor in its risk assessments, EPA is guided by the principles of the 2005 IPCS (Ref. 12) guidance on chemical specific adjustment factors (CSAFs) and the EPA's 2014 Guidance for Applying Quantitative Data to Develop Data-Derived Extrapolation Factors for Interspecies and Intraspecies Extrapolation. (Ref. 13) These guidances recommend that intra-species factors should be extrapolated from a measure of central tendency in the population to a measure in the sensitive population (*i.e.,* to extrapolate from a typical human to a sensitive human). To base the factor on the difference between the single lowest and highest measurements in a given study, as petitioners suggest in this instance, would likely greatly exaggerate potential intra-species variability. That approach effectively assumes that the point of departure in an EPA risk assessment will be derived from the least sensitive test subject, thereby necessitating the application of an intra-species factor that accounts for the full range of sensitivity across a species. Since EPA does not develop its PoDs in this fashion; the approach suggested by petitioners is not appropriate.

In summary, the Agency has carefully considered the issue of PON1 variability and determined that data addressing PON1 in isolation are not appropriate for use alone in deriving an intra-species uncertainty factor and that the issue is more appropriately handled using a PBPK model. Further, the derivation of the 164X value advocated by the petitioners is based on combining values from humanized mice with human measured values with a range from highest to lowest; the Furlong et al. derivation is inappropriate and inconsistent with international risk assessment practice. (Ref. 2) The 2008 FIFRA SAP did not support the PON1 data used in isolation. Finally, petitioners' statement that the Furlong et al. study supports an intra-species uncertainty factor of at least 150X likely overstates potential variability. EPA therefore denies this aspect of the Petition.

2. Endocrine Disrupting Effects

a. Petitioners' claim. Petitioners summarize a number of studies evaluating the effects of chlorpyrifos on the endocrine system, asserting that, taken together, the studies "suggest that chlorpyrifos may be an endocrine disrupting chemical, capable of interfering with multiple hormones controlling reproduction and neurodevelopment." The petitioners then assert that EPA should not have delayed consideration of endocrine effects absent finalization of the Endocrine Disruptor Screening Program (EDSP) (Ref. 14) and should have quantitatively incorporated the studies into the chlorpyrifos IRED.

b. Agency Response. This portion of the Petition appears largely to be a complaint about the completeness of EPA's reregistration decision and a request that EPA undertake quantitative incorporation of endocrine endpoints into its assessment of chlorpyrifos. The Petition does not explain whether and

how endocrine effects should form the basis of a decision to revoke tolerances. The basis for seeking revocation of a tolerance is a showing that the pesticide is not "safe." Petitioners have neither asserted that EPA should revoke tolerances because effects on the endocrine system render the tolerances unsafe, nor have petitioners submitted a factual analysis demonstrating that aggregate exposure to chlorpyrifos presents an unsafe risk to humans based on effects on the endocrine system. Rather, the Petition appears to collect a number of studies suggesting that chlorpyrifos may have effects on the endocrine system and that EPA should have considered those health impacts at reregistration in a quantitative assessment.

To the extent that petitioners are seeking tolerance revocation on these grounds, the Petition fails to provide a sufficient basis for revocation because, in addition to the preceding defects, the cited data do not provide quantitative data (*i.e.*, endpoints/points of departure) that indicate endocrine effects at doses that are more sensitive than the points of departure used in the chlorpyrifos risk assessment that are based on cholinesterase inhibition. While the cited studies provide qualitative information that exposure to chlorpyrifos may be associated with effects on the androgen and thyroid hormonal pathways, these data alone do not demonstrate that current human exposures from existing tolerances are unsafe. The Agency noted similar effects during its evaluation of information submitted by People for the Ethical Treatment of Animals (PETA) and the Physicians Committee for Responsible Medicine (PCRM) during its review of existing information as part of EPA's EDSP, as discussed below. Based on the review of that data, EPA concluded that the effects seen in those studies do not call into question EPA's prior safety determinations supporting the existing tolerances; the data do not indicate a risk warranting regulatory action, and the petitioners have provided no specific information to alter this determination.

Consequently, the Petition does not support a conclusion that existing tolerances are unsafe due to potential endocrine effects. This portion of the Petition is therefore denied.

As petitioners may be aware, since the filing of the petition, EPA has completed the evaluation of chlorpyrifos under EPA's EDSP, as required under FFDCA section 408(p) that confirms EPA's conclusions. On April 15, 2009, a **Federal Register** notice was published in which chlorpyrifos was included in the initial list of chemicals (List 1) to receive EDSP Tier 1 test orders. The EDSP program is a two-tiered screening and testing program, Tier 1 and Tier 2 tests. Tier 1 includes 11 assays in the battery; these data are intended to allow EPA to determine whether certain substances (including pesticide active and other ingredients) have the potential to interact with the endocrine system and cause an effect in humans or wildlife similar to an effect produced by a "naturally occurring estrogen, or other such endocrine effects as the Administrator may designate." The purpose of Tier 2 tests is to identify and establish a quantitative, dose-response relationship for any adverse effects that might result from the interactions with the endocrine system.

On November 5, 2009, EPA issued Tier 1 test orders to the registrants of chlorpyrifos, requiring a battery of 11 screening assays to identify the potential to interact with the estrogen, androgen, or thyroid hormonal systems. (Ref. 15)

The agency received and reviewed all 11 EDSP Tier 1 screening assays for chlorpyrifos. On June 29, 2015, the agency completed the EDSP weight of evidence (WoE) conclusions for the Tier 1 screening assays for List 1 chemicals, including chlorpyrifos. In addition to the Tier 1 data, the WoE evaluations considered other scientifically relevant information (OSRI), including general toxicity data and open literature studies of sufficient quality. In determining whether chlorpyrifos interacts with the estrogen, androgen or thyroid pathways, the agency considered the number and type of effects induced, the magnitude and pattern of responses observed across studies, taxa, and sexes. Additionally, the agency also considered the conditions under which effects occurred, in particular whether or not endocrine-related responses occurred at dose(s) that also resulted in general systemic or overt toxicity. The agency concluded that, based on weight of evidence considerations, EDSP Tier 2 testing is not recommended for chlorpyrifos since there was no evidence of potential interaction with the estrogen, androgen and thyroid pathways. The EDSP Tier 1 WoE assessment and associated data evaluation records for chlorpyrifos are available online. (Ref. 16) This assessment further supports EPA's denial of this portion of the Petition.

3. Cancer Risks

a. Petitioners' claim. Petitioners claim that the Agency "ignored" a December 2004 National Institutes of Health Agricultural Health Study (AHS) by Lee et al. (2004) (Ref. 17) that evaluated the association between chlorpyrifos and lung cancer incidence. (Ref. 17) The petition summarizes the results of the AHS study, stating that the incidence of lung cancer has a statistically significant association with chlorpyrifos exposure. The Petition then asserts that these data are highly relevant and therefore should have been referenced in the final aggregate assessment for chlorpyrifos or the OP CRA. Petitioners do not otherwise explain whether and how these data support the revocation of tolerances or the cancellation of pesticide registrations.

b. Agency Response. As explained in the previous section, the basis for seeking revocation of a tolerance is a showing that the pesticide is not "safe." Claiming that EPA failed to reference certain data in its risk assessment regarding carcinogenicity does not amount to illustrating that the tolerances are unsafe. To show a lack of safety, petitioners would have to present some fact-based argument demonstrating that aggregate exposure to chlorpyrifos poses an unsafe carcinogenic risk. Petitioners have not presented such an analysis. Accordingly, EPA is denying the Petition to revoke chlorpyrifos tolerances or cancel chlorpyrifos registrations to the extent the Petition relies on claims pertaining to carcinogenicity.

Despite the inadequacy of petitioners' cancer claims, in the course of the Agency's review of chlorpyrifos, EPA has examined the Lee et al. study cited by petitioners (Ref. 17) among other lines of evidence. EPA has concluded that the Lee et al. investigation does not alter the Agency's weight of evidence determination concerning chlorpyrifos' carcinogenic potential, and therefore does not alter the Agency's current cancer classification for chlorpyrifos. Specifically, the Agency does not believe this evidence raises sufficient grounds for concern regarding chlorpyrifos that EPA should consider initiating action based upon this information that might lead to revocation of the chlorpyrifos tolerances or cancellation of the chlorpyrifos registrations.

The Agency was aware of the December 2004 study cited by petitioners. While Lee et al. observed a possible association between chlorpyrifos use and the incidence of lung cancer, the authors also stressed that further evaluation was necessary before concluding the association was causal in nature. (Ref. 17) Additional evaluation is necessary because of

possible alternative explanations for the Lee et al. study, which include unmeasured confounding factors or confounding factors not fully accounted for in the analysis, and possible false positive results due to the performance of multiple statistical tests.

EPA has been a collaborating agency with the AHS since 1993, and continues to closely monitor the AHS literature. The Agency is working closely with the AHS researchers to clearly understand the results of their research efforts to ensure the Agency appropriately interprets these data as future studies are published. Between 2003 and 2009 there have been six nested case-control analyses within the AHS which evaluated the use of a number of agricultural pesticides, including chlorpyrifos, in association with specific anatomical cancer sites, in addition to the previously published cohort study (Ref. 17) cited by the petitioners. As noted below, both the Agency and Health Canada have comprehensively reviewed these data.

In accordance with the Agency's 2005 Guideline for Cancer Risk Assessment (Ref. 18), chlorpyrifos is classified as "Not Likely to be Carcinogenic to Humans" based on the lack of evidence of carcinogenicity in male or female mice and male or female rats. In chronic toxicity/carcinogenicity studies, animals received chlorpyrifos in their feed every day of their lives (78 weeks for mice and 104 weeks for rats) at doses thousands of times greater than any anticipated exposure to humans from authorized uses. There was no evidence of cancer in the experimental animal studies. Additionally, available evidence from *in vivo* and *in vitro* assays did not support a mutagenic or genotoxic potential of chlorpyrifos.

Recently, the Agency conducted its own review of the six nested case-control analyses and one cohort study within the AHS concerning the carcinogenic potential of chlorpyrifos. (Ref. 19) EPA concluded with respect to the AHS lung cancer results that the findings are useful for generating hypotheses, but require confirmation in future studies. This conclusion is consistent with that of researchers from Health Canada. Specifically, Weichenthal et al. (2010) (Ref. 20) published a review article in Environmental Health Perspectives on pesticide exposure and cancer incidence in the AHS cohort. Their review of these same studies concluded that the weight of experimental toxicological evidence does not suggest that chlorpyrifos is carcinogenic, and that epidemiologic results currently available from the AHS are inconsistent, lack replication, and lack a coherent biologically plausible carcinogenic mode of action. The authors did note positive exposure-response associations for chlorpyrifos and lung cancer in two separate evaluations.

In summary, while there is initial suggestive epidemiological evidence of an association between chlorpyrifos and lung cancer to only form a hypothesis as to a carcinogenic mode of action, additional research (including follow-up AHS research) is needed to test the hypothesis. Consequently, at this time it is reasonable to conclude chlorpyrifos is not a carcinogen in view of the lack of carcinogenicity in the rodent bioassays and the lack of a genotoxic or mutagenic potential. The Agency concludes that existing epidemiological data (including Lee et al.) do not change the current weight of the evidence conclusions. The Agency continues to believe there is not a sufficient basis to alter its assessment of chlorpyrifos as not likely to be carcinogenic to humans when multiple lines of evidence are considered (*e.g.*, epidemiology findings, rodent bioassay, genotoxicity); therefore, chlorpyrifos cancer risk would not be a factor in any potential Agency risk determination to revoke tolerances for chlorpyrifos.

4. CRA Misrepresents Risks, Failed To Apply FQPA10X Safety Factor

a. Petitioners' claim. Petitioners assert that EPA relied on limited data and inaccurate interpretations of data to support its decision to remove the FQPA safety factor in the 2006 OP CRA. Specifically, the petitioners challenge the Agency's use of data from a paper by Zheng et al. (2000) (Ref. 21) claiming that, in contrast to the Agency's analysis of the study data, the data does show an obvious difference between juvenile and adult responses to chlorpyrifos. Petitioners conclude by asserting that the Zheng et al. study supports using a 10X safety factor for chlorpyrifos in the CRA.

b. Agency Response. Petitioners' assertions do not provide a sufficient basis for revoking chlorpyrifos tolerances. As explained previously, the ground for seeking revocation of a tolerance is a showing that the pesticide is not "safe." The petitioners' claim that the data EPA relied upon support a different FQPA safety factor for chlorpyrifos in the CRA does not amount to a showing that chlorpyrifos tolerances are unsafe. To show a lack of safety, petitioners would have to present a factual analysis demonstrating that the lack of a 10X safety factor in the CRA for chlorpyrifos poses unsafe cumulative exposures to the OPs. Petitioners have not made such a showing. For this reason, EPA is denying the petitioners' request to revoke chlorpyrifos tolerances or cancel chlorpyrifos registrations to the extent that request relies on claims pertaining to EPA's failure to provide a 10X safety factor in the 2006 CRA based on the results of the Zheng et al. study.

Despite the inadequacy of petitioners' FQPA safety factor claims, EPA examined the evidence cited by petitioners for the purpose of evaluating whether the evidence raises sufficient grounds for concern regarding chlorpyrifos that EPA should consider initiating the actions sought by the petitioners.

In general, when the Agency conducts a cumulative assessment, the scope of cumulative risk is limited to the common mechanism endpoint—which in this case of the 2006 OP CRA, was cholinesterase inhibition, the primary toxicity mode of action for the OPs. As such, for the OP CRA, experimental toxicology data on AChE inhibition were used for developing relative potency estimates, points of departure, and informing the FQPA safety factor used in the OP CRA. EPA relied on brain AChE data from adult female rats dosed for 21 days or longer for estimating relative potency and points of departure. At approximately three weeks of oral exposure to OPs, AChE inhibition reaches steady state in the adult rat such that continued dosing does not result in increased inhibition. This timeframe of toxicity (21-days and longer) was selected as there was high confidence in the potency estimates derived from the steady state toxicology studies due to the stability of the AChE inhibition.

The Agency's 2006 OP CRA contained EPA's complete FQPA safety factor analysis, (Ref. 22) which involved consideration of pre-natal and post-natal experimental toxicology studies, in addition to exposure information. In the OP CRA, pre-natal exposure AChE studies in rats show that the fetus is no more sensitive than the dam to AChE inhibition and the fetus is often less sensitive than the dam. Thus, evaluating the potential for increased toxicity of juveniles from post-natal exposure was a key component in determining the magnitude of the FQPA safety factors in the OP CRA. Furthermore, because characteristics of children are directly accounted for in the cumulative exposure assessment, the Agency's methods did not underestimate exposure to OPs.

In the 2006 OP CRA, each OP was assigned a 10X FQPA safety factor unless chemical-specific AChE data on young animals were available to

generate a data derived safety factor. To best match the relative potency factor (RPF)s and PODs based on repeated dosing, the Agency used repeated dosing data in juveniles for developing the FQPA safety factors. For chlorpyrifos, at the time of the 2006 OP CRA, the only such data available were from the Zheng et al. literature study.

The petitioners are correct that Dr. Carey Pope of Oklahoma State University provided the Agency with the raw data from the Zheng et al. study. These raw data were used to develop the plot in the 2006 OP CRA which was reproduced in the Petition. Petitioners accurately note that for other OPs a benchmark dose modeling approach was used and that no BMD values were reported for chlorpyrifos. In determining the FQPA safety factor, petitioners claim that the Agency misinterpreted the brain AChE data from Zheng et al.

As shown in the plot reproduced on page 15 of the Petition, the dose-response data in the Zheng et al. study are variable and lack a monotonic shape at the low dose end of the dose response curve. The Agency acknowledges that at the high dose, the pups appear to be more sensitive. However, at the low dose end of the response curve, relevant for human exposures and, thus, the cumulative risk assessment (*i.e.*, at or near the 10% inhibition level), little to no difference is observed. Therefore, despite the lack of BMD estimates for the Zheng et al. study, the Agency is confident in the value used to address the common mechanism endpoint (AChE inhibition) addressed in the 2006 CRA. Since that time, the Agency attempted BMD modeling of the Zheng et al. data as part of the 2011 preliminary chlorpyrifos HHRA (Ref. 23) which yielded low confidence results due to the variability in the data.

Dow AgroSciences submitted a comparative cholinesterase study (CCA) for chlorpyrifos. CCA studies are specially designed studies to compare the dose-response relationship in juvenile and adult rats. This CCA study includes two components: (1) Acute, single dosing in post-natal day 11 and young adult rats and (2) 11-days of repeating dosing in rat pups from PND11–21 and 11-days of repeated dosing in adult rats. The CCA study for chlorpyrifos is considered by EPA to be high quality and well-designed. The preliminary risk assessment for chlorpyrifos' reports BMD estimates from this CCA study. Specifically, for the repeated dosing portion of the study, the BMD_{10s} of 0.80 (0.69 $BMDL_{10}$) and 1.0 (0.95 $BMDL_{10}$) mg/kg/day respectively for female pups and adults support the FQPA safety factor of 1X for the AChE inhibition endpoint used in the 2006 OP CRA. As such, petitioners' claims regarding the CRA and FQPA safety factor is denied.

5. Over-Reliance on Registrant Data

a. Petitioners' claims. Petitioners assert that in reregistering chlorpyrifos EPA "cherry picked" data, "ignoring robust, peer-reviewed data in favor of weak, industry-sponsored data to determine that chlorpyrifos could be re-registered and food tolerances be retained." As such, the Agency's reassessment decision is not scientifically defensible.

b. Agency response. This portion of the Petition does not purport to be an independent basis for revoking chlorpyrifos tolerances or cancelling chlorpyrifos registrations. Rather, this claim appears to underlie petitioners' arguments in other sections of the Petition. While petitioners claim that EPA ignored robust, peer-reviewed data in favor of weak, industry-sponsored data for the reregistration of chlorpyrifos, petitioners do not cite to any studies other than those used to support their other claims. In general, petitioners did not provide any studies in the Petition that EPA failed to evaluate. Since the specific studies cited by petitioners are not associated with this claim, but rather their other claims, EPA's response to the specific studies are, therefore, addressed in its responses to petitioners' other claims. However, EPA explains below why, as a general matter, the Agency does not believe it "over-relied" on registrant data in evaluating the risks of chlorpyrifos in its 2006 reregistration decision.

In spite of petitioners' claim, the Agency does not ignore robust, peer-reviewed data in favor of industry-sponsored data. Further, EPA has a very public and well-documented set of procedures that it applies to the use and significance accorded all data utilized to inform risk management decisions. Registrant generated data, in response to FIFRA and FFDCA requirements, are conducted and evaluated in accordance with a series of internationally harmonized and scientifically peer-reviewed study protocols designed to maintain a high standard of scientific quality and reproducibility. (Refs. 23 and 24.)

Additionally, to further inform the Agency's risk assessment, EPA is committed to the consideration of other sources of information such as data identified in the open, peer-reviewed literature and information submitted by the public as part of the regulatory evaluation of a pesticide. An important issue, when evaluating any study, is its scientific soundness and quality, and thus, the level of confidence in the study findings to contribute to the risk assessment.

The literature was searched, fully considered, and provided additional information on, chlorpyrifos mode of action, pharmacokinetics, epidemiology, neurobehavioral effects in laboratory animals, and age dependent sensitivity to cholinesterase inhibition.

Therefore, by evaluating registrant data in accordance with internationally harmonized and scientifically peer-reviewed study protocols, undertaking thorough open literature searches, and considering information provided by the public, the Agency is confident that its assessment for chlorpyrifos in 2006 was reasonably based upon the best available science at the time of the assessment. Previous sections of this response to petitioners' claims regarding the Agency's inadequate use of various data only further highlights and supports the scientifically defensible results of the Agency's assessment. Petitioners' claim that the Agency overly relies on registrant data is therefore denied.

6. EPA Has Failed To Properly Address the Exporting Hazard in Foreign Countries From Chlorpyrifos

As noted in Unit II., in EPA's July 16, 2012 interim petition response EPA issued a final denial of this claim. That denial constituted final agency action and EPA is not reopening consideration of that claim.

7.–9. EPA Failed To Quantitatively Incorporate Data Demonstrating Long-Lasting Effects From Early Life Exposure to Chlorpyrifos in Children; EPA Disregarded Data Demonstrating That There Is No Evidence of a Safe Level of Exposure During Pre-Birth and Early Life Stages; EPA Failed To Cite or Quantitatively Incorporate Studies and Clinical Reports Suggesting Potential Adverse Effects Below 10% Cholinesterase Inhibition

a. *Petitioners' claims.* The petitioners assert that human epidemiology and rodent developmental neurotoxicity data suggest that pre-natal and early life exposure to chlorpyrifos can result in long-lasting, possibly permanent damage to the nervous system and that these effects are likely occurring at exposure levels below 10% cholinesterase inhibition, EPA's existing regulatory standard for chlorpyrifos and other OPs. They assert that EPA has therefore used the wrong endpoint as a basis for regulation and that, taking into account the full spectrum of toxicity,

chlorpyrifos does not meet the FFDCA safety standard or the FIFRA standard for registration.

b. Agency response. EPA has grouped claims 7–9 together because they fundamentally all raise the same issue: Whether the potential exists for chlorpyrifos to cause neurodevelopmental effects in infants and children from exposures (either to mothers during pregnancy or directly to infants and children) that are lower than those resulting in 10% cholinesterase inhibition—the basis for EPA's long-standing point of departure in regulating chlorpyrifos and other OPs. While petitioners may perhaps disagree, unlike the claims addressed above, these claims were not truly challenges to EPA's 2006 reregistration decision for chlorpyrifos, but rather, challenges to EPA's ongoing approval of chlorpyrifos under FIFRA and the FFDCA that rely in large measure on data published after EPA completed both its 2001 chlorpyrifos Interim Reregistration Decision and the 2006 OP CRA that concluded the reregistration process for chlorpyrifos and all other OPs. As matters that largely came to light after the completion of reregistration, these petition issues are issues to be addressed as part of the registration review of chlorpyrifos—the next round of re-evaluation under section 3(g) of FIFRA. As petitioners are aware, past EPA administrations prioritized the registration review of the OPs in no small measure to begin to focus on the question of OP neurodevelopmental toxicity, which was, and remains, an issue at the cutting edge of science, involving significant uncertainties. EPA has three times presented approaches and proposals to the FIFRA SAP for evaluating recent epidemiologic data (some of which is cited in the Petition) exploring the possible connection between *in utero* and early childhood exposure to chlorpyrifos and adverse neurodevelopmental effects. The SAP's reports have rendered numerous recommendations for additional study and sometimes conflicting advice for how EPA should consider (or not consider) the epidemiology data in conducting EPA's registration review human health risk assessment for chlorpyrifos. While industry and public interest groups on both sides of this issue can debate what the recommendations mean and which recommendations should be followed, one thing should be clear to all persons following this issue: the science on this question is not resolved and would likely benefit from additional inquiry.

EPA has, however, been unable to persuade the 9th Circuit Court of Appeals that further inquiry into this area of unsettled science should delay EPA's response to the Petition. Faced with an order requiring EPA to respond to the Petition, in October 2015, EPA chose to issue a proposed rule to revoke all chlorpyrifos tolerances based in part on the uncertain science surrounding neurodevelopmental toxicity suggested by certain epidemiology studies. The comments EPA has received on that proposal and on EPA's November 17, 2016 NODA suggest that there continue to be considerable areas of uncertainty with regard to what the epidemiology data show and deep disagreement over how those data should be considered in EPA's risk assessment.

Although not a legal consideration, it is important to recognize that for many decades chlorpyrifos has been and remains one of the most widely used pesticides in the United States, making any decision to retain or remove this pesticide from the market an extremely significant policy choice. In light of the significance of this decision and in light of the significant uncertainty that exists regarding the potential for chlorpyrifos to cause adverse neurodevelopmental effects, EPA's preference is to fully explore approaches raised by the SAP and commenters on the proposed rule, and possibly seek additional authoritative peer review of EPA's risk assessment prior to finalizing any regulatory action in the course of registration review. As the 9th Circuit has made clear in its August 12, 2016 order in *PANNA* v. *EPA,* EPA must provide a final response to the Petition by March 31, 2017, regardless of whether the science remains unsettled and irrespective of whatever options may exist for more a complete resolution of these issues during the registration review process.

While EPA acknowledges its obligation to respond to the Petition as required by the court, the court's order does not and cannot compel EPA to complete the registration review of chlorpyrifos in advance of the October 1, 2022 deadline provided in section 3(g) of FIFRA, 7 U.S.C. 136a(g). Although past EPA administrations had chosen to attempt to complete that review several years in advance of the statutory deadline (and respond to the Petition on the same time frame), it has turned out that it is not possible to fully address these issues early in the registration review period. As a result, EPA has concluded that it should alter its priorities and adjust the schedule for chlorpyrifos so that it can complete its review of the science addressing neurodevelopmental effects prior to making a final registration review decision whether to retain, limit or remove chlorpyrifos from the market. Accordingly, EPA is denying these Petition claims and intends to complete a full and appropriate review of the neurodevelopmental data before either finalizing the proposed rule of October 30, 2015, or taking an alternative regulatory path.

EPA's denial of the Petition on the grounds provided above is wholly consistent with governing law. The petition provision in FFDCA section 408(d) does not address the timing for responding to this petition nor does it limit the extent to which EPA may coordinate its petition responses with the registration review provisions of FIFRA section 3(g). Further, provided EPA completes registration review by October 1, 2022, Congress otherwise gave the EPA Administrator the discretion to determine the schedule and timing for completing the review of the approximately over 1000 pesticide active ingredients currently subject to evaluation under section 3(g). EPA may lawfully re-prioritize the registration review schedule developed by earlier administrations provided that decision is consistent with law and an appropriate exercise of discretion. *See Federal Communications Commission* v. *Fox Television Stations,* 129 S.Ct. 1800 (2009) (Administrative Procedure Act does not require that a policy change be justified by reasons more substantial than those required to adopt a policy in the first instance). Nothing in FIFRA section 3(g) precludes EPA from altering a previously established registration review schedule. Given the absence of a clear statutory directive, FIFRA and the FFDCA provide EPA with discretion to take into account EPA's registration review of a pesticide in determining how and when the Agency responds to FFDCA petitions to revoke tolerances. As outlined above, given the importance of this matter and the fact that critical questions remain regarding the significance of the data addressing neurodevelopmental effects, EPA believes there is good reason to extend the registration review of chlorpyrifos and therefore to deny the Petition. To find otherwise would effectively give petitioners under the FFDCA the authority to re-order scheduling decisions regarding the FIFRA registration review process that Congress has vested in the Administrator.

10. Inhalation Exposure From Volatilization

a. Petitioners' claim. Petitioners assert that when EPA completed its 2006 OP CRA, EPA failed to consider and

incorporate significant exposures to chlorpyrifos-contaminated air that exist for some populations in communities where chlorpyrifos is applied. Petitioners assert that these exposures exceeded safe levels when considering cholinesterase inhibition as a point of departure and that developmental neurotoxicity may occur at even lower exposure levels than those resulting in cholinesterase inhibition.

b. Agency response. To the extent petitioners are asserting that human exposure to chlorpyrifos spray drift and volatilized chlorpyrifos present neurodevelopmental risks for infants and children, EPA is denying this claim for the reasons stated above in our response to claims 7–9. As noted, EPA believes that, given the uncertainties associated with this identified risk concern, the appropriate course of action is for EPA to deny the Petition and work to further resolve this area of unsettled science in the time remaining for the completion of registration review under section 3(g) of FIFRA.

With respect to petitioners' claim that exposures to spray drift and volatilized chlorpyrifos present a risk from cholinesterase inhibition, EPA is denying the Petition for the reasons previously identified in EPA's Spray Drift Mitigation Decision of July 16, 2012 [EPA–HQ–OPP–2008–0850] and EPA's interim response of July 15, 2014 [EPA–HQ–OPP–2007–1005] addressing chlorpyrifos volatilization. In the Spray Drift Mitigation Decision, EPA determined that the chlorpyrifos registrants' adoption of label mitigation (in the form of label use rate reductions and no spray buffer zones) eliminated risk from cholinesterase inhibition as a result of spray drift. As for risks presented by volatilized chlorpyrifos that may occur following application, EPA's July 15, 2014 interim response to the Petition explained that recent vapor phase inhalation studies for both chlorpyrifos and chlorpyrifos-oxon made clear that neither vapor phase chlorpyrifos nor chlorpyrifos-oxon presents a risk of cholinesterase inhibition. Specifically, those studies, as indicated in EPA's memorandum, *Chlorpyrifos: Reevaluation of the Potential Risks from Volatilization in Consideration of Chlorpyrifos Parent and Oxon Vapor Inhalation Toxicity Studies* (Ref. 25), revealed that levels of chlorpyrifos and chlorpyrifos-oxon in vapor form are much lower than the levels seen in earlier aerosol studies that are better suited for evaluating spray drift. Indeed, no cholinesterase inhibition was observed in either volatility study. What is clear from these data is that the air cannot hold levels of volatilized chlorpyrifos or its oxon that are capable of causing adverse effects from cholinesterase inhibition.

VI. Regulatory Assessment Requirements

As indicated previously, this action announces the Agency's order denying a petition filed, in part, under section 408(d) of FFDCA. As such, this action is an adjudication and not a rule. The regulatory assessment requirements applicable to rulemaking do not, therefore, apply to this action.

VII. Submission to Congress and the Comptroller General

The Congressional Review Act, 5 U.S.C. 801 *et seq.,* does not apply because this action is not a rule for purposes of 5 U.S.C. 804(3).

IX. References

The following is a listing of the documents that are specifically referenced in this document. The docket includes these documents and other information considered by EPA, including documents that are referenced within the documents that are included in the docket, even if the referenced document is not physically located in the docket. For assistance in locating these other documents, please consult the technical person listed under **FOR FURTHER INFORMATION CONTACT.**

1. The Petition from NRDC and PANNA and EPA's various responses to it are available in docket number EPA–HQ–OPP–2007–1005 available at *http://www.regulations.gov.*
2. FIFRA Scientific Advisory Panel (2016). "Chlorpyrifos: Analysis of Biomonitoring Data". Available at: *https://www.epa.gov/sap/meeting-materials-april-19-21-2016-scientific-advisory-panel.*
3. Furlong CE, Holland N, Richter RJ, Bradman A, Ho A, Eskenazi B (2006). PON1status of farmworker mothers and children as a predictor of organophosphate sensitivity. Pharmacogenet Genomics. 2006 Mar; 16(3):183–90.
4. Sultatos LG; Murphy SD, (1983). Kinetic Analysis Of The Microsomal Biotransformation Of The Phosphorothioate Insecticides Chlorpyrifos And Parathion. Fundemental and Applied Toxicology. 3:16–21.
5. U.S. EPA (2008). Draft Appendix E available at *http://www.epa.gov/scipoly/sap/meetings/2008/september/appendixe.pdf.* Draft Science Issue Paper: Chlorpyrifos Hazard and Dose Response Characterization. August 21, 2008. Available at *http://www.epa.gov/scipoly/sap/meetings/2008/september/chlorpyrifoscharacter.pdf.*
6. Holland, N., Furlong, C., Bastaki, M., Richter, R., Bradman, A., Huen, K., Beckman, K., and Eskenazi, B. (2006). Paraoxonase polymorphisms, haplotypes, and enzyme activity in Latino mothers and newborns. Environ. Health Perspect. 114(7), 985–991; Chen, J., Kumar, M., Chan, W., Berkowitz, G., and Wetmur, J. (2003). Increased Influence of Genetic Variation on PON1 Activity in Neonates. Environmental Health Perspective 111, 11:1403–9.
7. U.S. EPA (2008). Transmittal of Meeting Minutes of the FIFRA Scientific Advisory Panel Meeting Held September 16–18, 2008 on the Agency's Evaluation of the Toxicity Profile of Chlorpyrifos. Available at *http://www.epa.gov/scipoly/sap/meetings/2008/september/sap0908report.pdf* at 61.
8. Engel, S.M., Wetmur, J., Chen, J., Zhu, C., Boyd Barr, D., Canfield, R.L., Wolff, M.S., (2011) Prenatal Exposure to Organophosphates, Paraoxonase 1, and Cognitive Development in Childhood Environ Health Perspect 119:1182–1188 (2011). doi:10.1289/ehp.1003183 [Online 21 April 2011].
9. Hofmann, J.N., Keifer, M.C., Furlong, C.E., De Roos, A.J., Farin., F.M., Fenske, R.A., van Belle, G., Checkoway, H. (2009) Serum Cholinesterase Inhibition in Relation to Paraoxonase-1 (PON1) Status among Organophosphate-Exposed Agricultural Pesticide Handlers./Environ Health Perspect 117:1402–1408 (2009). doi:10.1289/ehp.0900682. Available at *http://dx.doi.org/* [Online 9 June 2009].
10. Eskenazi, B; Huen, K., Marks, A., Harley, K.G., Bradman, A., Boyd Barr, D., Holland, N. (2010) PON1 and Neurodevelopment in Children from the CHAMACOS Study Exposed to Organophosphate Pesticides in Utero. Environmental Health Perspectives. Vol. 118 (12): 1775–1781).
11. Harley KG, Huen K, Schall RA, Holland NT, Bradman A, *et al.,*(2011) Association of Organophosphate Pesticide Exposure and Paraoxonase with Birth Outcome in Mexican-American Women. PLoS ONE 6(8): e23923. doi:10.1371/journal.pone.0023923.
12. IPCS (International Programme on Chemical Safety) 2005. Chemical-Specific Adjustment Factors for Interspecies Differences and Human Variability: Guidance Document for Use of Data in Dose/Concentration-Response Assessment. Harmonization Project Document No. 2. World Health Organization, International Programme on Chemical Safety, Geneva, Switzerland.
13. U.S. EPA (2014). Guidance for Applying Quantitative Data to Develop Data-Derived Extrapolation Factors for Interspecies and Intraspecies Extrapolation. Available at *https://www.epa.gov/risk/guidance-applying-quantitative-data-develop-data-derived-extrapolation-factors-interspecies-and.*
14. For additional information on the Endocrine Disruptor Screening program see *http://www.epa.gov/endo/.*
15. For information related to the status of EDSP test orders/DCIs, status of EDSP OSRI: order recipient submissions and

EPA responses, and other EDSP assay information see *http://www.epa.gov/endo/pubs/toresources/index.htm.*
16. For available Data Evaluation Records (DERs) for EDSP Tier 1, see *https://www.epa.gov/endocrine-disruption/endocrine-disruptor-screening-program-tier-1-screening-determinations-and.*
17. Hoppin JA, Lubin JH, Rusiecki JA, Sandler DP, Dosemeci M, Alavanja MC. (2004) Cancer incidence among pesticide applicators exposed to chlorpyrifos in the Agricultural Health Study. *J Natl Cancer Inst, 96*(23), 1781–1789. (hereinafter Lee *et al.*, 2004).
18. U.S. EPA (2005). Guidelines for Carcinogen Risk Assessment. Available at *http://www.epa.gov/raf/publications/pdfs/CANCER_GUIDELINES_FINAL_3-25-05.PDF.*
19. Christenson, C. (2011). D388167, Chlorpyrifos Carcinogenicity: Review of Evidence from the U.S. Agricultural Health Study (AHS) Epidemiologic Evaluations 2003–2009.
20. Weichenthal S, Moase C, Chan P (2010). A review of pesticide exposure and cancer incidence in the agricultural health study cohort. Cien Saude Colet. 2012 Jan;17(1):255–70. PubMed PMID: 22218559.
21. Zheng Q, Olivier K, Won YK, Pope CN. (2000). Comparative cholinergic neurotoxicity of oral chlorpyrifos exposures in pre-weaning and adult rats. Toxicological Sciences, 55(1): 124–132.
22. For additional information on the organophosphate cumulative risk assessment, see *http://epa.gov/pesticides/cumulative/2006-op/op_cra_main.pdf.*
23. U.S. EPA (2011). Chlorpyrifos: Preliminary Human Health Risk Assessment for Registration. Available in docket number EPA–HQ–OPP–2008–0850, *http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPP-2008-0850-0025.*
(23) For additional information on EPA's Harmonized Test Guidelines and international efforts at harmonization, see *http://www.epa.gov/opp00001/science/guidelines.htm.*
(24) Available at *http://www.regulations.gov* in docket EPA–HQ–OPP–2008–0850.

Authority: 7 U.S.C. 136 *et seq.* and 21 U.S.C. 346a.

Dated: March 29, 2017.

E. Scott Pruitt,

Administrator.

[FR Doc. 2017–06777 Filed 4–4–17; 8:45 am]

BILLING CODE 6560–50–P

FEDERAL MARITIME COMMISSION

Notice of Agreements Filed

The Commission hereby gives notice of the filing of the following agreements under the Shipping Act of 1984. Interested parties may submit comments on the agreements to the Secretary, Federal Maritime Commission, Washington, DC 20573, within twelve days of the date this notice appears in the **Federal Register**. Copies of the agreements are available through the Commission's Web site (*www.fmc.gov*) or by contacting the Office of Agreements at (202)-523–5793 or *tradeanalysis@fmc.gov.*

Agreement No.: 010071–045.

Title: Cruise Lines International Association Agreement.

Parties: A-Rosa Flussschiff GmbH; Acromas Shipping, Ltd./Saga Shipping; Aida Cruises; AMA Waterways; American Cruise Lines, Inc.; Aqua Expeditions Pte. Ltd.; Australian Pacific Touring Pty Ltd.; Avalon Waterways; Azamara Cruises; Carnival Cruise Lines; Celebrity Cruises, Inc.; Celestyal Cruises; Costa Cruise Lines; Compagnie Du Ponant; Croisieurope; Crystal Cruises; Cunard Line; Disney Cruise Line; Dream Cruises Management Ltd.; Emerald Waterways; French America Line; Hapag-Lloyd Kreuzfahrten Gmbh; Heritage River Journeys Pvt Ltd.; Holland America Line; Luftner Cruises; MSC Cruises; NCL Corporation; Oceania Cruises; P & O Cruises; P & O Cruises Australia; PandaW River Expeditions; Paul Gauguin Cruises; Pearl Seas Cruises; Princess Cruises; Pullmantur Cruises Ship Management Ltd.; Regent Seven Seas Cruises; Riviera Tours Ltd.; Royal Caribbean International; Scenic Luxury Cruises & Tours Ltd.; Seabourn Cruise Line; SeaDream Yacht Club; Shearings Holidays Ltd.; Silversea Cruises, Ltd.; Star Cruises (HK) Limited; St. Helena Line/Andrew Weir Shipping Ltd.; Tauck River Cruising; Thomson Cruises; Travelmarvel; Tui Cruises Gmbh; Uniworld River Cruises, Inc.; Venice Simplon-Orient-Express Ltd./Belmond; and Windstar Cruises.

Filing Party: Andre Picciurro, Esq. Kaye, Rose & Partners, LLP; Emerald Plaza, 402 West Broadway, Suite 1300; San Diego, CA 92101–3542.

Synopsis: The Amendment would update the Agreement membership and revise language in the Agreement regarding the election of the Chair and Vice Chair of the Agreement.

Agreement No.: 012476.

Title: HSDG/HLAG/CMA CGM Slot Charter Agreement.

Parties: Hamburg Sud; Hapag-Lloyd AG; and CMA CGM S.A.

Filing Party: Wayne Rohde; Cozen O'Connor; 1200 19th Street NW., Washington, DC 20036.

Synopsis: The Agreement authorizes HSDG and HLAG to charter space to CMA CGM in the trade between the U.S. East Coast on the one hand, and Colombia, Ecuador, Peru and Chile on the other hand. The Parties have requested expedited review.

Agreement No.: 012477.

Title: CMA CGM/HLAG U.S.-West Med Slot Charter Agreement.

Parties: CMA CGM, S.A.; and Hapag Lloyd AG.

Filing Party: Draughn B. Arbona, Esq; CMA CGM (America) LLC; 5701 Lake Wright Drive; Norfolk, VA 23502.

Synopsis: This Agreement authorizes CMA CGM to charter space to HLAG in the trade between Italy and Spain on the one hand, and the U.S. East Coast on the other hand.

Agreement No.: 012478.

Title: NYK/OOCL Space Charter Agreement.

Parties: Nippon Yusen Kaisha and Orient Overseas Container Line Limited.

Filing Party: Joshua P. Stein; Cozen O'Connor; 1200 Nineteenth Street NW., Washington, DC 20036.

Synopsis: The Agreement authorizes NYK to charter space to OOCL on the service referred to as the PS1 and operated under THE Alliance Agreement (FMC Agreement No. 012439) and to enter into arrangements related to the chartering of such space.

By Order of the Federal Maritime Commission.

Dated: March 31, 2017.

Rachel E. Dickon,

Assistant Secretary.

[FR Doc. 2017–06734 Filed 4–4–17; 8:45 am]

BILLING CODE 6731–AA–P

FEDERAL RESERVE SYSTEM

Change in Bank Control Notices; Acquisitions of Shares of a Bank or Bank Holding Company

The notificants listed below have applied under the Change in Bank Control Act (12 U.S.C. 1817(j)) and 225.41 of the Board's Regulation Y (12 CFR 225.41) to acquire shares of a bank or bank holding company. The factors that are considered in acting on the notices are set forth in paragraph 7 of the Act (12 U.S.C. 1817(j)(7)).

The notices are available for immediate inspection at the Federal Reserve Bank indicated. The notices also will be available for inspection at the offices of the Board of Governors. Interested persons may express their views in writing to the Reserve Bank indicated for that notice or to the offices of the Board of Governors. Comments must be received not later than April 21, 2017.

A. Federal Reserve Bank of Minneapolis (Jacquelyn K. Brunmeier, Assistant Vice President) 90 Hennepin Avenue, Minneapolis, Minnesota 55480–0291:

Exhibit B

Commodity	Parts per million
Poultry, fat	0.02
Poultry, meat	0.1
Poultry, meat byproducts	0.3
* * * * * * *	
Rye, forage	1
Rye, grain	0.08
Rye, hay	1.5
Rye, straw	2
Sheep, fat	0.2
Sheep, meat	0.4
Sheep, meat byproducts	0.8
Sorghum, grain, forage	0.4
Sorghum, grain, grain	0.3
Sorghum, grain, stover	1
* * * * * * *	
Sunflower subgroup 20B	0.3
Teff, forage	1
Teff, grain	0.08
Teff, hay	1.5
Teff, straw	2
Teosinte, grain	0.015
* * * * * * *	
Triticale, forage	1
Triticale, grain	0.08
Triticale, hay	1.5
Triticale, straw	2
Vegetable, *brassica*, head and stem, group 5–16, except cauliflower	2
* * * * * * *	

[1] This tolerance expires on January 24, 2020.

* * * * *

[FR Doc. 2019–15648 Filed 7–23–19; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 180

[EPA–HQ–OPP–2007–1005; FRL–9997–06]

Chlorpyrifos; Final Order Denying Objections to March 2017 Petition Denial Order

AGENCY: Environmental Protection Agency (EPA).

ACTION: Order.

SUMMARY: In this Order, EPA denies the objections to EPA's March 29, 2017 order denying a 2007 petition from the Pesticide Action Network North America (PANNA) and the Natural Resources Defense Council (NRDC) to revoke all tolerances and cancel all registrations for the insecticide chlorpyrifos. This order is issued under section 408(g)(2)(C) of the Federal Food, Drug, and Cosmetic Act (FFDCA) and constitutes final agency action on the 2007 petition. The objections were filed by Earthjustice on behalf of 12 public interest groups, the North Coast Rivers Alliance, and the States of New York, Washington, California, Massachusetts, Maine, Maryland, and Vermont.

DATES: This Order is effective July 24, 2019.

ADDRESSES: The docket for this action, identified by docket identification (ID) number EPA–HQ–OPP–2007–1005, is available at *http://www.regulations.gov* or at the Office of Pesticide Programs Regulatory Public Docket (OPP Docket) in the Environmental Protection Agency Docket Center (EPA/DC), West William Jefferson Clinton Bldg., Rm. 3334, 1301 Constitution Ave. NW, Washington, DC 20460–0001. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the OPP Docket is (703) 305–5805. Please review the visitor instructions and additional information about the docket available at *http://www.epa.gov/dockets.*

FOR FURTHER INFORMATION CONTACT: Pesticide Re-Evaluation Division (7508P), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave. NW, Washington, DC 20460–0001; telephone number: (703) 347–0206; email address: *OPPChlorpyrifosInquiries@epa.gov.*

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this action apply to me?

In this document, EPA denies all objections in response to a March 29, 2017 order denying the 2007 PANNA and NRDC petition requesting that EPA revoke all tolerances and cancel all pesticide product registrations for chlorpyrifos. In addition to the Petitioners, this action may be of interest to agricultural producers, food manufacturers or pesticide manufacturers, and others interested in food safety issues generally. The following list of North American Industrial Classification System (NAICS) codes is not intended to be exhaustive, but rather provides a guide to help readers determine whether this document applies to them. Potentially affected entities may include:

- Crop production (NAICS code 111), *e.g.,* agricultural workers; greenhouse, nursery, and floriculture workers; farmers.
- Animal production (NAICS code 112), *e.g.,* cattle ranchers and farmers, dairy cattle farmers, livestock farmers.
- Food manufacturing (NAICS code 311), *e.g.,* agricultural workers; farmers;

greenhouse, nursery, and floriculture workers; ranchers; pesticide applicators.

- Pesticide manufacturing (NAICS code 32532), *e.g.,* agricultural workers; commercial applicators; farmers, greenhouse, nursery, and floriculture workers; residential users.

B. What action is the agency taking?

In this order, EPA denies objections to EPA's order of March 29, 2017 (the Denial Order), in which EPA denied a 2007 petition (the Petition) from PANNA and NRDC (the Petitioners) that requested that EPA revoke all tolerances for the pesticide chlorpyrifos established under FFDCA section 408. (Ref. 1) The Petition also sought the cancellation of all chlorpyrifos pesticide product registrations under section 6 the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. 136d.

The Petition raised the following claims regarding both EPA's 2006 FIFRA reregistration decision and active registrations of chlorpyrifos in support of the request for tolerance revocations and product cancellations:

1. EPA has ignored genetic evidence of vulnerable populations.

2. EPA has needlessly delayed a decision regarding endocrine disrupting effects.

3. EPA has ignored data regarding cancer risks.

4. EPA's 2006 cumulative risk assessment (CRA) for the organophosphates misrepresented risks and failed to apply FQPA 10X safety factor. (*Note:* For convenience's sake, the legal requirements regarding the additional safety margin for infants and children in FFDCA section 408(b)(2)(C) are referred to throughout this response as the "FQPA 10X safety factor" or simply the "FQPA safety factor." Due to Congress' focus on both pre- and post-natal toxicity, EPA has interpreted this additional safety factor as pertaining to risks to infants and children that arise due to pre-natal exposure as well as to exposure during childhood years.)

5. EPA has over-relied on registrant data.

6. EPA has failed to properly address the exporting hazard in foreign countries from chlorpyrifos.

7. EPA has failed to quantitatively incorporate data demonstrating long-lasting effects from early life exposure to chlorpyrifos in children.

8. EPA has disregarded data demonstrating that there is no evidence of a safe level of exposure during pre-birth and early life stages.

9. EPA has failed to cite or quantitatively incorporate studies and clinical reports suggesting potential adverse effects below 10% cholinesterase inhibition.

10. EPA has failed to incorporate inhalation routes of exposure.

EPA's Denial Order denied the Petition in full (82 FR 16581). Prior to issuing that order, EPA provided the Petitioners with two interim responses on July 16, 2012 and July 15, 2014. The July 16, 2012 response denied claim 6 (export hazard) completely, and that portion of the response was a final agency action. The remainder of the July 16, 2012 response and the July 15, 2014 response expressed EPA's intention to deny six other petition claims (1–5 and 10). (*Note:* In the 2012 response, EPA did, however, inform Petitioners of its approval of label mitigation (in the form of rate reductions and spray drift buffers) to reduce bystander risks, including risks from inhalation exposure, which in effect partially granted Petition claim 10.) EPA made clear in both the 2012 and 2014 responses that, absent a request from Petitioners, EPA's denial of those six claims would not be made final until EPA finalized its response to the entire Petition. Petitioners made no such request, and EPA therefore finalized its response to those claims in the Denial Order.

The remaining Petition claims (7–9) all related to same issue: Whether the potential exists for chlorpyrifos to cause neurodevelopmental effects in children at exposure levels below EPA's existing regulatory standard (10% cholinesterase inhibition). Because these claims raised novel, highly complex scientific issues, EPA originally decided it would be appropriate to address these issues in connection with the registration review of chlorpyrifos under FIFRA section 3(g) and decided to expedite that review, intending to finalize it several years in advance of the October 1, 2022 registration review deadline. EPA decided as a policy matter that it would address the Petition claims raising these matters on a similar timeframe. Although EPA had expedited its registration review to address these issues, the Petitioners were not satisfied with EPA's progress in responding to the Petition, and they brought legal action in the Ninth Circuit Court of Appeals to compel EPA to either issue an order denying the Petition or to grant the Petition by initiating the tolerance revocation process. Following several rounds of litigation (see discussion of the litigation in Unit III. of this Order), EPA was ordered by the Ninth Circuit to issue either a tolerance revocation rule or an order denying the Petition by March 31, 2017. *In re Pesticide Action Network of North America* v. *EPA,* 840 F.3d (9th Cir. 2016). Accordingly, in compliance with the court's order, the Denial Order also finalized EPA's response on claims 7–9. As to those claims, EPA concluded that, despite several years of study, the science addressing neurodevelopmental effects remains unresolved and that further evaluation of the science during the remaining time for completion of registration review was warranted regarding whether the potential exists for adverse neurodevelopmental effects to occur from current human exposures to chlorpyrifos. EPA therefore denied the remaining Petition claims, concluding that it was not required to complete—and would not complete—the human health portion of the registration review or any associated tolerance revocation of chlorpyrifos without resolution of those issues during the ongoing FIFRA registration review of chlorpyrifos.

In June 2017, several public interest groups and states filed objections to the Denial Order pursuant to the procedures in FFDCA section 408(g)(2). Specifically, Earthjustice submitted objections on behalf of the following 12 public interest groups: Petitioners PANNA and NRDC, United Farm Workers, California Rural Legal Assistance Foundation, Farmworker Association of Florida, Farmworker Justice, GreenLatinos, Labor Council for Latin American Advancement, League of United Latin American Citizens, Learning Disabilities Association of America, National Hispanic Medical Association and Pineros y Campesinos Unidos del Noroeste. Another public interest group, the North Coast River Alliance, submitted separate objections. With respect to the states, New York, Washington, California, Massachusetts, Maine, Maryland, and Vermont submitted a joint set of objections (Ref. 2).

The objections focus on three main topics: (1) The Objectors assert that the FFDCA requires EPA apply to the FFDCA safety standard in reviewing any petition to revoke tolerances and that EPA's decision to deny the Petition failed to apply that standard; (2) The Objectors contend that the record before EPA demonstrates that chlorpyrifos results in unsafe drinking water exposures and adverse neurodevelopmental effects and that EPA must therefore issue a final rule revoking all chlorpyrifos tolerances; and (3) The Objectors claim that EPA committed procedural error in failing to respond to comments, and they specifically point to comments related to neurodevelopmental effects, inhalation risk, and Dow AgroSciences'

physiologically based pharmacokinetic model (PBPK model) used in EPA's risk assessment. Dow AgroSciences, which is now Corteva AgriScience, will be referred to as Corteva throughout the remainder of this Order.

On June 5, 2017, the same the day the Objectors were required to submit their objections to EPA, the League of United Latin American Citizens (LULAC) and the other 11 public interest Objectors represented by Earthjustice filed suit in the U.S. Court of Appeals for the 9th Circuit directly challenging the Denial Order, asserting that the court could review the order directly, even in the absence of EPA's final order under FFDCA section 408(g)(2)(C) responding to the objections they had just submitted. *LULAC, et al.* v. *Wheeler, et al.*, No. 17–71636. In their pleadings, Petitioners alternatively asked the court to issue a mandamus order compelling EPA to respond to the June 2017 objections within 60 days. On August 9, 2018, a three-judge panel of the 9th Circuit vacated the Denial Order and ordered EPA to revoke all chlorpyrifos tolerances and cancel all chlorpyrifos registrations within 60 days. *Id.*, 899 F.3d 814. EPA sought rehearing of that decision before an *en banc* panel of the 9th Circuit, a request that was granted on February 6, 2019, effectively vacating the August 9, 2018 panel decision. On April 19, 2019, the *en banc* panel granted the request for mandamus and directed EPA to respond to the objections not later than 90 days from that date. The court did not otherwise address the claims in the case.

After reviewing the objections, EPA has determined that the objections related to Petition claims regarding neurodevelopmental toxicity must be denied because the objections and the underlying Petition are not supported by valid, complete, and reliable evidence sufficient to meet the Petitioners' burden under the FFDCA, as set forth in EPA's implementing regulations. Further, for reasons stated in the Denial Order, EPA has concluded that it is also appropriate to deny the objections related to new issues raised after EPA's 2006 tolerance reassessment and reregistration of chlorpyrifos. These issues are being addressed according to the schedule for EPA's ongoing registration review of chlorpyrifos. EPA is also denying all claims related to drinking water risk and the use of the Corteva PBPK model in EPA's 2014 risk assessment and 2015 proposed rule because these claims were not made in the Petition and the objections process cannot be used to raise new issues and restart the petition process. Finally, EPA is denying the objections claiming procedural error, as EPA is not required to respond to comments made during the rulemaking process in this adjudication denying petition objections. Any response to comments will be completed in connection with EPA's final action in registration review.

C. What is the Agency's authority for taking this action?

The procedure for filing objections to EPA's final rule or order issued under FFDCA section 408(d) and EPA's authority for acting on such objections is contained in FFDCA section 408(g) (21 U.S.C. 346a(g)) and EPA's regulations at 40 CFR part 178.

II. Statutory and Regulatory Background

In this unit, EPA provides background on the relevant statutes and regulations governing the objections as well as on pertinent Agency policies and practices.

A. FFDCA and FIFRA Standards

EPA establishes maximum residue limits, or "tolerances," for pesticide residues in food and feed commodities under FFDCA section 408. Without a tolerance or an exemption from the requirement of a tolerance, food containing a pesticide residue is "adulterated" under FFDCA section 402 and may not be legally moved in interstate commerce. FFDCA section 408 was substantially rewritten by the Food Quality Protection Act of 1996 (FQPA) (Pub. L. 104– 170, 110 Stat. 1489 (1996)), which established a detailed safety standard for pesticides and integrated EPA's regulation of pesticide food residues under the FFDCA with EPA's registration and re-evaluation of pesticides under FIFRA. The standard to establish, leave in effect, modify, or revoke a tolerance is stated in FFDCA section 408(b)(2)(A)(i). "The Administrator may establish or leave in effect a tolerance for a pesticide chemical residue in or on a food only if the Administrator determines that the tolerance is safe." *Id.* "The Administrator shall modify or revoke a tolerance if the Administrator determines it is not safe." *Id.* "Safe" is defined by FFDCA section 408(b)(2)(A)(ii) to mean that "there is a reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures for which there is reliable information." Among the factors that must be addressed in making a safety determination, FFDCA section 408(b)(2)(D) directs EPA to consider "validity, completeness, and reliability of the available data from studies of the pesticide chemical and pesticide chemical residue."

Risks to infants and children are given special consideration. Specifically, FFDCA section 408(b)(2)(C)(i)(II) requires that EPA assess the risk of pesticides based on "available information concerning the special susceptibility of infants and children to the pesticide chemical residues, including neurological differences between infants and children and adults, and effects of *in utero* exposure to pesticide chemicals . . . ." (21 U.S.C. 346a(b)(2)(C)(i)(II)). This provision also creates a presumption that EPA will use an additional safety factor for the protection of infants and children. Specifically, it directs that "[i]n the case of threshold effects, . . . an additional tenfold margin of safety for the pesticide chemical residue and other sources of exposure shall be applied for infants and children to take into account potential pre- and post-natal toxicity and completeness of the data with respect to exposure and toxicity to infants and children." (21 U.S.C. 346a(b)(2)(C)). EPA is permitted to "use a different margin of safety for the pesticide chemical residue only if, on the basis of reliable data, such margin will be safe for infants and children." *Id.*

While the FFDCA authorizes the establishment of legal limits for pesticide residues in food, FIFRA section 3(a) requires the approval of pesticides prior to their sale and distribution and establishes a registration regime for regulating the use of pesticides. FIFRA regulates pesticide use in conjunction with its registration scheme by requiring EPA review and approval of pesticide labels and specifying that use of a pesticide inconsistent with its label is a violation of federal law. In the FQPA, Congress integrated action under the two statutes by requiring that the safety standard under the FFDCA be used as a criterion in FIFRA registration actions for pesticide uses that result in residues in or on food, (*see* FIFRA section 2(bb)), and directing that EPA coordinate, to the extent practicable, revocations of tolerances with pesticide cancellations under FIFRA. (*see* FFDCA section 408(l)(1)). FIFRA section 4 directed EPA to determine whether pesticides first registered prior to 1984 should be reregistered, including whether any associated FFDCA tolerances are safe and should be left in effect (*see* FIFRA section 4(g)(2)(E)). FFDCA section 408(q) directed EPA to complete that tolerance reassessment (which included the reassessment of all chlorpyrifos tolerances) by 2006. Following the

completion of FIFRA reregistration and tolerance reassessment, FIFRA section 3(g) requires EPA to re-evaluate pesticides under the FIFRA standard—which includes a determination whether to leave in effect existing FFDCA tolerances—every 15 years under a program known as "registration review." The deadline for completing the current registration review for chlorpyrifos is October 1, 2022.

B. Procedures for Establishing, Modifying, or Revoking Tolerances

Tolerances are established, modified, or revoked by rulemaking under the unique procedural framework set forth in the FFDCA. Generally, a tolerance rulemaking is initiated by the party seeking to establish, modify, or revoke a tolerance by means of filing a petition with EPA. (*See* FFDCA section 408(d)(1)). EPA publishes in the **Federal Register** a notice of the petition filing and requests public comment. After reviewing the petition and submitted comments, FFDCA section 408(d)(4) provides that EPA may issue a final rule establishing, modifying, or revoking the tolerance; issue a proposed rule to do the same; or issue an order denying the petition.

Once EPA takes action granting or denying the petition, FFDCA section 408(g)(2) allows any party to file objections with EPA and seek an evidentiary hearing on those objections. Objections and hearing requests must be filed within 60 days after the date on which EPA issues its rule or order under FFDCA section 408(d). A party may not raise issues in objections unless they were part of the petition and an objecting party must state objections to the EPA decision and not just repeat the allegations in its petition. *Corn Growers* v. *EPA*, 613 F.3d 266 (D.C. Cir. 2010), cert. denied, 131 S. Ct. 2931 (2011). EPA's final order on the objections, issued under FFDCA section 408(g)(2)(C), is subject to judicial review. (21 U.S.C. 346a(h)(1)).

III. Chlorpyrifos Regulatory Background

Chlorpyrifos (0,0-diethyl-0–3,5,6-trichloro-2-pyridyl phosphorothioate) is a broad-spectrum, chlorinated organophosphate (OP) insecticide that has been registered for use in the United States since 1965. By pounds of active ingredient, it is the most widely used conventional insecticide in the country. Currently registered use sites include a large variety of food crops (*e.g.*, tree fruits and nuts; many types of small fruits and vegetables, including vegetable seed treatments; grain/oilseed crops; cotton), and non-food use settings (*e.g.*, ornamental and agricultural seed production; non-residential turf; industrial sites/rights of way; greenhouse and nursery production; sod farms; pulpwood production; public health; and wood protection). For some of these crops, chlorpyrifos is currently the only cost-effective choice for control of certain insect pests. In 2000, the chlorpyrifos registrants reached an agreement with EPA to voluntarily cancel all residential use products except those registered for ant and roach baits in child-resistant packaging and fire ant mound treatments (*e.g.*, 65 FR 76233 (Dec. 6, 2000); 66 FR 47481 (Sept. 12, 2001).

The OPs are a group of closely related pesticides that affect functioning of the nervous system. The OPs were included in the Agency's first priority group of pesticides to be reviewed under FQPA. In 2006, EPA completed FIFRA section 4 reregistration and FFDCA tolerance reassessment for chlorpyrifos and the OP class of pesticides and determined those tolerances were safe and should be left in effect (Ref. 3). Having completed reregistration and tolerance reassessment, EPA is required to complete the next re-evaluation of chlorpyrifos under the FIFRA section 3(g) registration review program by October 1, 2022. Given ongoing scientific developments in the study of the OPs generally, in March 2009 EPA announced its decision to prioritize the FIFRA section 3(g) registration review of chlorpyrifos by opening a public docket and releasing a preliminary work plan to complete the chlorpyrifos registration review by 2015—7 years in advance of the date required by law.

The registration review of chlorpyrifos has proven to be far more complex than originally anticipated. The OPs presented EPA with numerous novel scientific issues that the agency has taken to multiple FIFRA Scientific Advisory Panel (SAP) meetings since the completion of reregistration in 2006. (*Note:* The SAP is a federal advisory committee created by FIFRA section 25(d) and serves as EPA's primary source of peer review for significant regulatory and policy matters involving pesticides.) Many of these complex scientific issues formed the basis of the 2007 petition filed by PANNA and NRDC, specifically issues related to potential human health risks associated with volatilization and neurodevelopmental effects. During the registration review process, EPA reviews the currently available body of scientific data, including animal and epidemiology data, and the assessment of potential risks from various routes of exposure. Therefore, when EPA began the registration review for chlorpyrifos in March 2009, the Agency indicated that the Agency had decided to address the Petition on a similar timeframe to EPA's expedited registration review schedule.

Although EPA has expedited the chlorpyrifos registration review to address the novel scientific issues raised by the Petition in advance of the statutory deadline, the complexity of the issues has precluded EPA from finishing this review according to the Agency's original timeframe. The Petitioners were dissatisfied with the pace of EPA's response efforts and sued EPA in federal court on three separate occasions to compel a faster response to the Petition. As explained in Unit I. of this Order, EPA addressed 7 of the 10 claims asserted in the Petition by either denying the claim, issuing a preliminary denial or approving label mitigation to address the claims, but notwithstanding these efforts, on August 10, 2015, the court issued a mandamus order directing EPA to "issue either a proposed or final revocation rule or a full and final response to the administrative Petition by October 31, 2015." *In re Pesticide Action Network of North America* v. *EPA*, 798 F.3d (9th Cir. 2015).

In response to that order, EPA issued a proposed rule to revoke all chlorpyrifos tolerances on October 30, 2015 (published in the **Federal Register** on November 6, 2015 (80 FR 69080)), based on its unfinished registration review risk assessment. EPA acknowledged it had insufficient time to complete its drinking water assessment and its review of data addressing the potential for neurodevelopmental effects.

On December 10, 2015, the Ninth Circuit issued a further order requiring EPA to complete any final rule (or petition denial) and fully respond to the Petition by December 30, 2016. On June 30, 2016, EPA sought a six-month extension to that deadline in order to allow EPA to fully consider the most recent views of the FIFRA SAP with respect to chlorpyrifos toxicology. The FIFRA SAP report was finalized and made available for EPA consideration on July 20, 2016 (Ref. 4). On August 12, 2016, the court rejected EPA's request for an extension and ordered EPA to complete its final action by March 31, 2017 (effectively granting EPA a three-month extension). On November 17, 2016, EPA published a notice of data availability (NODA) seeking public comment on both EPA's revised risk and water assessments and reopening the comment period on the proposal to revoke all chlorpyrifos tolerances (81 FR

81049). The comment period for the NODA closed on January 17, 2017.

Following the close of the comment period on the NODA, EPA issued the Denial Order on March 29, 2017, as described in Unit I. of this Order. As noted, in June 2017, EPA received objections to the Denial Order from both public interest groups and states, and some of those same organizations simultaneously filed suit in the Ninth Circuit seeking to challenge the Denial Order in advance of EPA's response to the submitted objections. That litigation is summarized in Unit I. of this Order.

IV. The Petition and EPA's Petition Response

As explained in Unit I. of this Order, PANNA and NRDC submitted the Petition in 2007, raising 10 claims in support of their request that EPA revoke all chlorpyrifos tolerances under the FFDCA and cancel all chlorpyrifos registrations under FIFRA. EPA's Denial Order denied the Petition in full. The following is a summary of EPA's response in the Denial Order to the 10 Petition claims.

A. Claim 1: Genetic Evidence of Vulnerable Populations

The Petitioners claimed that as part of EPA's 2006 reregistration and tolerance reassessment decision the Agency failed to calculate an appropriate intra-species uncertainty factor (*i.e.*, within human variability) for chlorpyrifos in both its aggregate and cumulative risk assessments (CRA). They asserted that certain data (the "Furlong study") addressing intra-species variability in the behavior of the detoxifying enzyme paraoxonase (PON1), indicates that the Agency should have applied an intra-species safety factor "of at least 150X in the aggregate and cumulative assessments" rather than the 10X factor EPA applied.

In the Denial Order, EPA explained that it carefully considered the issue of PON1 variability and determined that data addressing PON1 in isolation are not appropriate for use alone in deriving an intra-species uncertainty factor and that the issue is more appropriately handled using a PBPK model. Further, the derivation of an intra-species factor of over 150X advocated by the Petitioners is based on combining values from humanized mice with human measured values with a range from highest to lowest; the Furlong study derivation is inappropriate and inconsistent with international risk assessment practice. In addition, the 2008 FIFRA SAP did not support the PON1 data used in isolation. Finally, Petitioners' statement that the Furlong study supports an intra-species uncertainty factor of at least 150X likely overstates potential variability. EPA therefore denied this aspect of the Petition.

B. Claim 2: Endocrine Disrupting Effects

Petitioners summarized a number of studies evaluating the effects of chlorpyrifos on the endocrine system, asserting that, taken together, the studies "suggest that chlorpyrifos may be an endocrine disrupting chemical, capable of interfering with multiple hormones controlling reproduction and neurodevelopment."

EPA denied this claim because the Petition did not explain whether and how endocrine effects should form the basis of a decision to revoke tolerances. The basis for seeking revocation of a tolerance is a showing that the pesticide is not "safe." Petitioners neither asserted that EPA should revoke tolerances because effects on the endocrine system render the tolerances unsafe, nor did Petitioners submit a factual analysis demonstrating that aggregate exposure to chlorpyrifos presents an unsafe risk to humans based on effects on the endocrine system.

EPA noted that while the cited studies provide qualitative information that exposure to chlorpyrifos may be associated with effects on the androgen and thyroid hormonal pathways, these data alone do not demonstrate that current human exposures from existing tolerances are unsafe. Further, EPA explained that in June 2015, it completed an Endocrine Disruption Screening Program weight-of-evidence conclusion for chlorpyrifos. That analysis evaluated all observed effects induced, the magnitude and pattern of responses observed across studies, taxa, and sexes, and the Agency also considered the conditions under which effects occurred, in particular whether or not endocrine-related responses occurred at dose(s) that also resulted in general systemic or overt toxicity. The Agency concluded that, based on weight-of-evidence considerations, further testing was not recommended for chlorpyrifos since there was no evidence of potential interaction with the estrogen, androgen, and thyroid pathways.

C. Claim 3: Cancer Risks

Petitioners claim that the Agency "ignored" a December 2004 National Institutes of Health Agricultural Health Study showing that the incidence of lung cancer has a statistically significant association with chlorpyrifos exposure. Petitioners did not otherwise explain whether and how these data support the revocation of tolerances or the cancellation of pesticide registrations. Specifically, Petitioners did not present any fact-based argument demonstrating that aggregate exposure to chlorpyrifos poses an unsafe carcinogenic risk. Accordingly, EPA denied the Petition to revoke chlorpyrifos tolerances or cancel chlorpyrifos registrations to the extent the Petition relies on claims pertaining to carcinogenicity. EPA went on to note, however, that while there is initial suggestive epidemiological evidence of an association between chlorpyrifos and lung cancer, it is reasonable to conclude chlorpyrifos is not a carcinogen in view of the lack of carcinogenicity in the rodent bioassays and the lack of a genotoxic or mutagenic potential.

D. Claim 4: CRA Misrepresents Risks, Failed To Apply FQPA 10X Safety Factor

Petitioners asserted that EPA relied on limited data and inaccurate interpretations of a specific study (the "Zheng study") to support its decision to remove the FQPA safety factor in the 2006 OP cumulative risk assessment (CRA). Petitioners claimed the Zheng study showed an obvious difference between juvenile and adult responses to chlorpyrifos that supported retention of the 10X safety factor for chlorpyrifos in the CRA. EPA concluded that Petitioners' assertions did not provide a sufficient basis for revoking chlorpyrifos tolerances. The Petitioners' claim that the data EPA relied upon support a different FQPA safety factor for chlorpyrifos in the CRA did not amount to a showing that chlorpyrifos tolerances are unsafe as Petitioners did not present a factual analysis demonstrating that the lack of a 10X safety factor in the CRA for chlorpyrifos poses unsafe cumulative exposures to the OPs. For this reason, EPA denied the Petitioners' request to revoke chlorpyrifos tolerances or cancel chlorpyrifos registrations on the basis of the FQPA safety factor in the CRA.

Despite the inadequacy of Petitioners' FQPA CRA safety factor claims, EPA nonetheless examined the evidence Petitioners cited regarding the Zheng study. EPA acknowledged that in that study, pups appeared to be more sensitive than adults at the tested high dose. However, at the low-dose end of the response curve, relevant for human exposures, little to no difference was observed. This result is consistent with a comparative cholinesterase study submitted by Corteva that specifically compared the dose-response relationship in juvenile and adult rats and found no basis for concluding that juveniles are more sensitive, further

supporting EPA's use of an FQPA safety factor of 1X for the AChE inhibition endpoint used in the 2006 OP CRA.

E. Claim 5: Over-Reliance on Registrant Data

Petitioners asserted that in reregistering chlorpyrifos EPA "cherry picked" data, "ignoring robust, peer-reviewed data in favor of weak, industry-sponsored data to determine that chlorpyrifos could be re-registered and food tolerances be retained." As such, Petitioners argued that the Agency's reassessment decision is not scientifically defensible. EPA concluded that this Petition claim was not purported to be an independent basis for revoking chlorpyrifos tolerances or cancelling chlorpyrifos registrations but simply support for Petitioners' arguments in other parts of the Petition. While Petitioners claim that EPA ignored robust, peer-reviewed data in favor of weak, industry-sponsored data for the reregistration of chlorpyrifos, Petitioners did not cite to any studies other than those used to support their other claims. In general, Petitioners did not provide any studies in the Petition that EPA failed to evaluate. Since the specific studies cited by Petitioners were not associated with this claim, but rather their other claims, EPA's response to the specific studies were, therefore, addressed in its responses to Petitioners' other claims. EPA went on to explain, however, that the Agency does not ignore robust, peer-reviewed data in favor of industry-sponsored data and that EPA has a public and well-documented set of procedures that it applies to the use and significance of all data utilized to inform risk management decisions. EPA does rely on registrant-generated data submitted in response to FIFRA and FFDCA requirements, as these data are conducted and evaluated in accordance with a series of internationally harmonized and scientifically peer-reviewed study protocols designed to maintain a high standard of scientific quality and reproducibility. But EPA does not end its review there. To further inform the Agency's risk assessment, EPA is committed to the consideration of other sources of information such as data identified in the open, peer-reviewed literature and information submitted by the public as part of the regulatory evaluation of a pesticide.

F. Claim 6: EPA Failed to Properly Address the Exporting Hazard in Foreign Countries From Chlorpyrifos

In the July 16, 2012 interim Petition response, EPA issued a final denial of this claim, as it was not a claim subject to the FFDCA, which provides for an administrative objections process following the denial of a petition. EPA explained in the interim response that it lacked authority to address the risks chlorpyrifos may pose to workers in foreign countries who may not utilize worker protection equipment that the United States requires. Further, EPA noted that it has no authority to ban the export of pesticides to foreign countries regardless of whether those pesticides may be lawfully used in the United States. Accordingly, EPA denied this claim, and that denial constituted final agency action.

G. Claims 7–9: EPA Failed to Quantitatively Incorporate Data Demonstrating Long-Lasting Effects From Early Life Exposure to Chlorpyrifos in Children; EPA Disregarded Data Demonstrating That There Is no Evidence of a Safe Level of Exposure During Pre-Birth and Early Life Stages; and EPA Failed To Cite or Quantitatively Incorporate Studies and Clinical Reports Suggesting Potential Adverse Effects Below 10% Cholinesterase Inhibition.

The Petitioners asserted that human epidemiology and rodent developmental neurotoxicity data suggest that pre-natal and early life exposure to chlorpyrifos can result in long-lasting, possibly permanent damage to the nervous system and that these effects are likely occurring at exposure levels below 10% cholinesterase inhibition, EPA's existing regulatory standard for chlorpyrifos and other OPs. They assert that EPA has therefore used the wrong endpoint as a basis for regulation and that, taking into account the full spectrum of toxicity, chlorpyrifos does not meet the FFDCA safety standard or the FIFRA standard for registration.

EPA grouped these claims together because they fundamentally all raised the same issue: Whether the potential exists for chlorpyrifos to cause neurodevelopmental effects in infants and children from exposures (either to mothers during pregnancy or directly to infants and children) that are lower than those resulting in 10% cholinesterase inhibition—the basis for EPA's long-standing point of departure (POD) in regulating chlorpyrifos and other OPs. EPA noted that these claims were not challenges to EPA's 2006 reregistration decision for chlorpyrifos, but rather, new challenges to EPA's ongoing approval of chlorpyrifos under FIFRA and the FFDCA because they rely in large measure on data published after EPA completed both its 2001 chlorpyrifos Interim Reregistration Decision and the 2006 OP CRA that concluded the reregistration process for chlorpyrifos and all other OPs. As matters that largely came to light after the completion of reregistration, EPA made clear that these Petition issues are being addressed as part of the registration review of chlorpyrifos—the next round of re-evaluation under FIFRA section 3(g). The Denial Order noted that the question of OP neurodevelopmental toxicity was, and remains, an issue at the cutting edge of science, involving significant uncertainties.

During registration review, EPA conducted an in-depth analysis of the available OP and chlorpyrifos biomonitoring data and of the available epidemiologic studies from three major children's health cohort studies in the U.S., specifically from the Columbia Center for Children's Environmental Health (CCCEH), Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS), and Mt. Sinai. EPA three times, in 2008, 2012, and 2016 has presented approaches and proposals to the FIFRA SAP for evaluating this epidemiologic data exploring the possible connection between *in utero* and early childhood exposure to chlorpyrifos and adverse neurodevelopmental effects. The SAP's reports have rendered numerous recommendations for additional study and sometimes conflicting advice for how EPA should consider (or not consider) the epidemiology data in conducting EPA's registration review human health risk assessment for chlorpyrifos and served to underscore that the science on this question is not resolved and would benefit from additional inquiry. Indeed, EPA explained in the Denial Order that the comments received by EPA indicate that there are considerable areas of uncertainty with regard to what the epidemiology data show and deep disagreement over how those data should be considered in EPA's risk assessment. In August 2016, the Ninth Circuit made clear, however, that EPA was to provide a final response to the Petition by March 31, 2017, and that no more extensions would be granted—regardless of whether the science remains unsettled and irrespective of whatever options may exist for resolution of these issues during the registration review process.

While EPA acknowledged its obligation to respond to the Petition as required by the court, EPA noted that the court's order did not and could not compel EPA to complete the registration review of chlorpyrifos and the issues required for that determination in advance of the October 1, 2022 deadline

provided in FIFRA section 3(g), 7 U.S.C. 136a(g). Although past EPA Administrators had proposed to attempt to complete that review several years in advance of the statutory deadline (and respond to the Petition on the same time frame), it was not possible to fully address these registration issues earlier than the registration review period. As a result, EPA concluded that it needed to adjust the schedule for chlorpyrifos so that it could complete its review of the science addressing neurodevelopmental effects prior to making a final registration review decision whether to retain, limit, or remove chlorpyrifos from the market. Accordingly, EPA denied the Petition claims and stated its intention to complete a full and appropriate review of the neurodevelopmental data before either finalizing the proposed rule of October 30, 2015, or taking an alternative regulatory path.

EPA explained that that denial of the Petition on these grounds provided was consistent with governing law because the petition provision in FFDCA section 408(d) does not address the timing for responding to a petition, nor does it limit the extent to which EPA may coordinate or stage its petition responses with the registration review provisions of FIFRA section 3(g). Provided EPA completes registration review by October 1, 2022, Congress otherwise gave the EPA Administrator the discretion under FIFRA to determine the schedule and timing for completing the review of the over 1000 pesticide active ingredients currently subject to evaluation under FIFRA section 3(g). EPA may lawfully re-prioritize the registration review schedule developed by earlier administrations provided that decision is consistent with law and an appropriate exercise of discretion. *See Federal Communications Commission* v. *Fox Television Stations,* 129 S.Ct. 1800 (2009) (Administrative Procedure Act does not require that a policy change be justified by reasons more substantial than those required to adopt a policy in the first instance). Nothing in FIFRA section 3(g) precludes EPA from altering a previously established registration review schedule. Given the absence of a clear statutory directive, FIFRA and the FFDCA provide EPA with discretion to take into account EPA's registration review of a pesticide in determining how and when the Agency responds to FFDCA petitions to revoke tolerances. As outlined previously, given the importance of this matter and the fact that critical questions remained regarding the significance of the data addressing neurodevelopmental effects, EPA asserted that there is good reason to extend the registration review of chlorpyrifos and therefore to deny the Petition. To find otherwise would effectively give petitioners under the FFDCA the authority to re-order scheduling decisions regarding the FIFRA registration review process that Congress has vested in the Administrator.

H. Claim 10: Inhalation Exposure From Volatilization

Petitioners assert that when EPA completed its 2006 OP CRA, EPA failed to consider and incorporate significant exposures to chlorpyrifos-contaminated air that exist for some populations in communities where chlorpyrifos is applied. Petitioners assert that these exposures exceeded safe levels when considering cholinesterase inhibition as a POD and that developmental neurotoxicity may occur at even lower exposure levels than those resulting in cholinesterase inhibition.

To the extent Petitioners are asserting that human exposure to chlorpyrifos spray drift and volatilized chlorpyrifos present neurodevelopmental risks for infants and children, EPA denied this claim for the reasons stated in EPA's response to claims 7–9.

With respect to Petitioners' claim that exposures to spray drift and volatilized chlorpyrifos present a risk from cholinesterase inhibition, EPA denied the Petition for the reasons identified in EPA's Spray Drift Mitigation Decision of July 16, 2012, and EPA's interim response of July 15, 2014, addressing chlorpyrifos volatilization. Specifically, in the Spray Drift Mitigation Decision, EPA determined that the chlorpyrifos registrants' adoption of label mitigation (in the form of label use rate reductions and no-spray buffer zones) eliminated risk from cholinesterase inhibition as a result of spray drift. As for risks presented by volatilized chlorpyrifos that may occur following application, EPA's July 15, 2014 interim response to the Petition explained that vapor-phase inhalation studies for both chlorpyrifos and chlorpyrifos-oxon made clear that neither vapor-phase chlorpyrifos nor chlorpyrifos oxon presents a risk of cholinesterase inhibition.

V. Objections

The three separate sets of objections to the Denial Order filed with EPA in June 2017 raise similar concerns and can be reduced to the following three primary arguments:

- The Objectors argue that EPA's Denial Order applied the wrong legal standard. (Note: All persons filing objections will be referred to as "Objectors.") They assert that neither "scientific uncertainty" nor the October 2022 deadline for registration review under FIFRA section 3(g), nor the widespread agricultural use of chlorpyrifos, provide a basis for denying petitions to revoke. They claim that EPA has unlawfully left chlorpyrifos tolerances in place without making the safety finding required by the FFDCA.
- The Objectors assert that EPA has previously found that chlorpyrifos tolerances are unsafe and has not disavowed those findings. Specifically, they claim that EPA has found that chlorpyrifos results in unsafe drinking water exposures and results in adverse neurodevelopmental effects to children and that EPA must therefore revoke the tolerances.
- The Objectors argue that EPA's Denial Order committed a procedural error by failing to address significant concerns raised in the comments on EPA's 2014 risk assessment and 2015 proposed revocation that EPA's assessment fails to protect children. In particular, the Objectors focus on concerns raised in comments asserting that (1) EPA's use of 10% cholinesterase as a regulatory standard is not protective for effects to children's developing brains; (2) EPA has not properly accounted for effects from inhalation of chlorpyrifos from spray drift and volatilization; and (3) EPA inappropriately used the Corteva PBPK model to reduce inter- and intra-species safety factors because the model is ethically and scientifically deficient.

VI. Corteva's Comments on the Objections

Corteva, the primary registrant of chlorpyrifos products registered for use in agriculture, submitted a response to the objections on August 27, 2018, raising specific detailed scientific concerns with the objections (Ref. 4). In addition, Corteva states that there is nothing in the FFDCA suggesting that statute requires EPA to make a safety finding in order to deny a response to a petition and that the FFDCA's implementing regulations place the burden on a petitioner to prove that a pesticide is unsafe. Corteva argues that to find otherwise would lead to the result that EPA is required to renew its safety finding every time a petition is filed, irrespective of the strength and quality of the evidence cited and regardless of whether EPA is engaged in an ongoing scientific review of issues addressed in the petition through FIFRA registration review.

VII. EPA's Response to Objections

EPA's responses to the specific objections summarized in Unit V. are provided in this unit.

A. Claims Regarding the Legal Standard for Reviewing Petitions To Revoke

Before addressing the specific legal objections, EPA notes that the Objectors' concerns focus primarily on EPA's denial of Petition claims 7–10 as they relate to the potential for adverse neurodevelopmental effects to children from exposure to chlorpyrifos in food, drinking water, and from spray drift. These concerns fundamentally relate to issues EPA is evaluating in its current registration review of chlorpyrifos. EPA is in the process of completing revised risk assessments to address new data and advancements in risk assessment methodology since EPA's 2006 safety finding for chlorpyrifos as part of FIFRA section 4 reregistration and FFDCA section 408(q) tolerance reassessment to review tolerances for pesticide residues in effect (Ref. 3). The Objectors have not materially challenged EPA's denial of Petition claims that related to matters before EPA at the time of EPA's 2006 safety finding. Specifically, they have not raised objections to the denial of claims relating to the genetic evidence for human vulnerability with respect to the detoxifying enzyme paraoxonase, endocrine-related effects, or carcinogenicity (claims 1–3). Nor have Objectors challenged most aspects of EPA's conclusions in the Denial Order respecting the potential for current chlorpyrifos exposures to result in acetyl cholinesterase inhibition—the regulatory POD used in EPA's 2006 reregistration and tolerance reassessment decisions.

In sum, the objections are focused on EPA's ongoing work in FIFRA registration review to evaluate more recent information addressing the risk of adverse neurodevelopmental effects. With respect to these claims, EPA has concluded, after many years of attempting to obtain information necessary to validate this information, that the objections and the underlying petition fail to provide evidence of neurodevelopmental effects that is sufficiently valid, complete, and reliable at this time to meet the burden petitioners for revocation bear in presenting a case that tolerances are unsafe, pursuant to the standard under FFDCA section 408(b)(2). In addition, as provided in the Denial Order, EPA has concluded that it is also appropriate to deny the petition to allow EPA to complete its assessment of the potential for adverse neurodevelopmental outcomes in connection with the ongoing chlorpyrifos FIFRA registration review.

1. *Burden of coming forward with valid, complete, and reliable evidence.* In response to the Objectors' claims that EPA applied an incorrect legal standard in denying the Petition, EPA disagrees that the FFDCA requires EPA to make a new safety determination in response to every petition to revoke under FFDCA section 408(d) or that it must revoke tolerances in the absence of making a renewed safety determination in response to a petition. Petitioners cite the FFDCA safety definition and the findings EPA must make to establish a tolerance or leave a tolerance in effect when reassessing the safety of tolerance under FFDCA section 408(q) and FIFRA section 3(g). None of their arguments, however, specifically focus on the FFDCA section 408(d) petition process to modify or revoke a tolerance and EPA's implementing procedural regulations that require persons seeking tolerance revocation to come forward with evidence sufficient to support a finding that the applicable safety standard has not been met. In other words, even if one were to assume, *arguendo,* that the same safety standard applies to EPA action on a petition to revoke a tolerance as applies to the Agency's initial establishment of a tolerance, that is a separate issue from the evidentiary burden a petitioner must meet to support its position. As explained in this unit, in this case, EPA reasonably construes the FFDCA and the Agency's implementing regulations to require petitioners seeking withdrawal of a tolerance to support this request with valid, complete and reliable data that set forth why the tolerances are unsafe, a burden Petitioners here have failed to meet.

By way of background, it is important to note that while Congress addressed the requirements for petitions to establish a tolerance with considerable specificity, *see* FFDCA section 408(d)(2)(A), it by contrast expressly left the specific requirements for petitions to modify or revoke a tolerance to EPA's rulemaking discretion. Id., FFDCA section 408(d)(2)(B). In turn, EPA's long-standing regulations require petitions seeking modification or revocation of a tolerance based on "new data" to furnish that data in the same form required for petitions seeking to establish tolerances, to the extent applicable. 40 CFR 180.32(b) ("New data should be furnished in the form specified in 180.7(b) [pertaining to "[p]etitions proposing tolerances"] for submitting petitions, as applicable."). Thus, Congress expressly conferred discretion on EPA to specify the requirements for withdrawal of an existing tolerance, and EPA's long-standing regulations require a petitioner seeking revocation to meet the same standard of data reliability as a petitioner seeking to establish a tolerance.

FFDCA section 408(b)(2)(D)(i) requires that all actions of the Administrator to establish, modify, leave in effect, or revoke tolerances must consider, among other factors, "the validity, completeness, and reliability of the available data from studies of the pesticide chemical and pesticide chemical residue." Consistent with this obligation, EPA regulations provide that a petitioner has a burden to provide "reasonable grounds" for revocation, including an assertion of facts to justify the modification or revocation of the tolerance (40 CFR 180.32(b)). Further, the regulations also make clear that persons seeking revocation have an initial evidentiary burden that must be met before the question of whether the applicable safety standard under FFDCA section 408(b)(2) is met is properly placed before EPA. *See* 40 CFR 179.91 (Party requesting revocation hearing has initial burden of going forward with evidence). This longstanding interpretation of the statute and the procedures Congress established is permissible and entitled to substantial deference. *Sebelius* v. *Auburn Reg'l Med. Ctr.,* 133 S. Ct. 817, 826–827 (2013) (citing *National Cable & Telecomm. Ass'n* v. *Brand X internet Servs.,* 545 U.S. 967, 980 (2005)). Notably, this regulation mirrors EPA's implementing FIFRA hearing regulations at 40 CFR 164.80(a), which likewise make clear that a person seeking cancellation or suspension must present the case that the standards for those actions have been met.

Recently, in *Ellis* v. *Housenger,* 252 F. Supp. 3d 800, 809 (N.D. Cal. 2017), the U.S. District for the Northern District of California interpreted those regulations, explaining that the FIFRA hearing regulations place the burden on the proponent of a regulatory action to present an affirmative case for action, and that initial burden is properly applied to petitions seeking immediate action. Similarly, before the question whether the applicable safety standard under FFDCA section 408(b)(2) is met is properly placed before the EPA, petitioners must first meet their burden of coming forward with sufficient evidence to show that pesticide tolerances to be modified or revoked are not safe.

EPA concludes that Petitioners have not met that burden. Petitioners have

not presented evidence to establish that chlorpyrifos tolerances must be revoked because of the risk of neurodevelopmental effects at levels lower than EPA's currently regulatory standard. After several years and numerous, significant efforts to evaluate the petition claims related to neurodevelopmental toxicity, including communications with study authors and researchers in an effort to obtain underlying data and validate and replicate reported results, EPA concludes that the information yet presented by Petitioners is not sufficiently valid, complete, and reliable to support abandoning the use of AChE inhibition as the critical effect for regulatory purposes under the FFDCA section 408.

Cholinesterase inhibition and the cholinergic effects (*i.e.*, the physiological or behavioral changes) caused by organophosphorous pesticides, including chlorpyrifos, have long been the endpoints that EPA and nearly every other pesticide regulatory body in the world have used in assessing potential human health hazards. EPA has regarded data showing cholinesterase inhibition in brain, red blood cell (RBC), or plasma, and data on physiological or behavioral changes as critical effects for regulatory purposes. Guideline animal toxicity studies have historically been used in support of the 10% RBC acetylcholinesterase (AChE) inhibition point of departure (POD) for chlorpyrifos in EPA risk assessments.

EPA's 2006 Registration Eligibility Decision (RED) for chlorpyrifos relied on AChE inhibition results from laboratory animals for deriving the POD. Although not acknowledged by the Petitioners and Objectors, in conducting risk assessments in support of the chlorpyrifos RED, EPA also considered the emerging new information from laboratory studies that identified potential concern for increased sensitivity and susceptibility for the young from neurodevelopmental effects unrelated to AChE inhibition. At that time, EPA did not believe those studies support a neurodevelopmental POD for quantitative risk assessment, but it did provide the support for EPA's retention of the FQPA 10X factor in the 2001 chlorpyrifos IRED (Ref. 5).

While Petitioners and Objectors are correct that EPA did not retain the FQPA 10X for chlorpyrifos in the OPs 2006 cumulative risk assessment, that assessment dealt only with the established common mechanism of toxicity for the OPs—AChE inhibition—not with potential hazards that relate to the OPs individually. Accordingly, EPA did not reduce the 10X safety factor as it relates to chlorpyrifos specifically in its 2006 tolerance reassessment and reregistration determination that chlorpyrifos tolerances are safe. To the extent the Objectors are therefore arguing that EPA must, at a minimum, retain the FQPA 10X factor for chlorpyrifos because of the potential for neurodevelopmental effects, those objections are denied as moot. EPA's most recent assessment of the chlorpyrifos tolerances that was challenged in the Petition did retain the FQPA 10X, in part because of neurodevelopmental studies.

The Petition and the objections also argue, however, that EPA should not simply retain the FQPA 10X safety factor but should revoke chlorpyrifos tolerances because of evidence showing the potential for neurodevelopmental effects to occur well below EPA's existing regulatory standard. In sum, they believe EPA should be using the results of existing epidemiologic data to set a regulatory POD for chlorpyrifos at levels that would require EPA to revoke all chlorpyrifos tolerances.

EPA has, since the issuance of the 2006 RED, consistently concluded that the available data support a conclusion of increased sensitivity of the young to the neurotoxic effects of chlorpyrifos and for the susceptibility of the developing brain to chlorpyrifos. This conclusion comes from an evaluation across multiples lines of evidence including mechanistic studies and newer *in vivo* laboratory animal studies, but particularly with the available epidemiology reports along with feedback from the 2012 and 2016 FIFRA SAP meetings. As noted, EPA has retained the FQPA 10X safety factor on these grounds. However, EPA and the FIFRA SAP have also consistently cited the lack of robustness of these data for deriving a POD for neurodevelopmental effects given (1) the absence of a clear mechanism of action for chlorpyrifos in the developing brain; (2) the dosing regimen in *in vivo* studies that differs from internationally accepted protocols; and (3) the lack of any meaningful raw data from the epidemiologic data that are the centerpiece of this area of inquiry.

The lack of a mechanistic understanding for effects on the developing brain precludes EPA from validly or reliably assessing potential differences (and similarities) between laboratory animals and humans with respect to dose-response and temporal windows of susceptibility. In the absence of this information, EPA has no valid or reliable ways to bridge the scientific interpretation of the laboratory studies and epidemiology studies with chlorpyrifos. In addition, the dosing regimen used in the *in vivo* studies means the data are not sufficiently valid, complete and reliable for regulatory purposes given the problems they present for the quantitative interpretation and extrapolation of the results. Specifically, the *in vivo* laboratory animal studies generally use fewer days of dosing that are aimed at specific periods of rodent fetal or early post-natal development compared to internationally adopted guideline studies which are intended to cover both pre- and post-gestational periods. The degree to which these shorter dosing periods coincide with comparable windows of susceptibility in human brain development is unclear. In addition, except for some studies conducted recently, most of the *in vivo* laboratory studies use doses that are higher than doses that cause 10% RBC AChE inhibition. These studies are therefore are not useful quantitatively to evaluate whether EPA's current regulatory standard is or is not sufficient to preclude the potential for neurodevelopmental effects.

Finally, and most significantly, despite numerous requests over the last decade, the authors of the epidemiologic studies that provide potentially the most relevant information regarding effects to humans have never provided the underlying data from their studies to EPA to allow EPA and others to independently verify the validity and reliability of the results reported in their published articles. EPA believes it is necessary to first replicate the statistical analyses used in the studies to ensure their accuracy. In addition, EPA wants to examine the raw data used in the analysis to ensure appropriate handling of data points and in potentially conducting alternative statistical analyses. For example, EPA would want to evaluate the elimination of certain study participants from the CCCEH study that were deemed to be outliers in order to determine whether their exclusion was proper and how it may have affected the results. The lack of publicly available raw data does not necessarily preclude EPA from reliance on such information for the purpose of risk assessment. Given the long history and internationally harmonized use of acetylcholinesterase inhibition as the point of departure for chlorpyrifos, however, EPA reasonably requires more complete information regarding the studies in the published articles to establish a POD and that threshold has not been met in this instance. Due to these limitations, EPA does not believe the Petition, or the objections make the

case for EPA to establish a POD based on neurodevelopmental effects, which remains central to the Petitioners' claims 7–9.

EPA understands that this conclusion is at odds with its revised risk assessment that it published for comment with the NODA in November 2016. By way of explanation, EPA notes that it has undertaken considerable efforts to assess the available chlorpyrifos data, including the references cited by the Petitioners in support for their claims related to neurodevelopmental effects. Specifically, in Chapter 4 and Appendices 2–4 of the 2014 human health risk assessment, EPA provides a detailed discussion of the strengths and uncertainties associated with the epidemiology studies. For example, although the studies used US-based exposure profiles in real world situations, EPA noted that the lack of data on the timing of chlorpyrifos applications was a key concern in the exposure assessment. EPA conducted a preliminary review of available literature and research on epidemiology in mothers and children following exposures chlorpyrifos and other OPs, laboratory studies on animal behavior and cognition, AChE inhibition, and mechanisms of action, and took it to the SAP in 2008.

The CCCEH study used concentrations of pesticides (including chlorpyrifos) in umbilical cord blood as a measure of exposure, while two other birth cohorts used urinary biomarkers in the mothers to estimate pesticide exposure. In 2012, the EPA convened another meeting of the FIFRA SAP to review the latest experimental data related to AChE inhibition, cholinergic and non-cholinergic adverse outcomes, including neurodevelopmental studies on behavior and cognition effects. The EPA also performed an in-depth analysis of the available chlorpyrifos biomonitoring data and of the available epidemiologic studies from three major children's health cohort studies in the U.S., including those from the CCCEH, Mt. Sinai, and CHAMACOS. The EPA explored plausible hypotheses on mode of actions/adverse outcome pathways (MOAs/AOPs) leading to neurodevelopmental outcomes seen in the biomonitoring and epidemiology studies.

EPA convened another meeting of the FIFRA SAP in April 2016, which was unique in focus compared to the previous meetings in that EPA explicitly proposed using information directly from the CCCEH published articles for deriving the POD. The 2016 SAP did not support the "direct use" of the cord blood and working memory data for deriving the regulatory endpoint for several reasons, among them, the lack of raw data from the epidemiology study (Ref. 4).

This feedback is consistent with concerns raised in public comments EPA received on the use of the epidemiology data throughout the course of registration review from the grower community, pesticide registrants, and the U.S. Department of Agriculture. The final FIFRA SAP report provides a detailed account of the concerns associated with the Agency's April 2016 proposed approach to selecting the point of departure (POD) and its use in quantitative risk assessment. Specifically, the SAP report noted that "[t] he majority of the panel stated that using cord concentrations for derivation of the POD could not be justified by any sound scientific evaluation. The Panel was conflicted with respect to the importance of a 2% change in working memory." *Id.* at 19. The Panel went on to note that "the Agency's inability to confidently estimate previous exposure patterns and/or intensity hinders the use of cord blood at delivery as an anchor from which to extrapolate back to a more toxicologically meaningful internal exposure metric." *Id.* at 42. The SAP also noted the insufficient information about timing of chlorpyrifos applications in relation to cord blood concentrations at the time of birth, as well as uncertainties about the prenatal window(s) of exposure linked to reported effects.

EPA acknowledges that the 2012 and 2016 SAPs note effects in the epidemiology and experimental studies below 10% AChE inhibition. In addition, both the 2008 and 2012 SAP commented on the strengths of the CCCEH epidemiologic studies and the value of the information they provide. However, despite these strengths, both the 2008 and 2012 Panels recommended that AChE inhibition remain as the source of data for the PODs. The 2016 SAP expressed significant reservations about the proposed approach to use the cord blood as the source of data for the POD. It noted the incompleteness of the information, including the lack of raw data, reproducibility of analytical blood data, and knowledge about chlorpyrifos application timing relative to pregnancy. EPA has evaluated the SAP's concerns, as well as public comments received on the 2016 updated human health risk assessment echoed a number of the SAP's concern regarding use of the CCCEH study. Based on the uncertainties identified by the 2016 SAP, the published articles from CCCEH are not complete for deriving a POD. EPA acknowledges this conclusion differs from the position supported in the 2016 revised human health risk assessment, but EPA believes the shortcomings of the data identified raise issues of validity, completeness and reliability under the FFDCA that direct against using the data for risk assessment at this time. As stated in the Denial Order, EPA intends to continue its exploration of the uncertainty around using neurodevelopmental effects to establish a POD as it works to complete registration review, including renewed efforts to obtain the raw data from the epidemiologic studies that are the central to consideration of potential neurodevelopmental effects.

Notably, EPA has made requests to CCCEH, CHAMACOS, and Mt. Sinai to obtain the raw data, and visited Columbia University in an attempt to better understand their study results and what raw data exist. EPA also requested the original CCCEH study protocol to determine whether its specific questions regarding exposure timing could be addressed with the raw data. EPA was informed the CCCEH protocol was not available, and EPA did not receive the raw data from any of those research institutions. Columbia made a public commitment to "share all data gathered," however, to date, CCCEH has not provided EPA with the data, citing subject privacy concerns. In 2018, EPA explored options for blinding the data to eliminate this concern. However, through these conversations, CCCEH indicated there is no effective way to remedy this issue, citing that since the cohort is from a very small geographic area, subject identification would still be possible, and therefore, was still of concern.

In addition, EPA actively sought clarification on the kinds of residential application methods of chlorpyrifos used in New York City (NYC) during the time the CCCEH study was conducted (1998–2000) in order to provide additional context to the results of the CCCEH study conclusions. Through a series of email and telephone conversations with NYC pest control officials in 2016, EPA consistently heard that chlorpyrifos was typically applied as a crack and crevice application between 1998 and 2000. Unfortunately, EPA has no way to verify that this use pattern aligns with the exposures of participants in the CCCEH study and would not be able to corroborate the correlation between crack and crevice application and the observed neurodevelopmental effects.

As indicated, EPA has undertaken considerable efforts to assess the CCCEH

study, including submitting EPA's evaluation of the CCCEH study to multiple SAPs. Given that CCCEH has not shared the raw data or the results of their exploratory analyses, EPA cannot validate or confirm the data analysis performed, the degree to which the statistical methods employed were appropriate, or the extent to which (reasonable or minor) changes in assumptions may have changed any final results or conclusions. EPA has been unable to conduct its own evaluation of the study conclusions utilizing the raw data nor has EPA has been able to address the issues identified by the 2016 SAP. While EPA has retained the FQPA 10x safety factor in order to address this potential uncertainty, given the shortcomings to date of the published epidemiology data, EPA does not have sufficiently complete information to currently support using the epidemiology studies as the POD in place of AChE inhibition as the POD.

In conclusion, the epidemiologic studies are central to the Petitioner's claims regarding neurodevelopmental effects, yet the Petitioners and Objectors rely only on summaries in publications to present their case. Petitioners have not presented the raw data from the epidemiology studies for consideration of their claims. EPA has likewise been unable to obtain this critical information, though the FIFRA SAP and commenters have raised many questions about it. So, EPA has not been able to verify the conclusions of the epidemiology studies due to this lack of raw data. Further, the lack of a clear mechanism of action and the lack of an internationally accepted dosing regimen in the *in vivo* data also preclude EPA from determining the relevance of the limited animal data addressing the potential for neurodevelopmental effects. The Petitioners have therefore failed to meet their initial burden of providing sufficiently valid, complete, and reliable evidence that neurodevelopmental effects may be occuring at levels below EPA's current regulatory standard and no information submitted with the objections addresses this shortcoming of the Petition.

2. *Reconciling FFDCA petitions to revoke and FIFRA Registration Review.* EPA also continues to conclude that denial is appropriate for claims related to matters that are the subject of registration review, specifically for chlorpyrifos, claims related to neurodevelopmental toxicity. In this case, the data deficiencies in the Petition related to neurodevelopmental toxicity that EPA is currently studying in a more up-to-date, thorough and methodical fashion in conjunction with the statutorily prescribed FIFRA re-registration process. In this context, it is particularly appropriate for EPA to take into account the substantive work that it is conducting under FIFRA in reaching its decision on the Petition.

As EPA explained in the Denial Order, to reconcile the FFDCA petition procedures with the FIFRA registration review provisions that require EPA to conduct periodic reviews of all pesticides, EPA must be able to take account of the FIFRA registration review schedule for a pesticide in determining how and when to respond to an FFDCA petition that raises issues that are also the subject of a current registration review. As noted, the Denial Order fully responded to Petitioners' claims that address the substance of EPA's 2006 safety finding, and Petitioners and the other Objectors could have chosen to challenge and litigate that determination through the petition and judicial review provisions of the FFDCA, had they wished. The objections, however, do not for the most part go to the substance of EPA's 2006 safety finding. Those claims have largely been abandoned and instead the objections now focus only on compelling EPA to resolve on a petitioner-dictated schedule new issues regarding the potential for neurodevelopmental toxicity that are part of an ongoing evaluation in registration review in advance of the statutory deadline (October 1, 2022) provided by Congress in FIFRA section 3(g) for completing that assessment. To that end, Objectors argue that the fact Congress established a 2022 deadline for registration review is no license for EPA to delay its response to an FFDCA petition and that EPA is in fact prohibited from relying on registration review as a basis for determining how to complete other reviews of a pesticide. Specifically, they cite to language in FIFRA section 3(g)(1)(C) that states that "[n]othing in this subsection shall prohibit the Administrator from undertaking any other review of a pesticide under this chapter." Objectors have overlooked the critical language at the end of this passage ("under this chapter") that by its terms only speaks to how EPA should reconcile registration review with other reviews under FIFRA. The language does not address reviews under the FFDCA, much less prohibit EPA from reconciling its responses to FFDCA petitions with the timeframe for registration review under FIFRA. The Objectors also do not point to any language in the FFDCA prohibiting the reconciliation of a response to a petition to revoke tolerances with the registration review schedule for reviewing the pesticide—which includes a determination whether to leave existing tolerances in effect. The 15-year registration review interval reflects Congress's effort to balance the need for EPA to assure that pesticides meet the FFDCA and FIFRA standards, while at the same time recognizing that completing scientific evaluations for over 1000 active ingredients is both time-consuming and resource-intensive. During a registration review, EPA is required to "assess changes since a pesticide's last [registration] review," including new risk assessment methods, new studies and new data on pesticides. 40 CFR 155.53(a). This is precisely the assessment EPA is in the process of undertaking in the chlorpyrifos registration review with respect to the Petition claims addressing new information on the potential for adverse neurodevelopmental effects. If, as Petitioners and Objectors argue, EPA were required to truncate its ongoing registration review process to make a new FFDCA safety finding every time it received a petition to modify or revoke tolerances, petitioners would effectively have the authority to re-order the Administrator's scheduling of registration review decisions under FIFRA and dictate the extent of inquiry EPA may put to a matter before reaching a resolution. EPA continues to believe that with the passage of FIFRA section 3(g) and the 15-year review cycle created by that provision, Congress directed the Administrator, not FFDCA petitioners, to determine the appropriate timing and process for completing the review of dietary risk within that 15-year review period. EPA therefore concludes that it is also appropriate to deny the objections and the underlying petition to the extent they seek to compel EPA's consideration of neurodevelopmental toxicity issues raised during the course of the current registration review in advance of the schedule provided by Congress under FIFRA section 3(g).

As described previously, EPA has compelling reasons to follow its regulatory process through registration review. Specifically, EPA is working to update a number of assessments that will result in a more complete, accurate assessment of the risks of chlorpyrifos than if EPA were compelled to truncate that review now. The key components of EPA's updates to its analysis are (1) Review of five new laboratory animal studies for consideration in the updated human health risk assessment, and (2) Incorporating refined use information

into the 2016 updated drinking water assessment.

With respect to the animal data, in 2018, the California Department of Pesticide Regulation (CDPR) proposed to adopt a regulation designating chlorpyrifos as a toxic air contaminant (TAC) in California. As part of this determination, CDPR developed its "Final Toxic Air Contaminant Evaluation of Chlorpyrifos Risk Characterization of Spray Drift, Dietary, and Aggregate Exposures to Residential Bystanders." The CDPR risk characterization document cites five new laboratory animal studies not previously reviewed by EPA (Gomez-Gimenez et al., 2017, 2018; Silva et al., 2017; Lee et al., 2015; Carr et al., 2017). It is appropriate for EPA to review these five new studies in order to complete EPA's evaluation of potential neurodevelopmental effects. CDPR is using these studies as the main source of information for their new POD for acute oral exposure, so it is prudent for EPA to evaluate the data's quality and whether it provides the strong support for the conclusion that effects on the developing brain may occur below a dose eliciting 10% AChE inhibition that would be used to establish a new POD for the EPA's risk assessment. EPA is conducting its review in accordance with OPP's Guidance for Considering and Using Open Literature Toxicity Studies to Support Human Health Risk Assessment. It has contacted the primary investigators associated with the new animal studies in July–August 2018, and received the raw data associated with one of these studies.

As for EPA's drinking water assessment, the Agency identified certain uses, application rates, and practices described in the current chlorpyrifos labels that are not actually being used in the field and are contributing to an over-estimate of potential drinking water concentrations. EPA has requested additional information from the registrants to confirm the accuracy of these assumptions and anticipates including these updates in the Proposed Interim Decision.

To be clear, EPA remains committed to expediting its registration review determination so that it is completed well in advance of the October 2022 deadline. To that end, EPA anticipates making available any updates to the human health and drinking water assessments for public availability and comment by summer of 2020. Updates will also include EPA's response to public comments from the previous comment periods. In addition, EPA has been engaged in discussions with the chlorpyrifos registrants that could result in further use limitations affecting the outcome of EPA's assessment. The Proposed Interim Decision incorporating these updated assessments is anticipated for public availability and comment by October 2020. If EPA were compelled to act in advance of these registration review activities, none of these assessments would be available to inform that review. For example, OPP is pursuing the use of surface water monitoring data to confidently estimate pesticide concentrations in surface water that may be sourced by community water systems. A meeting of the FIFRA Scientific Advisory Panel is planned for obtaining expert feedback on tools and methodologies currently in development for using surface water monitoring data quantitatively in drinking water assessments. While the focus of the SAP is not specific to chlorpyrifos, the EPA will consider any recommendations from the SAP that are appropriate for inclusion in the chlorpyrifos drinking water assessment.

B. Objections Asserting That EPA Has Found Chlorpyrifos To Be Unsafe

The Objectors argue that EPA not only failed to make a safety finding in denying the Petition, but that it has never disavowed previous EPA findings that it could not conclude chlorpyrifos is safe with respect to both the potential for adverse neurodevelopmental effects and harmful drinking water exposures. In particular, the objections point to various statements in EPA risk assessments and in EPA's 2015 proposed tolerance revocation action asserting that EPA is unable to conclude that chlorpyrifos tolerances are safe.

Contrary to these assertions, as noted by Corteva in its response to the objections, EPA has not made any findings that chlorpyrifos tolerances are not safe. In fact, EPA's last final action with respect to the safety of chlorpyrifos tolerances was its determination in 2006 that chlorpyrifos and the other pesticides in the organophosphate class meet the FFDCA safety standard in connection with FIFRA section 4 reregistration and FFDCA section 408(q) tolerance reassessment. This is the only regulatory finding currently in effect for chlorpyrifos as EPA has taken no final action on the proposed rule it published in 2015 to comply with the Ninth Circuit mandamus order in the *PANNA* v. *EPA* decision. Proposed rules are just that—proposals; they do not bind federal agencies. Indeed, EPA made clear it was issuing the proposal because of the court order, without having resolved many of the issues critical to EPA's FFDCA determination and without having fully considered comments previously submitted to the Agency (69 FR 69079, 69081–83). Similarly, risk assessments that underly proposed rules are not final agency actions and likewise are not binding.

At this stage, EPA may choose to finalize, modify or withdraw the proposal based on the comments received and EPA's evaluation following its review of the comments. Until such time, EPA's statements in the proposed rule are not binding pronouncements with respect to EPA's decision whether to grant or deny the Petition. See, *e.g., Northwest Coalition for Alternatives to Pesticides* v. *EPA,* 544 F.3d 1043, 1051 (9th Cir. 2008) ("as long as agencies follow the proper administrative procedures, they have the authority to change their minds before issuing a final order"); *Public Citizen Health Research Grp.* v. *FDA,* 740 F.2d 21 (D.C. Cir. 1984) ("Neither the substance of the decision to require further study nor the circumstances leading to the decision . . . suffice, however, to permit us to leapfrog back over the Secretary's decision . . . hold the agency to its preliminary decision to promulgate a labeling requirement. In connection with the registration review of chlorpyrifos, which EPA expects to complete in advance of the October 1, 2022 statutory deadline, EPA will make a determination regarding the safety of chlorpyrifos and will either finalize, modify or withdraw the proposal at that time.

With respect to objections related to drinking water, as explained in Unit II., a party may not raise issues in objections unless they were part of the petition. *Corn Growers* v. *EPA,* 613 F.3d 266 (D.C. Cir. 2010), cert. denied, 131 S. Ct. 2931 (2011). The Petition did not identify drinking water exposure as a basis for seeking tolerance revocation, and the Objectors cannot therefore raise that concern as a basis for challenging EPA's denial of the Petition. The mere fact that EPA is considering the potential impact of chlorpyrifos exposures in drinking water in the Agency's FIFRA section 3(g) registration review does not somehow provide Petitioners and Objectors with a vehicle for introducing that topic in the objections process on the Petition denial. And the objections phase of the petition process does not provide Petitioners a means to effectively start the petition process over again by raising issues that were not originally raised in the 2007 petition to revoke. Accordingly, EPA denies all objections regarding drinking water exposures. To be clear, however, EPA is continuing its

FIFRA section 3(g) registration review and to complete its evaluation of drinking water exposures to chlorpyrifos. EPA will address these issues in its upcoming registration review decision.

C. Objections Asserting That the Denial Order Failed To Respond to Significant Concerns Raised in Comments

The Objectors claim that EPA has committed procedural error in failing to respond to certain comments raised in comments to EPA's 2014 Revised Human Health Risk Assessment and the 2015 proposed revocation. The Objectors appear to assert that in the absence of any comment response document in the record, EPA has violated the requirements of section 553(c) of the Administrative Procedure Act (APA) which requires agencies to give consideration to relevant matter submitted during the comment period on proposed rules. While these objections correctly recite the requirements of the APA rulemaking provisions, the requirement to respond to comments on proposed rules applies to the "rules adopted" by agencies—*i.e.*, final rules—and EPA has neither finalized nor withdrawn the 2015 proposed revocation rule. Further, the FFDCA does not require EPA to respond to rulemaking comments in issuing petition denial orders under FFDCA section 408(d)(4). In connection with EPA's completion of the FIFRA section 3(g) registration review of chlorpyrifos, EPA will either finalize or withdraw the proposed rule and address significant comments on the proposal at that time. But EPA has no obligation to respond to rulemaking comments in denying the Petition or responding to objections, both of which are adjudicatory actions that are not part of the rulemaking process.

In addition to raising procedural error, Objectors appear to adopt as their own substantive objections some of the comments on the proposed rule and risk assessment. Specifically, they focus on comments asserting that (1) EPA's use of 10% cholinesterase as a regulatory standard is not protective for effects to children's developing brains; (2) EPA inappropriately used Corteva's PBPK model, which is ethically and scientifically deficient, to reduce inter and intra-species safety factors; and (3) EPA has not properly accounted for effects from inhalation of chlorpyrifos from spray drift and volatilization.

The comments adopted by the Objectors regarding effects on the developing brain mirror the claims raised in the Petition regarding the potential for adverse neurodevelopmental effects. Accordingly, EPA restates its response provided in Unit VII.A.1. that the Petition and the objections fail to meet burden of presenting evidence sufficiently valid, complete and reliable to demonstrate that chlorpyrifos results in neurodevelopmental effects that render its tolerances not safe.

With respect to EPA's use of the Corteva PBPK model, these claims, as with claims respecting drinking water, were not raised in the Petition and cannot be raised for the first time in the objections phase of the petition process. Further, the Objections appear to oppose EPA's use of the PBPK model in conducting the assessment underlying EPA's 2014 and 2016 risk assessments and 2015 proposed tolerance revocation and do not appear to address EPA's Petition denial. This objection therefore does not appear to be relevant to the Denial Order. For these reasons, this objection is also denied.

Regarding the objections related to inhalation risk, Objectors raise three distinct issues from the public comments that relate to EPA's completed inhalation exposure assessment addressing the potential for bystanders to experience cholinesterase inhibition from exposure to spray drift at the time of application and volatilized chlorpyrifos following application. First, the Objectors dispute EPA' s legal authority not to consider in its risk assessment exposures to chlorpyrifos from illegal spraying prohibited by product labeling. Second, the Objectors assert that the Denial Order inappropriately relied on two recent Corteva studies on the effects of chlorpyrifos in its vapor phase to conclude that volatilized chlorpyrifos presents no risk of cholinesterase inhibition. Third, the Objectors assert that documented poisoning incidents demonstrate that the no-spray buffer-zones that EPA approved on product labeling in 2012 are inadequate to address harm from spray drift. Objectors point specifically to a May 2017 poisoning incident in Kern County, California, involving a total of 50 people who were either harmed or put at risk, as evidence for their concern.

In response, EPA believes it is lawful and appropriate for it to consider federally enforceable chlorpyrifos product labeling restrictions in assessing the extent of bystander risk from spray drift under both the FFDCA and FIFRA. Under FIFRA, pesticide labeling use instructions are enforceable limits on the use of the product that serve as the basis for EPA's evaluation of potential risks. Indeed, in registering pesticides, FIFRA section 3(c)(5) directs EPA to register pesticides when, among other things, a pesticide "will perform its intended function without unreasonable effects on the environment" and "when used in accordance with widespread and commonly recognized practice it will not generally cause unreasonable adverse effects on the environment." These directives functionally instruct EPA to consider the intended, widespread and commonly recognized use of a pesticide as set forth on proposed product labeling in determining whether the pesticide will cause unreasonable adverse on the environment. While these provisions do not serve as a bar to EPA considering the impacts from unlawful misuse, unless such misuse is a widespread or commonly recognized practice, it does not provide a basis for regulatory action under FIFRA or a basis for determining that current tolerance levels are unsafe. Rather, misuse is first and foremost a matter for enforcement under FIFRA. It should also be noted that because chlorpyrifos is a restricted use pesticide, applicators must have specific training meant, in part, to assure proper pesticide application. When these restrictions are followed, exposures are significantly limited. To be clear, while drift is minimized when applicators follow label directions, EPA does assume that some residues may settle off-target, and that there may be dermal and incidental oral exposure from contacting residential turf adjacent to treated fields. To address the potential for cholinesterase inhibition from these exposures, EPA assessed the risk from these exposures and establishes appropriate distances between such locations and the site of application. Accordingly, following EPA's assessment of spray drift in 2012, the chlorpyrifos registrants agreed to place additional limitations on use to include use rate reductions and spray drift buffers that are sufficient to eliminate a risk of cholinesterase inhibition from lawful use.

With respect to the objections concerning volatility and the potential for cholinesterase inhibition, EPA has not changed its position set forth in the Denial Order and does not believe it is disregarding the potential for volatilization exposures. Exposure to low levels of vapor-phase chlorpyrifos following application near treated fields is possible. After the Agency's 2011 preliminary risk assessment, Corteva submitted toxicity data that measured cholinesterase inhibition resulting from acute exposure to vapors of chlorpyrifos and its oxon rather than exposure to

aerosols of these compounds as was done for previous assessments. Since inhalation exposure to bystanders will be only to vapor phase chlorpyrifos rather than aerosols due to spray drift restrictions, use of these data to assess inhalation risk of cholinesterase inhibition to bystanders is appropriate. In these vapor-phase toxicity studies, test animals were exposed in atmospheres containing saturation concentrations of chlorpyrifos and its oxon, the maximum potential level of the compounds in air. No cholinesterase inhibition was observed, and the studies were determined to have been conducted properly using saturation concentrations of the compounds and controls appropriate for these types of studies, *i.e.*, animals receiving no pesticide exposure, as further explained in "*Chlorpyrifos: Reevaluation of the Potential Risks from Volatilization in Consideration of Chlorpyrifos Parent and Oxon Vapor Inhalation Toxicity Studies, W. Britton, W. Irwin, 6/25/14.*"

EPA has also done a comprehensive review of chlorpyrifos incidents and found that most were due to accidents and misuse as specified in EPA's most recent final incident review "*Chlorpyrifos: Tier II Incident Report, S. Recore and K. Oo, 7/27/11.*" The agency is aware of the referenced Kern County chlorpyrifos incident that occurred in 2017 in which the pesticide appears to have been applied in a manner in which direct drift onto bystanders occurred, a case of misuse. Spray drift buffers address exposure to bystanders when chlorpyrifos is applied as required by the pesticide label. In addition, it should be noted that EPA's 2000 cancellation of homeowner products and many indoor and outdoor non-residential uses (*e.g.*, schools and parks where children may be exposed) has led, according to data from 2002–2010, to a 95% decrease in the number of incidents reported in residential areas. In sum, EPA does not believe available incident data suggests that there exists a widespread and commonly recognized practice of misusing chlorpyrifos and EPA therefore believes it is appropriate to use the enforceable label instructions as the basis for evaluating the potential for inhalation exposure from spray drift and volatilization.

VIII. Regulatory Assessment Requirements

As indicated previously, this action announces the Agency's order denying objections filed under FFDCA section 408. As such, this action is an adjudication and not a rule. The regulatory assessment requirements imposed on rulemaking do not, therefore, apply to this action.

IX. Submission to Congress and the Comptroller General

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, does not apply because this action is not a rule for purposes of 5 U.S.C. 804(3).

X. References

The following is a listing of the documents that are specifically referenced in this document. The docket includes these documents and other information considered by EPA, including documents that are referenced within the documents that are included in the docket, even if the referenced document is not physically located in the docket. For assistance in locating these other documents, please consult the person listed under **FOR FURTHER INFORMATION CONTACT**.

1. The Petition from NRDC and PANNA and EPA's various responses to it are available in docket number EPA–HQ–OPP–2007–1005 available at *http://www.regulations.gov*.
2. The objections submitted on the Petition Denial are available in docket number EPA–HQ–OPP–2007–1005 available at *http://www.regulations.gov*.
3. For additional information on the organophosphate cumulative risk assessment, see *http://www.epa.gov/pesticides/cumulative/2006-op/op_cra_main.pdf*.
4. FIFRA Scientific Advisory Panel (2016). "Chlorpyrifos: Analysis of Biomonitoring Data". Available at: *https://www.epa.gov/sap/meeting-materials-april-19-21-2016-scientific-advisory-panel*.
5. For additional information on the 2000 chlorpyrifos IRED and 2006 chlorpyrifos RED, see *https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_PC-059101_1-Jul-06.pdf*.
6. FIFRA Scientific Advisory Panel (2008). "Scientific Issues Associated with Chlorpyrifos and PON1". Available in docket number EPA–HQ–OPP–2008–0274 available at *http://www.regulations.gov*.
7. EPA, 2012. "Guidance for Considering and Using Open Literature Toxicity Studies to Support Human Health Risk Assessment" as well as it's "Framework for Incorporating Human Epidemiologic & Incident Data in Health Risk Assessment." Available at *https://www.epa.gov/sites/production/files/2015-07/documents/lit-studies.pdf*.
8. EPA, 2016. Record of Correspondence. Available in docket number EPA–HQ–OPP–2015–0653.

List of Subjects in 40 CFR Part 180

Environmental protection, Administrative practice and procedure, Agricultural commodities, Pesticides and pests, Reporting and recordkeeping requirements.

Dated: July 18, 2019.

Alexandra Dapolito Dunn,

Assistant Administrator, Office of Chemical Safety and Pollution Prevention.

[FR Doc. 2019–15649 Filed 7–23–19; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 300

[Docket No. 190325272–9537–02]

RIN 0648–XP002

Western and Central Pacific Fisheries for Highly Migratory Species; 2019 Bigeye Tuna Longline Fishery Closure

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Temporary rule; fishery closure.

SUMMARY: NMFS is closing the U.S. pelagic longline fishery for bigeye tuna in the western and central Pacific Ocean because the fishery has reached the 2019 catch limit. This action is necessary to ensure compliance with NMFS regulations that implement decisions of the Western and Central Pacific Fisheries Commission (WCPFC).

DATES: Effective 12:01 a.m. local time July 27, 2019, through December 31, 2019.

ADDRESSES: NMFS prepared a plain language guide and frequently asked questions that explain how to comply with this rule; both are available at *https://www.regulations.gov/docket?D=NOAA-NMFS-2019-0085*.

FOR FURTHER INFORMATION CONTACT: Rebecca Walker, NMFS Pacific Islands Region, 808–725–5184.

SUPPLEMENTARY INFORMATION: Pelagic longline fishing in the western and central Pacific Ocean is managed, in part, under the Western and Central Pacific Fisheries Convention Implementation Act (Act). Regulations governing fishing by U.S. vessels in accordance with the Act appear at 50 CFR part 300, subpart O.

NMFS established a calendar year 2019 limit of 3,554 metric tons (t) of bigeye tuna (*Thunnus obesus*) that may be caught and retained in the U.S. pelagic longline fishery in the area of application of the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the