

Hazard Identification Materials for Consideration of the Developmental Toxicity of Chlorpyrifos

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**Reproductive and Cancer Hazard Assessment Branch
Office of Environmental Health Hazard Assessment
California Environmental Protection Agency**

Introduction

On [November 29, 2017, at a public meeting in Sacramento](#), chlorpyrifos will be considered for listing under Proposition 65¹, by the Developmental and Reproductive Toxicant Identification Committee (DARTIC), a committee of the Office of Environmental Health Hazard Assessment's (OEHHA) Science Advisory Board and the state's qualified experts regarding findings of reproductive toxicity for purposes of Proposition 65. The DARTIC will deliberate on whether or not chlorpyrifos has been "clearly shown by scientifically valid testing according to generally accepted principles to cause developmental toxicity"². This document describes the materials provided to the committee.

The DARTIC considered chlorpyrifos in 2008 but did not add it to the Proposition 65 list at that time. Substantial new, relevant data on developmental toxicity have become available since the chemical was previously considered for listing.

Hazard Identification Materials on the Developmental Toxicity of Chlorpyrifos

The following materials are being provided to the DARTIC in electronic form:

- The complete September 2008 OEHHA hazard identification document (HID), "Evidence on the Reproductive and Developmental Toxicity of Chlorpyrifos".
 - Excerpted sections of that document relevant to developmental toxicity.
 - Additional materials provided by OEHHA to the DARTIC that became available at about the same time as the HID.
 - Copies of studies relating to the developmental toxicity of chlorpyrifos that were cited in the 2008 HID.

¹ The Safe Drinking Water and Toxic Enforcement Act of 1986, codified at Health and Safety Code section 25249.5 *et seq.*

² Health and Safety Code section 25249.8(b) and Title 27, Cal. Code of Regs., section 25305(b)(1)

- Public comments submitted to the DARTIC in 2008 regarding possible listing of chlorpyrifos, including any additional materials provided that are relevant to developmental toxicity.
- The US Environmental Protection Agency (US EPA) reports, “Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review (2014)” and “Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review (2016)”. These reports, particularly the 2014 report, extensively review recent scientific literature on chlorpyrifos and developmental toxicity.
 - Excerpted sections of these US EPA reports relevant to developmental toxicity.
 - Copies of studies relating to the developmental toxicity of chlorpyrifos that were cited in these US EPA reports.
- Copies of additional studies of the developmental toxicity of chlorpyrifos that were not reviewed in the materials provided to the DARTIC in 2008 or in the 2014 and 2016 US EPA reports.

The 2008 OEHHA hazard identification materials on chlorpyrifos and the 2014 and 2016 US EPA reports are available to the public on OEHHA's website at (<https://oehha.ca.gov/proposition-65/crn/hazard-identification-materials-consideration-developmental-toxicity>). Copies of copyrighted materials (e.g., published studies) may be requested through OEHHA or from the copyright holder. Copies of studies submitted to the California Department of Pesticide Regulation and considered confidential may be accessed in their entirety by members of the public at 1001 I Street, Sacramento, CA 95812, upon completion of the affirmation required under Government Code section 6254.2.

Portions of Provided Documents (2008 OEHHA HID, US EPA 2014 and 2016 Reports) Relevant to Developmental Toxicity

To assist the committee and the public, the sections from the 2008 OEHHA HID and the 2014 and 2016 US EPA reports that are directly relevant to developmental toxicity are identified below.

- OEHHA, 2008. Evidence on the Developmental and Reproductive Toxicity of Chlorpyrifos
 - Section A. Abstract
 - Section C. Developmental Toxicity
 - Appendix 1: Glossary of terms for evaluating neurobehavior
 - Appendix 2: Acronyms and Abbreviations

- US EPA, 2014. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review
 - Section 4.4.2 Neurodevelopmental Outcomes in Laboratory Animals
 - Section 4.4.3 Plausible hypotheses on MOA/AOP for neurodevelopmental outcomes
 - Section 4.5 Epidemiology Studies in Mothers and Children
 - Section 4.6 Weight of Evidence Analysis
 - Section 4.7 Safety Factor for Infants and Children (FQPA Safety Factor)
 - Section 4.8.1 Dose-Response Assessment: Durations of Exposure, Critical Windows of Exposure, & Temporality of Effects
 - Appendix 1. Evaluation of Experimental Toxicology Data
 - Appendix 2. Detailed Review and Synthesis of Three Children's Environmental Health Cohort Studies
 - Appendix 3. Epidemiology Study Specific Evaluations
 - Appendix 4. Detailed Summary Tables of Children's Environmental Health Epidemiology Studies
 - Appendix 6. Columbia Center for Children's Environmental Health (CCCEH) Epidemiology Data Acquisition "Raw Data" Request
 - Appendix 11. New Literature on Chlorpyrifos since the 2012 FIFRA SAP Meeting [only studies relevant to developmental toxicity]

- US EPA, 2016. Chlorpyrifos: Revised Human Health Risk Assessment for Registration Review
 - Section 5.2 Summary of the Literature Review on Neurodevelopmental Effects