

**UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLUMBIA**

CENTER FOR FOOD SAFETY, et al.,

*Plaintiffs,*

vs.

ENVIRONMENTAL PROTECTION AGENCY,  
et al.,

*Defendants,*

and

CORTEVA AGRISCIENCE, LLC,

*Defendant-Intervenor.*

Case No. 1:23-cv-1633-CKK

**PLAINTIFFS' MOTION FOR  
SUMMARY JUDGMENT AND  
MEMORANDUM OF POINTS AND  
AUTHORITIES IN SUPPORT OF  
MOTION FOR SUMMARY  
JUDGMENT (REDACTED)**

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## NOTICE OF MOTION

Pursuant to Rule 56 of the Federal Rules of Civil Procedure, Plaintiffs Center for Food Safety, Pesticide Action Network North America, and Alianza Nacional de Campesinas (Plaintiffs) respectfully move this Court for summary judgment on their First Amended Complaint on the grounds that the Environmental Protection Agency's (EPA) registration decisions for the herbicides Enlist One and Enlist Duo violate the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and should thus be set aside. This motion is based on the pleadings and Administrative Record on file in this case, as well as the declarations submitted herewith.

### PLAINTIFFS' MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT

#### INTRODUCTION

This case challenges EPA's decision to renew the registrations for two highly toxic and widely used herbicides, Enlist One and Enlist Duo, without conducting the rigorous risk assessments and analyses that FIFRA demands. Under FIFRA, EPA may not register (or, as here, renew) a pesticide unless it demonstrates that the pesticide will not cause "unreasonable adverse effects on the environment." 7 U.S.C. §§ 136a(c)(5)(C), (D). EPA fell far short of that mandate.

And the stakes could not be higher. Enlist One and Enlist Duo contain 2,4-dichlorophenoxyacetic acid choline salt ("2,4-D"), a chemical so toxic that it threatens not just the targeted weeds, but entire ecosystems—poisoning monarch butterflies and their milkweed habitat, contaminating water supplies and wildlife through runoff and spray drift, and imposing devastating economic costs on farmers whose crops are damaged by off-target exposure. Moreover, these herbicides are driving the evolution of "superweeds" resistant not only to 2,4-D itself, but to multiple herbicides. This epidemic of resistance threatens vast swaths of U.S.

agriculture, forcing dependence on ever-more-toxic chemical cocktails, imposing billions of dollars in costs on farmers, and degrading the environment for generations.

EPA tilted the scales decisively in favor of continued registration of these controversial herbicides by systematically ignoring and/or minimizing their costs, while also inflating the claimed benefits. The Enlist registration decisions violated FIFRA's mandates in at least three fundamental respects.

First, EPA relied on outdated usage data from the early years of Enlist commercialization, despite the record evidence showing that use of Enlist products has increased dramatically in recent years—and will continue to increase in the future. By downplaying current usage and failing to account for predictable increases in future use, a key component of the registration's cost-benefit assessment's underlying metrics is skewed and contrary to the record, rendering the entire assessment fundamentally flawed. Furthermore, EPA dramatically understated the true costs of Enlist products by ignoring the mounting evidence of herbicide resistance. Despite EPA's acknowledgment that 2,4-D induces "highly concerning" metabolic resistance that poses a "serious threat" of creating weeds immune to multiple herbicides, EPA failed to actually quantify these costs or consider their economic impact on farmers and the environment. Finally, as to human health risks, EPA relied entirely on a human health risk assessment for glyphosate, despite the fact that this very same risk assessment was eviscerated in a 2022 court decision successfully challenging glyphosate's registration review and vacating it. EPA also discounted evidence that both 2,4-D and glyphosate are carcinogenic.

Second, EPA overstated the claimed benefits of Enlist products by portraying them as effective tools for managing herbicide-resistant weeds when the record evidence is decidedly to the contrary. EPA's own data reveals that farmers predominantly use Enlist products as their sole

mode of action against resistant weeds—precisely the pattern of overreliance that EPA acknowledges “creates intense selection pressure for resistance.” EPA also inflated benefits and skewed the cost-benefit baseline by comparing Enlist products favorably over the use of another controversial, and already twice-vacated pesticide, dicamba, conveniently ignoring that EPA itself approved dicamba despite its well-documented problems. By overstating benefits and downplaying risks, EPA’s registration is arbitrary and capricious, in violation of FIFRA.

Third, EPA’s mitigation measures not only fail to address the identified risks but actually threaten to exacerbate them. EPA’s “pick list” system for Enlist runoff control allows most farmers to continue their current practices unchanged, while claiming credit for reductions that never happen. Even worse, EPA’s own scientists concluded that 3-foot vegetative buffers are ineffective against runoff, yet EPA authorized their use anyway, without explanation. These paper-thin mitigation measures are contrary to the record evidence and merely provide regulatory cover for approvals that will cause environmental harm.

Accordingly, Plaintiffs respectfully request that the Court grant summary judgment and vacate EPA’s unlawful registrations of Enlist One and Enlist Duo. Such relief is not only consistent with FIFRA and the APA but also essential for protecting the environment and human health.

### **FACTUAL BACKGROUND**

This case challenges EPA’s registration renewal of two herbicides sold by Corteva Agriscience LLC (formerly Dow AgroSciences): Enlist One and Enlist Duo. Both Enlist products contain 2,4-dichlorophenoxyacetic acid choline salt (“2,4-D”), an active ingredient with toxic effects on crops, plants, pollinators, birds, and other species. A018 at 8. Enlist Duo contains an additional toxic ingredient: glyphosate dimethylammonium salt (“glyphosate”). *Id.* at 14.

Both Enlist products are approved for controlling weeds in corn, soybean, and cotton operations in 34 states. A021 at 4. Corteva developed Enlist products to be sprayed throughout the growing season on patented corn, soybean, and cotton crops that have been genetically engineered to survive multiple “post-emergent” applications of these toxic herbicides, as well as a third weedkiller, glufosinate. A029 at 9. Corteva markets Enlist products with these patented Enlist-resistant seeds as a “weed control system.” *Id.* at 3.

## **I. Adverse Impacts of Enlist Products**

### **A. Herbicide Resistance**

Along with dicamba pesticides (developed and sold by Bayer), Enlist products are the pesticide industry’s quick fix “solution” to the agricultural epidemic it created with glyphosate-resistant GE crops: glyphosate-resistant “superweeds.” *Id.* at 8. Since the mid-1990s, agrichemical companies have sold genetically engineered (GE) seeds immune to the herbicide glyphosate, allowing growers to repeatedly douse fields with glyphosate to kill weeds without killing their crops, dramatically increasing overall pesticide output in the environment and making glyphosate the most used pesticide in history.<sup>1</sup> However, widespread use of this herbicide on glyphosate-resistant crops triggered an epidemic of glyphosate-resistant superweeds that now infest millions of acres of U.S. farmland.<sup>2</sup> *See, e.g.*, D085 at 3-4.

These superweeds have had devastating impacts on farmers and the environment. Farmers have been forced to incur significant increased costs to try and slow their spread. *Id.* In 2010, growers incurred costs over \$67 and \$23 per acre in corn and soybeans, respectively, to

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<sup>1</sup> *See, e.g.*, D085 at 3-4; D039 at 15-16; D076 at 6-7; EPA\_0003217.

<sup>2</sup> The spread of herbicide resistance occurs because “[a] few individuals with natural resistance to the herbicide survive an application of the herbicide,” “these individuals reproduce[,] and as each generation is exposed to the herbicide, the proportion of resistant individuals in the population increase and eventually the herbicide-resistant individuals dominate . . . .” D085 at 4.

control glyphosate-resistant weeds, resulting in over \$2.5 billion in expenditures. *Id.* at 3.<sup>3</sup> Georgia cotton growers similarly spent over \$1 billion to control glyphosate-resistant Palmer amaranth over 10-plus years through 2014. *Id.* at 3-4. Glyphosate resistance also results in decreased yields. D071 at 14; *see also* EPA\_0003219 [REDACTED]

This costly superweed epidemic taught the agricultural world a new lesson: herbicides are prone to trigger rapid evolution of resistant weeds, especially when used with herbicide-resistant crops. Rather than learn from its mistakes, however, the industry has instead doubled down on their flawed approach and continues to market the next generation of GE crops and pesticide systems as the “solution” to the superweed problem it created.

In response to the growing problem of glyphosate-resistant weeds, seed companies and agricultural chemical manufacturers turned to synthetic auxin herbicides, such as dicamba and 2,4-D. A029 at 8. While Corteva engineered patented soybean and cotton seeds with resistance to 2,4-D (Enlist), the herbicides at issue here, Monsanto (now Bayer) did the same for dicamba (Xtend). *Id.* Monsanto was first, with the broadscale introduction of its dicamba-resistant soybean and cotton system in 2017. *See* D042 at 8-11. The widespread adoption and overuse of the dicamba system quickly led to the evolution of dicamba-resistant weeds beginning as early as 2019 and 2020, forcing farmers to significantly increase weed control costs. *See* D074; D080; D078; *see also* D042 at 12, 13. Weed scientists compared burgeoning dicamba-resistance to the preceding glyphosate-resistant weed epidemic the dicamba system was supposed to solve, and EPA concluded that mandatory resistance management measures were failing. D042 at 14.

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<sup>3</sup> Assuming the 61 million acres of glyphosate-resistant weed-infested fields in 2012 were equally divided between corn and soybeans, growers incurred \$2.75 billion in increased control costs: (30.5 million x \$67) + (30.5 million x \$23) = \$2.745 billion.

History is repeating itself once again with the Enlist registrations at issue here. The use of Enlist products threatens to increase the spread of 2,4-D resistance, as well the spread of cross-resistance to other synthetic auxin herbicides, like dicamba. A028 at 9-10. By the time EPA registered Enlist Duo, 2,4-D-resistant weeds were already confirmed in several states, and 2,4-D resistance has only continued to spread to more states since then. D062. Worse, while most herbicides foster evolution of weeds resistant only to the herbicide that is applied, 2,4-D induces resistance not only to itself, but *also to related auxin herbicides* like dicamba (i.e., cross-resistance). A029 at 11-12. Moreover, the weed's evolved capacity to metabolize 2,4-D and dicamba also give it the ability to break down entirely unrelated herbicides like atrazine and HPPD inhibitors<sup>4</sup> (i.e., metabolic resistance). *Id.* at 11. EPA characterizes this process as “highly concerning” because it poses a “serious threat” of rendering the most problematic herbicide-resistant weeds *additionally* immune to 2,4-D and many other herbicides. A029 at 11-12. Metabolic resistance also confers *immediate* resistance “the first time they are used” versus the “multiple generations” it takes for cross-resistance to evolve. D085 at 3.

These concerns have already come to bear. State extension agencies have already received numerous reports of escapes following dicamba and Enlist applications,<sup>5</sup> and Enlist-induced weed resistance can spread vast distances via wind, farm equipment, birds, and animal feed, harming non-Enlist farmers. *See* D056 at 1-2; D017 at 6, 56; EPA\_0003222.

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<sup>4</sup> HPPD inhibitors are a class of herbicides that kill weeds by blocking the 4-hydroxyphenylpyruvate dioxygenase (HPPD) enzyme.

<sup>5</sup> *See, e.g.*, D035 (dicamba and 2,4-D-resistant Palmer amaranth escapes); D044 (rising dicamba, glufosinate, and 2,4-D-resistant weed escapes); D045 (glufosinate-resistant pigweed and Palmer amaranth escapes in Arkansas); D062 (cross-resistance to 2,4-D in dicamba-resistant waterhemp); D073 (dicamba and 2,4-D Palmer amaranth escapes in 2021); D074 (confirmed Palmer amaranth resistance to 2,4-D and dicamba in Kansas); D079 (Palmer amaranth, junglerice, and goosegrass escapes from follow-up applications of dicamba and 2,4-D); D081 (managing dicamba or 2,4-D-resistant Palmer amaranth).

## **B. Environmental Effects**

Due to the toxic effects of 2,4-D and glyphosate, even in small amounts, Enlist products can have substantial adverse effects on the environment. *See, e.g.*, A018 at 8, 14. Direct contamination occurs from applications on target crops, and additional *indirect* contamination occurs via spray drift, vapor drift, runoff, erosion, and other routes of exposure by which Enlist moves off-target and contaminates non-target environments. *See* A021 at 8-21.

Enlist products adversely affect the survival, growth, and reproduction of individual plants and animals that are exposed to Enlist products via spray drift or runoff, including crops grown on neighboring fields. A009 at 4; *see also* A008 at 2-3. Since initially authorizing Enlist products on corn, cotton, and soybean crops, EPA has received nearly 300 reports of spray drift incidents involving 2,4-D. A028 at 8. Despite limited use, in 2018 and 2019 alone, EPA received multiple reports specifically involving damage to cotton fields from off-target movement of Enlist One or Enlist Duo. *Id.* at 8-9. Because cotton is so sensitive to damage from 2,4-D drift, experts predict substantially greater drift injury “if Enlist is sprayed on a large scale...” D023. Specialty crop growers in Ohio identified 2,4-D as a leading cause of costly drift injury to their crops in 2020. D042 at 26-27, 31. EPA also acknowledged that “the number of actual incidents associated with 2,4-D” is likely higher than reported. D052 at 91.

Both 2,4-D and glyphosate are toxic to several species found on target fields and nearby areas, such as mammals, birds, bats, fish, amphibians, and pollinators, as well as plants that provide important habitat for nearby wildlife. A009 at 4. Moreover, “2,4-D poses a chronic risk to monarch larvae located on milkweed of corn, cotton and soybean fields.” A018 at 67.

Enlist products harm wildlife through direct contact with Enlist applications on crops. A009 at 4. Enlist products also indirectly harm wildlife through habitat contamination and

depletion of resources and cause significant harm to surrounding farms and sensitive plants. *See id.* Bees are directly exposed to Enlist when they feed on plants directly sprayed with Enlist, or any plants in the nearby area exposed to Enlist runoff or drift. *See* A018 at 60-61. Spray and vapor drift from Enlist can also indirectly affect pollinators, such as monarch butterflies, by destroying habitat and depleting food sources, such as flowering plants that provide nectar for adult monarch butterflies and food for monarch larvae. A009 at 5. Enlist products also reach and contaminate aquatic environments via runoff from rainwater, stormwater, irrigation into surface waters, and chemical-leaching through the soil into groundwater. *Id.*

### C. Human Health Effects

Both 2,4-D and glyphosate pose serious health concerns for those exposed, especially farmers and farmworkers. However, EPA's assessment of the human health impacts, or costs, for this latest registration renewal did not change from the previous assessments. A021 at 6-8. EPA found no "risk concerns" for most exposure to 2,4-D in the Enlist products and claims that label restrictions mitigate risks concerns for occupational inhalation exposure. *Id.* at 7. For 2,4-D human health, EPA considered its prior human health risk assessment for registration review (second revision, dated August 21, 2019, EPA\_101537), its human health risk assessment for the proposed use of 2,4-D on herbicide-tolerant cotton (dated October 27, 2016, EPA\_101302), its human health risk assessment for 2,4-D use on herbicide-tolerant corn and soy (dated August 8, 2013, EPA\_101078), and its "verification" that no updates from these past assessments was needed. A021 at 7. [REDACTED]

[REDACTED] However, mounting evidence showing a connection between 2,4-D and non-Hodgkin lymphoma has emerged since EPA's 40-year-old "not classifiable" classification of 2,4-

D. For example, in 2015, the World Health Organization’s International Agency for Research on Cancer (IARC) concluded that 2,4-D is “possibly carcinogenic to humans.”<sup>6</sup>

As to glyphosate, EPA similarly found no need to change or update its past human health risk assessment, stating it continued to rely on its 2017 human health risk assessment for glyphosate’s registration review. A021 at 7-8. That risk assessment was issued as part of EPA’s registration review decision in 2020, which finalized both its “no human health risk” and its “no cancer risk” findings for glyphosate. However, a federal court of appeals found the very same risk assessment on which EPA here again misrelies was contrary to EPA’s own cancer guidelines and the recommendations of its own expert scientific advisors (known as a Scientific Advisory Panel or SAP) in multiple ways and struck down the registration review, which has not been re-issued. *See Nat. Res. Def. Council (NRDC) v. EPA*, 38 F.4th 34 (9th Cir. 2022).

## II. Registration

EPA first registered Enlist Duo for use in six states in 2014 following the U.S. Department of Agriculture’s first-ever deregulation of genetically engineered soybean, corn, and cotton seeds tolerant to 2,4-D. A029 at 3. As explained above, these herbicide-tolerant crop systems, whether “Roundup-Ready” or “dicamba-resistant” or “Enlist-resistant,” allow pesticides to be sprayed “over-the-top” of crops *engineered* with immunity, leading to more overall pesticide use and output, as well as an increase in spraying applications and environmental exposures to pesticides at new and different times of the year (e.g., the growing season).

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<sup>6</sup> EPA, Response to Public Comments Received Regarding the Evaluation of Enlist Duo on Enlist Corn, Cotton, and Soybeans at 3, EPA-HQ-OPP-2016-0594-0662 (Jan. 12, 2017); *see also e.g.*, EPA 0105025-26

EPA 0105026

EPA subsequently amended the registration for Enlist Duo in 2015 to expand its use “on herbicide tolerant Enlist corn and Enlist soybean” in nine additional states. *Id.* In 2017, EPA amended the registration to “conditional” but added new use on Enlist-tolerant cotton in the fifteen previously approved states, as well as an additional nineteen states; and most recently in 2022, wherein EPA renewed Enlist Duo approval for use on Enlist-tolerant corn, soybeans, and cotton in 34 states. A021 at 5. In 2017, EPA granted a five-year registration to Enlist One, the standalone 2,4-D formulation, for the same uses as Enlist Duo. *Id.* EPA renewed both the registration for Enlist One and Enlist Duo in 2022. *Id.*

### **III. Use & Usage of Enlist Products**

#### **A. Soybean**

Although Enlist Duo was first registered in 2014, Corteva delayed widespread release of Enlist soybean until early 2019. A029 at 6. The first usage of Enlist Duo was observed in soybean in 2016, but Enlist products were not widely used on soybean crops until 2019. *Id.* As a result of the delay in commercialization, the overall number of soybean acres treated with Enlist Duo between 2018 and 2019 was “negligible.” *Id.* During this period, most soybean growers sprayed Enlist after crop emergence to target glyphosate-resistant *Amaranthus* species. *Id.* Although the 2022 labels urge users to apply Enlist products with other herbicides to prevent the spread of herbicide resistance, A010 at 30-31, Enlist One and Enlist Duo were “frequently applied alone” to soybean crops. A029 at 6.

In 2020 alone, the total number of soybean acres sprayed with Enlist products increased dramatically. *Id.* For this reason, “available market research data from 2018 and 2019 *does not* reflect the amount of Enlist products currently applied to soybean” noting “further adoption of

the technology may continue in the future.” *Id.* at 7. Nonetheless, EPA does not offer an alternative method to determine the amount of Enlist products applied to soybean crops. *See id.*

As of 2021, over one-third of soybean producers have already adopted the Enlist crop system, and Corteva expects this number to increase in the future: “With an adoption rate on U.S. soybean acres of approximately 35% in 2021, the Enlist weed control system is the industry’s fastest-growing soybean herbicide system, a trend [Corteva] expects to continue with the introduction of high-performing [Enlist-resistant] soybeans.”<sup>7</sup> In 2022, Corteva “raised its . . . market penetration outlook to greater than 45% of U.S. soybean acres, up from greater than 40% expected previously.”<sup>8</sup> As Corteva continues to roll out the Enlist crop system, use of Enlist products on U.S. soybean acres will continue to rise exponentially.

## **B. Cotton**

Although 2,4-D resistant cotton was deregulated in 2015, Enlist One and Enlist Duo were not actually used on cotton crops until 2017 and 2018, respectively. A029 at 5. However, since

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<sup>7</sup> *Press Release, New Class of Pioneer® Brand Seed Products Poised to Drive Farmer Success*, CORTEVA AGRISCIENCE: NEWS CENTER (Dec. 14, 2021), <https://www.corteva.us/content/corteva/corporate/our-homepage/resources/media-center/new-class-of-pioneer-brand-seed-products-poised-to-drive-farmer-success.html>; *see also Press Release, Exclusive, New Pioneer® Brand A-Series Enlist E3® Soybeans Deliver the Total Performance Package*, CORTEVA AGRISCIENCE: NEWS CENTER (Mar. 9, 2022), <https://www.corteva.us/content/corteva/corporate/our-homepage/resources/media-center/exclusive-new-pioneer-brand-a-series-enlist-e3-soybeans-deliver-the-total-performance-package.html>.

<sup>8</sup> *Corteva Reports Second Quarter and First Half 2022 Results*, CORTEVA AGRISCIENCE: NEWS RELEASE 1, 2 (Aug. 4, 2022), [https://www.corteva.us/content/dam/dpagco/corteva/global/corporate/files/press-releases/08.04.2022\\_2Q\\_2022\\_Earnings\\_Release\\_Graphic\\_Version\\_Final.pdf](https://www.corteva.us/content/dam/dpagco/corteva/global/corporate/files/press-releases/08.04.2022_2Q_2022_Earnings_Release_Graphic_Version_Final.pdf); *see also Corteva Delivers Strong Fourth Quarter and Full-Year 2021 Results Led by Broad-Based Execution*, CORTEVA AGRISCIENCE: NEWS RELEASE CORTEVA AGRISCIENCE: NEWS RELEASE (Feb. 2, 2022), [https://www.corteva.com/content/dam/dpagco/corteva/global/corporate/files/press-releases/02.02.2022\\_4Q\\_2021\\_Earnings\\_Release\\_Graphic\\_Version\\_Final.pdf](https://www.corteva.com/content/dam/dpagco/corteva/global/corporate/files/press-releases/02.02.2022_4Q_2021_Earnings_Release_Graphic_Version_Final.pdf).

the first usage of Enlist products, adoption of the Enlist weed control system—and use of Enlist products—has increased significantly. *See id.*

During the first two years of Enlist usage, most Enlist products applied to cotton crops were applied *after* crop emergence, *id.*, which increases non-Enlist crop damage and spread of herbicide resistance. *See* A028 at 9. Enlist products were applied after crop emergence to about 90% of total cotton acres treated with Enlist products. *Id.* Cotton growers mostly used Enlist products after crop emergence to target glyphosate-resistant *Amaranthus* species. *Id.* at 14; *see also id.* at 5-6. Despite label language encouraging users to apply Enlist products with other herbicides to prevent the spread of resistant superweeds, *see, e.g.*, A010 at 14-15 (Enlist Duo) and 30-31 (Enlist One), Enlist Duo, which is a combination of 2,4-D and glyphosate, was frequently applied on its own. A029 at 6.

#### **IV. Prior Litigation**

Nonprofit organizations, including some of the same Plaintiffs here, challenged EPA's decisions to register Enlist Duo in 2014 and 2015. Pet. Review, *NRDC v. EPA*, No. 14-73353 (9th Cir. Oct. 30, 2014), ECF No. 1-1; *CFS v. EPA*, No. 15-71207 (9th Cir. Apr. 20, 2015), ECF No. 1-2; Pet. Review, *NRDC v. EPA*, No. 15-71213 (9th Cir. Apr. 20, 2015), ECF No. 1-2.

After the first litigation was voluntarily remanded on EPA motion back to the agency, the second major litigation culminated in a mixed decision, in which the Ninth Circuit granted the petition for review in part and denied it in part, rejected the Intervenors' arguments that the petitioners lacked standing, and held that the Enlist registration violated FIFRA. *Nat'l Fam. Farm Coal. v. EPA*, 966 F.3d 893, 911, 930 (9th Cir. 2020).<sup>9</sup> Specifically, the Ninth Circuit

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<sup>9</sup> The cases involving previous Enlist registrations proceeded directly to the court of appeals under FIFRA Section 16a because EPA held notice and comment, which courts have interpreted

held that EPA’s registration lacked substantial evidence because EPA failed to “consider[] how the destruction of milkweed on target fields would affect monarch butterflies.” *Id.* at 917. The court otherwise denied the petitioners’ claims under FIFRA and the Endangered Species Act. *Id.* at 922, 929. The court then remanded the registration back to EPA, ordering the agency to address the evidence that monarch butterflies are harmed by the destruction of milkweed on Enlist fields. *Id.* at 930.

## **V. The Challenged Registration Decisions.**

On January 11, 2022, EPA extended the registrations for both Enlist Duo and Enlist One for an additional seven-year term, without any notice or public comment period. These registrations are thus set to expire on January 11, 2029. *See generally* A021. On March 29, 2022, EPA amended the registrations for Enlist One and Enlist Duo to remove hundreds of county-level prohibitions, again without any prior notice or public comment. *See generally* A010.

### **A. Cost-Benefit Assessment**

In assessing the benefits of Enlist products, EPA concluded that “the main benefit” of Enlist was “to control herbicide-resistant broadleaf weeds in soybean and cotton,” particularly glyphosate resistant weeds. A029 at 2, 8. EPA admitted, however, that the benefits of Enlist products “are lower in corn” because growers have more options for weed management, including both non-Enlist 2,4-D products and non-2,4-D herbicides. *Id.* at 2. EPA further claimed that another benefit of registering Enlist products is less reliance on over-the-top dicamba products for postemergence control of herbicide-resistant weeds. *Id.* at 9-10.

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to be a “hearing” for purposes of FIFRA judicial review. However, here, despite substantially extending the registrations by seven years, EPA did *not* hold notice and comment and thus jurisdiction is proper in district court under FIFRA Section 16b.

In evaluating the impacts of Enlist products, EPA acknowledged that Enlist use causes the spread of 2,4-D resistant weeds. A028 at 9. EPA also acknowledged Enlist use leads to the spread of cross-resistance to other synthetic auxin type herbicides, like dicamba. *Id.* EPA did not, however, specify or evaluate any of the costs related to 2,4-D resistance or cross-resistance, such as increased weed control costs for farmers. *See id.* Moreover, although EPA acknowledged that “[i]ncreased use of Enlist 2,4-D, especially after crop emergence, will increase selection pressure on 2,4-D and other synthetic auxin herbicides,” *id.* at 9-10, EPA summarily concluded that “[b]oth the benefits and usage of Enlist herbicides is likely to increase in soybean and cotton in the future as multiple-herbicide-resistant broadleaf weeds continue to spread.” A029 at 14.

#### **B. Environmental Risk Assessment & Mitigation Evaluation**

On-Field Risks to Plants & Wildlife: In its ecological risk assessment for 2,4-D, EPA concluded that there are potential on-field (on the site of application) risks to terrestrial vertebrates (mammals, birds, amphibians, and reptiles), terrestrial invertebrates (including bees and monarch butterflies), and terrestrial plants. A018 at 8. In its ecological risk assessment on glyphosate, EPA similarly concluded that there are potential on-field chronic risks to non-listed animals (birds, terrestrial-phase amphibians, and reptiles) and potential risk to non-listed terrestrial and wetland plants. *Id.* at 14. There are also indirect effects to monarch butterflies due to the effects of 2,4-D or glyphosate on milkweed in application fields or nearby areas. *Id.*

Off-Field Risks to Plants & Wildlife: EPA also identified risks for non-target plants located off the treated field, which may be exposed to 2,4-D through spray drift and/or runoff. EPA ultimately concluded that the mandatory spray drift mitigation measures on the product labels, including the 30-foot downwind in-field spray drift set back, eliminate level-of-concern exceedances due to spray drift for off-field plant and animal species. A021 at 9. To mitigate risk

to non-listed off-target terrestrial and wetland plants, EPA determined that runoff mitigation measures were necessary. *Id.* at 27. These measures include required implementation of a subset of mitigation measures in a “pick-list.” *Id.* Applicators must select measures from the pick list to reach a minimum number of “credits” (4 or 6 depending on soil type), which EPA claimed will reduce runoff transport of 2,4-D and glyphosate to terrestrial and wetland habitats. *Id.*

## STATUTORY BACKGROUND

### I. FIFRA’s Cost-Benefit Analysis

EPA regulates the use, sales, and labeling of herbicides like Enlist One and Enlist Duo under FIFRA. 7 U.S.C. §§ 136–136y. The main mechanism for regulating pesticides is the registration process. *See id.* § 136a(a). Before any pesticide can be used in the United States, EPA must first issue a license (called registration) that provides all the terms and conditions for its lawful sale, distribution, and use. *Id.* § 136a(c). The terms and conditions specify the exact product, as well as its approved uses (e.g., where it can be used, how it can be applied, what crops it can be sprayed on). 40 C.F.R. §§ 152.115, § 156.10.

Under FIFRA, EPA may not register a pesticide (or, as here, renew/extend a registration) unless the pesticide “will not generally cause unreasonable adverse effects on the environment” “when used in accordance with widespread and commonly recognized practice.” 7 U.S.C. § 136a(c)(5)(C), (D). FIFRA defines “unreasonable adverse effects on the environment” broadly to include “any unreasonable risk to [people] or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide.” *Id.* § 136(bb).

FIFRA applies a cost-benefit analysis “to ensure that there is no unreasonable risk created for people or the environment from a pesticide.” *Pollinator Stewardship Council v. EPA*, 806 F.3d 520, 522–23 (9th Cir. 2015). EPA may deny an application for registration when “necessary

to prevent unreasonable adverse effects on the environment.” *Id.* at 522; 7 U.S.C. § 136a(a). In applying this standard, EPA must carefully consider “every relevant factor that the [agency] can conceive into account,” including aesthetic values, wildlife hazards, and pesticide drift. S. Rep. No. 92-838, *as reprinted in* 1972 U.S.C.C.A.N. 3993, 4032–33 (emphasis added); *id.* at 3996 (explaining that “[i]f a pesticide is such that when used in accordance with its label or common practice it is injurious to man, other vertebrates, or useful plants, it cannot be registered under the Act and cannot be sold or distributed in interstate commerce.”).

## II. Standard of Review

Summary judgment is appropriate if there is no genuine issue of material fact, and the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(c); *Celotex Corp. v. Catrett*, 477 U.S. 317, 322–23 (1986). For judicial review of this federal agency action, the Administrative Procedure Act’s (APA) familiar standards of review apply.<sup>10</sup> *See, e.g., Ctr. for Biological Diversity v. EPA*, No. CV-20-00555-TUC-DCB, 2024 WL 455047, at \*5 (D. Ariz. Feb. 6, 2024) (applying APA standard to FIFRA claims “because the EPA issued the challenged registration decision without notice and comment”); *Ellis v. Housenger*, 252 F. Supp. 3d 800, 808 (N.D. Cal. 2017).

Under the APA, a court must “hold unlawful and set aside” agency decisions that are “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law,” or

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<sup>10</sup> FIFRA also provides its own standard of review for cases that proceed to direct appellate review, which requires EPA to support registrations with “substantial evidence.” 7 U.S.C. § 136n(b). Like APA review, the agency’s reasoning “must also be coherent and internally consistent.” *NRDC*, 38 F.4th 34, 44 (9th Cir. 2022). The standards are similar, and any difference between them is immaterial, as EPA’s Enlist decisions do not pass muster under either. *See, e.g., Ass’n of Data Processing Serv. Orgs. v. Bd. of Governors of the Fed. Reserve Sys.*, 745 F.2d 677, 683–84 (D.C. Cir. 1984) (Scalia, J.) (holding “there is no substantive difference between” arbitrary and capricious and substantial evidence tests).

adopted “without observance of procedure required by law.” 5 U.S.C. § 706(2); *accord* 7 U.S.C. § 136n(b) (applying similar “set aside” remedy language in FIFRA). To determine if an action is “arbitrary and capricious,” courts evaluate whether the agency “examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a ‘rational connection between the facts found and the choice made.’” *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). An action is “arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.” *Id.*

## ARGUMENT<sup>11</sup>

EPA’s Enlist registration decisions are arbitrary and capricious and contrary to FIFRA because EPA (1) understated or ignored important costs to the environment and human health; (2) overstated alleged benefits; and (3) improperly relied on ineffective mitigation. Accordingly, this Court should grant Plaintiffs’ Motion and vacate the registrations.

### I. EPA’s Costs Violations

Enlist products are highly toxic herbicides with significant adverse risks and impacts, or “costs” in the FIFRA rubric, that EPA is required to carefully evaluate alongside any purported benefits before registering. 7 U.S.C. § 136(bb) (“[U]nreasonable adverse effects on the

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<sup>11</sup> Plaintiffs have standing because the challenged registrations directly harm Plaintiffs’ recreational, aesthetic, professional, economic, environmental, personal, property, and other interests. *See* Decl. of Diane Keeney, Decl. of Robert Faux, Decl. of Kim Willis, Decl. of Martha Crouch, Decl. of Eric Pool, Decl. of Sylvia Wu, Decl. of Margaret Reeves, and Decl. of Hermila Trevino-Sauceda (filed concurrently); *see also Nat’l Family Farm Coal.*, 966 F.3d at 908–910 (Plaintiffs satisfied Article III standing requirements for FIFRA challenge to EPA’s prior registrations of Enlist).

environment” means “any unreasonable risk to man or the environment, taking into account the economic, social, and environmental *costs* and benefits of the use of any pesticide.”) (emphasis added). Here, the registered Enlist products pose several significant costs to farmers and the environment, including, most importantly, the increased spread of herbicide resistant weeds.

First, EPA failed to correctly account for the increase in use of Enlist since the last registration, which invariably limits the scope of the harms or costs caused by Enlist use that is accounted for, or in this case misconstrued. Second, EPA dramatically understated the potential for (and costs of) Enlist products exacerbating not just the proliferation of 2,4-D-resistant weeds, but weeds with *cross-resistance* to related herbicides, and a novel type of resistance to *unrelated* herbicides. Finally, in addition to the agronomic and environmental costs, EPA downplayed the costs to human health, most notably the increased risk of cancer from Enlist exposure. In each of these ways, EPA’s conclusions are arbitrary and capricious because they are contrary to the record evidence. By undervaluing the cost side of the cost-benefit analysis, EPA’s conclusion that Enlist products would not have unreasonable adverse effects was arbitrary and capricious, contrary to the record, and fails to make a “rational connection between the facts found and the choice made.” *State Farm*, 463 U.S. at 43.

#### **A. Current Usage**

EPA failed to quantify or properly evaluate the increased use of Enlist products based on data available at the time of its decision, resulting in a drastic underestimation of *all* the adverse effects of these toxic herbicides on the environment and human health. By failing to evaluate the significant and increasing amounts of Enlist products applied to crops, EPA’s entire cost-benefit analysis is skewed, and thus the crucial determination of whether Enlist poses an “unreasonable adverse effect” is at its core, fatally flawed. 7 U.S.C. § 136a(c)(5)(C).

### 1. Soybean

EPA underestimated the amount of Enlist products applied to soybeans. Instead of relying on up-to-date usage data, which was available to EPA at the time of its 2022 decision, EPA relied on the annual average acres sprayed with 2,4-D (including Enlist products and non-Enlist products) from 2015 to 2019, even though EPA knew that “adoption of Enlist products began very late in this period,” and the number of acres applied *has increased substantially* since 2019. A029 at 6 (“Future use of 2,4-D may be very different from past usage.”). Indeed, EPA’s own staff confirmed that “available market research data from 2018 and 2019 *does not* reflect the amount of Enlist products currently applied to soybean,” noting that “further adoption of the technology may continue in the future.” *Id.* at 7 (emphasis added). Nonetheless, EPA did not offer an alternative method to accurately determine the amount of Enlist applied to soybean crops from 2020-2021 and instead continued to rely exclusively on outdated data from 2018 and 2019 as representative of *current* use of Enlist products on soybean. *See id.*

Nor does EPA provide any indication of the *magnitude* of this massive increase in Enlist soybean acreage and Enlist product use in the two years leading up to its registration decision: According to Corteva, Enlist varieties comprised 35% of all U.S. soybean acreage in 2021.<sup>12</sup> Thus, by relying on use data from 2018 and 2019, before widespread adoption of Enlist products for use on Enlist-resistant soybeans, EPA dramatically underestimated the current amount of Enlist products applied to soybean crops, which renders EPA’s entire cost-benefit analysis

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<sup>12</sup> Press Release (Dec. 14, 2021), *supra* note 7 (“Enlist E3 soybeans already at approximately 35% penetration in the U.S. for 2021 — a trend we expect to continue as we progress our plans to introduce the Enlist E3 trait with our A-Series soybeans.”).

arbitrary and capricious. *See Nat'l Fam. Farm Coal. v. EPA*, 960 F.3d 1120, 1136 (9th Cir. 2020) (EPA violated FIFRA by underestimating the amount of dicamba applied).

## 2. Cotton

Similarly, EPA underestimated Enlist usage and acreage in cotton by failing to consider the most recent, available data. According to EPA, the “available market research data from 2018 and 2019 is a reasonable estimate of the amount of Enlist products currently applied.”

A029 at 5. However, the record actually shows that the use of Enlist products on cotton crops

[REDACTED]

[REDACTED]

[REDACTED] Yet, notwithstanding this sharp increase, EPA based its decision on cotton acreage treated with Enlist products in 2018 and 2019, rather than consult data for 2020 and 2021. Thus, because EPA failed to justify its decision to rely on data from 2018 and 2019 as a proxy for current use when data for 2020 and 2021 was available, EPA’s decision is arbitrary and capricious, in violation of FIFRA. *See, e.g., Ctr. for Biological Diversity v. EPA*, 141 F.4th 153, 173 (D.C. Cir. 2025) (EPA’s “inconsistent use of the data,” adopting estimates from “dated” study, was arbitrary and capricious); *Wilderness Soc’y v. DOI*, No. 22-CV-1871 (CRC), 2024 WL 1241906, at \*17 (D.D.C. Mar. 22, 2024) (agency’s reliance on “prior analysis” was arbitrary and capricious because agency failed to “grapple[] with the new developments” or “explain[] how past predictions square with new data”).

### B. Future Use & Acreage

Moreover, EPA failed to fully consider or quantify *future* use of Enlist products, despite record evidence confirming that use of Enlist products has increased dramatically since it has been rolled out and “continues to increase.” EPA\_0000021. Although EPA acknowledged that

the amount of 2,4-D applied has increased in recent years—and will continue to increase as a result of the challenged approvals—EPA did not attempt to estimate the amount of Enlist products that will be applied in future growing seasons as a result of its decision to extend the registrations for Enlist One and Enlist Duo for an additional *seven*-year period. At the time of its decision, EPA could have estimated future use based on the amount of Enlist applied to crops in 2020, or the number of Enlist-resistant crops sold or planted in 2021, but instead it used use denominators in its acreage calculations that it knew were gross underestimates.

In a factually similar case challenging EPA’s registration of dicamba, the Ninth Circuit held that EPA violated FIFRA by “understat[ing] the [dicamba-tolerant] seed acreage that had been planted in 2018, and therefore the amount of dicamba herbicide that had been applied to post-emergent crops that year.” *Nat’l Family Farm Coal.*, 960 F.3d at 1136. There, EPA improperly relied on a Monsanto prediction that 40 million acres of its [dicamba-tolerant] soybeans would be planted in 2018 because “EPA’s decision document was signed on October 31, at the end of the growing season,” and “EPA was in a position to know the actual acreage of [dicamba-tolerant] seeds that had been planted.” *Id.*

Here, EPA failed to even consider the number of acres that had been planted with Enlist-tolerant or 2,4-D-tolerant crops in 2020 or 2021, even though this information was available to the agency at the time it granted the challenged registrations in 2022. *See Sierra Club v. FERC*, 867 F.3d 1357, 1374 (D.C. Cir. 2017) (holding that an agency was required to make “educated assumptions” in quantifying climate emissions, where the agency possessed information allowing for reasonable forecasting). Thus, by failing to consider the rapid expansion of Enlist products and commensurate future increases in Enlist use, EPA underestimated the costs of its decisions, rendering its entire cost-benefit analysis arbitrary and capricious.

Accordingly, EPA failed to articulate a “rational connection between the facts found and the choice made” to use outdated use data and flawed estimates of future use, which renders its cost-benefit analysis arbitrary. *State Farm*, 463 U.S. at 43 (internal quotation marks omitted).

### C. Herbicide Resistance

EPA nowhere accounts for the externalized *costs* of increased weed resistance from increased use of Enlist products, such as increased weed control costs, increased amounts of 2,4-D and other herbicides that must be applied to crops to compensate for decreased efficacy, and increased harm to wildlife and their habitats. EPA acknowledged “repeated use of Enlist . . . promote[s] resistance to 2,4-D, as well as cross resistance to dicamba and other synthetic auxin [] herbicides,” and “[t]hese costs affect not only the user of Enlist 2,4-D, but also other users of synthetic auxin herbicides which are less effective due to resistance.” A028 at 2. But EPA’s “analysis” starts and ends there. EPA recognized that resistance is a cost but failed to actually specify or evaluate any of the costs *of* Enlist-induced weed resistance, such as increased weed control costs, decreased yields, increased use of pesticides, and increased runoff and spray drift damage. *See* D085 at 3-4; EPA\_0003219 [REDACTED]

[REDACTED] Merely naming a cost is not sufficient to withstand arbitrary and capricious review, nor to comply with EPA’s FIFRA mandates that it actually *assess* costs.

Nor did EPA attempt to estimate or quantify any of the costs to farmers, such as increased weed control costs and reduced yields for farmers. *See Nat’l Family Farm Coal.*, 960 F.3d at 1144 (EPA violated FIFRA by failing to consider economic costs to farmers). As the record shows, Enlist-induced weed resistance can have widespread effects on both Enlist users and non-Enlist users. *See* A028 at 2; EPA\_0003222 [REDACTED]

[REDACTED] The costs of this resistance cannot be

expressed as merely a “reduced benefit” for non-Enlist users; they are significant costs imposed on them by EPA’s decision to renew the registrations for Enlist One and Enlist Duo.

Accordingly, by failing to specify or weigh any of the costs associated with Enlist-induced weed resistance, EPA’s cost assessment is arbitrary and capricious.

2,4-D Resistance: EPA failed to quantify or consider how its decisions will increase 2,4-D resistance. Relative to other forms of 2,4-D, Enlist products *accelerate* the development of weed resistance because they are overwhelmingly applied after crop emergence (their exact purpose). *See* A029 at 5-6. EPA acknowledged that extending the registrations for Enlist One and Enlist Duo “would substantially increase the amount of 2,4-D applied and the number of acres sprayed with 2,4-D *after crop emergence*.” A028 at 9 (emphasis added). EPA further acknowledged that “[i]ncreased use of Enlist 2,4-D, *especially after crop emergence*, will increase selection pressure on 2,4-D and other synthetic auxin herbicides,” which would “promote resistance to 2,4-D.” *Id.* (emphasis added).

However, EPA did not then estimate, quantify, or even consider how the increased use of Enlist products will in turn increase the spread of 2,4-D resistance, despite evidence that Enlist products have been applied “after crop emergence” on *90% and 80%* of Enlist-treated cotton and soybean acres, respectively, A029 at 5-6, and users will likely continue to apply Enlist products “after crop emergence” at increased rates as a result of EPA’s registration decisions. *See, e.g., id.* at 13 (“BEAD expects that instances of 2,4-D resistance associated with the use of Enlist herbicides have already occurred and expects confirmed 2,4-D resistance incidents associated with the use of Enlist herbicides to increase in the future.”). Again, mere acknowledgment does not fulfill EPA’s risk assessment duties under FIFRA to actually assess, evaluate, and weigh these significant costs.

Nor did EPA quantify or weigh any of the costs associated with the spread of 2,4-D resistance from increased use of Enlist products on postemergence crops. By ignoring these costs, EPA's cost-benefit analysis is skewed because increased resistance threatens to increase weed control costs for farmers, 2,4-D spray drift damage, runoff damage to off-field wildlife, and other environmental impacts. Thus, by failing to estimate future increases in 2,4-D resistance and the associated effects of such resistance, EPA's entire cost-benefit analysis is arbitrary and capricious, in violation of FIFRA. *See WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 67–71 (D.D.C. 2019) (agency's failure to quantify reasonably foreseeable climate effects of oil and gas development was arbitrary and capricious).

EPA's benefits conclusion also conflicts with evidence that “*any* resistance to 2,4-D, whether associated with the Enlist herbicides or not, will potentially lower the benefits of the Enlist herbicides.” A029 at 12 (emphasis added). At the time of EPA's challenged decisions, there were several confirmed cases of 2,4-D resistant weeds in areas approved for use of Enlist One and Enlist Duo, *see* EPA\_0003211-12, and state extension agencies had already received reports of weeds with resistance to Enlist products before EPA decided to renew the registrations for these products. *See, e.g.*, EPA\_0018112 (email from EPA to Corteva linking several articles with “documentation of 2,4-D/dicamba resistant Palmer amaranth”). Without full consideration of 2,4-D resistance, EPA simply cannot properly analyze the costs and benefits of the challenged registration decisions or decide how to mitigate their unreasonable effects. Thus, by failing to fully consider confirmed cases of 2,4-D resistance, EPA underestimated the costs associated with increased resistance to Enlist products. Therefore, because EPA significantly understated the costs of 2,4-D resistance, EPA's decision is arbitrary and capricious, in violation of FIFRA.

Cross Resistance: EPA failed to quantify or fully evaluate how the increased use of Enlist products will increase cross-resistance to dicamba and other herbicides. As explained above, while most herbicides foster evolution of weeds resistant only to the herbicide that is applied, 2,4-D induces resistance *not only to itself, but also cross-resistance to related auxin herbicides* like dicamba. *See* A029 at 12. Repeating the same “acknowledge-but-do-not-actually-assess” theme, EPA acknowledged that the “[i]ncreased use of Enlist 2,4-D, especially after crop emergence,” would “promote . . . cross resistance to dicamba and other synthetic auxin (WSSA Group 4) herbicides,” A028 at 2, 19, but then completely failed to quantify *how* the increased use of Enlist products will increase cross-resistance to dicamba and other herbicides as a result of its registration decisions. Nor did EPA specify, let alone assess, any of the costs associated with cross resistance, such as reduced efficacy of other herbicides and increased weed control costs for non-Enlist users. EPA also acknowledged that 2,4-D resistance can “reduce its efficacy for weed control in other crops as well,” A028 at 9, but entirely failed to evaluate reduced efficacy as a cost associated with Enlist use. Moreover, EPA acknowledged that 2,4-D resistance harms “not only the user of Enlist 2,4-D, but also other users of synthetic auxin herbicides which are less effective due to resistance,” *id.* at 2, 19, but failed to evaluate the costs to non-Enlist farmers due to the increased spread of Enlist-induced resistance. *See id.* Because EPA failed to consider how its decision increases resistance to dicamba and other herbicides and the costs of this resistance, EPA’s cost-benefit analysis is arbitrary and capricious.

Metabolic Resistance: EPA also failed to quantify and fully evaluate how the increased use of Enlist products will increase metabolic resistance. EPA rightly regards this form of multiple resistance as “highly concerning” because it poses a “serious threat” of rendering the most problematic weeds—which are already resistant to glyphosate and often to other types of

weedkillers—*additionally* immune to 2,4-D and many other herbicides. A029 at 11-12.

Metabolic resistance also confers *immediate* resistance, leading to “herbicide failures the first time they are used” versus the “multiple generations” it takes for target-site resistance to evolve. D085 at 3. As Enlist use rises, the logical result could well be rapidly growing populations of intractable weeds that few if any herbicides can kill. If weeds resistant to glyphosate already cost farmers *billions* to control, *see id.* at 3-4, then it is obvious that the far more serious multiple-resistance that Enlist products can trigger will increase farmers’ weed control costs, forcing farmers to use more and more pesticides to control the spread of problematic superweeds.

Weed resistance involves not only increased *economic* costs to farmers, it also imposes environmental and social costs that EPA failed to evaluate in its cost analysis. Farmers respond to weed resistance primarily by increasing the rates and number of applications of the herbicide to which the weeds are evolving resistance, and by applying *additional* herbicides to which the weeds are not yet resistant. This in turn increases “pesticide environmental loading” and the adverse effects on plants and wildlife that such loading entails. D075 at 9. Thus, Enlist-induced weed resistance will inevitably lead to the increased use of Enlist and other herbicides against superweeds, and in turn, more spray and vapor drift damage to neighboring crops. Such drift damage generates social strife in rural communities, a social cost of weed resistance that EPA has also failed to assess. EPA’s failure to consider these costs is thus arbitrary and capricious. *See Nat’l Fam. Farm Coal.*, 960 F.3d at 1124–25 (dicamba registration was arbitrary and capricious because “EPA entirely failed to acknowledge the risk that [over-the-top] dicamba use would tear the social fabric of farming communities.”).

## **D. Human Health**

EPA's decision to extend the Enlist registrations was also arbitrary and capricious because it understated the costs or risks to human health. Again, by understating and/or ignoring health costs from these registrations, EPA's cost-benefit analysis is skewed, rendering the crucial determination of whether Enlist poses an "unreasonable adverse effect" fatally flawed. 7 U.S.C. § 136a(c)(5)(C). Both 2,4-D and glyphosate have associated health risks that EPA has previously understated or ignored: EPA has since doubled down on those mistakes in its 2022 registration decisions. First, as to glyphosate, EPA relied on a human health risk assessment that a sister court has already held was unlawful because it discounted both animal studies and epidemiological data showing an increased risk of non-Hodgkin lymphoma (NHL) with glyphosate exposure. Second, as to 2,4-D, EPA similarly discounted cancer risks, including the risk of the same cancer (NHL). Because EPA understated the cost side of the cost-benefit equation with respect to human health, EPA's Enlist registrations are arbitrary and capricious.

### ***1. Glyphosate***

In renewing the Enlist registrations, EPA relied on an erroneous past assessment for its human health evaluation, namely its 2017 Glyphosate Draft Human Health Risk Assessment in Support of Registration Review. A021 at 7-8; EPA\_0122067. That assessment was prepared during EPA's long overdue registration review process for all products containing glyphosate, that ran from 2009-2020, which Congress requires EPA to complete every 15 years. 7 U.S.C. § 136a(g)(1)(A). Despite starting in 2009, EPA took until 2020 to issue its "interim" registration review decision for glyphosate, which is a misnomer for these purposes, because EPA stated that the 2020 registration review decision was its final human health decision<sup>13</sup> and accompanying

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<sup>13</sup> EPA's 2020 glyphosate registration review decision was final in all respects except three discrete duties it said it still had to complete. *NRDC*, 38 F.4th at 43-44.

risk assessment from glyphosate. [REDACTED]

[REDACTED]

That 2020 registration review decision was vacated as to the human health conclusion, *see NRDC*, 38 F.4th at 45-52, and EPA later fully withdrew the rest of the registration review decision. To this day, EPA has not yet completed its registration review process for glyphosate, nor has it redone its erroneous 2017 human health risk assessment on which its vacated registration review was based.<sup>14</sup> Instead, the last legally operative review of glyphosate and all its products was completed all the way back in 1993 (reregistration), over three decades ago.<sup>15</sup>

Several of the same Plaintiffs here challenged EPA's 2020 registration review decision that finalized EPA's human health and cancer assessments and determinations for glyphosate, and the Ninth Circuit vacated the human health portion of EPA's Interim Decision. *NRDC*, 38 F.4th at 51-52 (holding EPA's conclusion that glyphosate is not likely to cause cancer was "not supported by substantial evidence" and vacating based on the seriousness of EPA's errors in assessing the human health risks). This judicial order vacating "the human-health portion of EPA's Interim Decision," *id.*, means EPA's 2020 conclusions, as to the carcinogenicity of glyphosate, are legally insufficient and "cannot survive substantial-evidence review." *Id.* Indeed, EPA itself withdrew the entire glyphosate interim decision in September 2022.

In *NRDC*, the Ninth Circuit exhaustively examined EPA's 2017 human health risk assessment as to glyphosate's carcinogenicity, the very same human health risk assessment that EPA relied upon for its 2022 renewal of Enlist Duo. *See* 38 F.4th at 45-51; A021 at 7-8. In

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<sup>14</sup> *Upcoming Registration Review Actions*, EPA, <https://www.epa.gov/pesticide-reevaluation/upcoming-registration-review-actions> (glyphosate listed for review in 2026).

<sup>15</sup> *See* EPA, REREGISTRATION ELIGIBILITY DECISION: GLYPHOSATE (1993), [https://www3.epa.gov/pesticides/chem\\_search/reg\\_actions/reregistration/red\\_PC-417300\\_1-Sep-93.pdf](https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_PC-417300_1-Sep-93.pdf).

*NRDC*, the court concluded that EPA’s “no risks to human health” conclusion for glyphosate, resting “in important part” on EPA’s “not likely to be carcinogenic” conclusion, contravened EPA’s own Cancer Guidelines (H-0273),<sup>16</sup> and ignored evidence of increased risk of NHL. *See* 38 F.4th at 45-51.

In a careful, detailed treatment, supported by factual findings, the court held that EPA’s risk assessment was flawed and contrary to law no less than five ways. First, EPA’s “not likely” conclusion conflicted with its determination elsewhere that “glyphosate exposure and risk of NHL cannot be determined based on the available evidence.” *Id.* at 46. Second, EPA’s reliance on historical-control data for tumors observed was improperly one-sided. *Id.* at 47-48. Third, EPA’s reliance on pairwise statistical significance was similarly improper because it did not consider trend tests with them as required. *Id.* at 48-49. Fourth, EPA’s disregard of high dose study results was contrary to the Cancer Guidelines and the basic purpose of a hazard assessment and the Step 1 determination. *Id.* at 50. And fifth, EPA’s reliance on a self-created “limit dose” concept was contrary to its guidelines for health effects tests. *Id.* at 51.

As to the first flaw in EPA’s human health risk assessment of glyphosate, EPA relied on its 2017 Revised Glyphosate Issue Paper: Evaluation of Carcinogenic Potential (“Cancer Paper”),<sup>17</sup> which the court held “contravened [its own] Cancer Guidelines it purported to follow.” *Id.* at 45. Specifically, in the Cancer Paper, EPA concluded that “the association between glyphosate exposure and risk of NHL *cannot be determined* based on the available evidence.” *Id.* (emphasis added). However, the Cancer Paper acknowledged that “some

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<sup>16</sup> EPA, GUIDELINES FOR CARCINOGEN RISK ASSESSMENT (2005), [https://www.epa.gov/sites/default/files/2013-09/documents/cancer\\_guidelines\\_final\\_3-25-05.pdf](https://www.epa.gov/sites/default/files/2013-09/documents/cancer_guidelines_final_3-25-05.pdf).

<sup>17</sup> EPA’s Cancer Paper is available at <https://www.regulations.gov/document/EPA-HQ-OPP-2016-0385-0528>.

epidemiological studies . . . provide evidence of an exposure-response relationship between glyphosate and NHL.” *Id.* Despite EPA (improperly) discounting these studies—ostensibly to avoid a conclusive determination on glyphosate’s potential to cause NHL—the court held that EPA “cannot reasonably treat its inability to reach a conclusion about NHL risk as consistent with a conclusion that glyphosate is ‘not likely’ to cause cancer within the meaning of the Cancer Guidelines.” *Id.* at 46-47.

As to the other held errors, the Ninth Circuit reviewed EPA’s two main rationales for finding glyphosate “not likely” to cause cancer, ultimately concluding that “neither withstands scrutiny under the agency’s own framework.” *Id.* at 47. First, EPA discounted all tumors observed in animal studies as not being related to glyphosate, by tipping the scales in favor of the pesticide for interpretative indicia. *Id.* The court held that EPA’s risk assessment and conclusions conflicted with its own Cancer Guidelines it claimed to follow. *See id.* at 47-49. Second, EPA discounted animal studies showing these tumors by claiming that the tumor results occurred only at “the highest doses” and were thus “not relevant to human health risk assessment based on the currently registered use pattern.” *Id.* at 49. Again, the court held that EPA’s conclusion conflicted with its Cancer Guidelines, and that it was “contrary to the ‘purpose’ of a hazard assessment” which is to first identify carcinogenic effects and mode of action so that later steps can compare to human patterns of pesticide exposure. *Id.* at 50, 51 (also noting that the congressionally created Scientific Advisory Panel (SAP) expressed concern about EPA’s discounting of study results involving high doses, stating it is not how rodent studies are normally interpreted, but “EPA declined to change its approach.”).

The court also identified where, in 2015 and 2016, both the agency’s expert SAP and its Office of Research and Development (ORD) raised many of these same concerns regarding the

fundamental risk assessment errors, which EPA ignored. *See id.* at 41-42. Even in the glyphosate final human health risk assessments and registration review decision, EPA *still* did not address these concerns. *Id.* at 42 (noting that “ORD’s criticisms did not change EPA’s overall ‘not likely’ determination”), 47 (regarding use of selective historical-control data “in a manner inconsistent with the Cancer Guidelines”), 51 (explaining SAP’s concern regarding “improperly discounted study results”). The court did not mince words in describing EPA’s violations and errors, such as its “flawed use,” *id.* at 47 n.7, of data used “selectively” *id.* at 47, its “bare assertion,” that “fails to account coherently for the evidence,” *id.* at 49, its “disregarding [of] results,” *id.* at 50, and its “unsupported” reliance, *id.* at 51, and “inconsistent” reasoning. *Id.* at 46, 47, & 48.

The Ninth Circuit not only picked-apart the arbitrariness of EPA’s glyphosate human health risk conclusions, but vacated those conclusions, on which the 2022 Enlist Duo registration relies. *See id.* at 52. Accordingly, glyphosate’s current registrations rely on the last legally operative assessment, the 1993 Reregistration Eligibility Decision (RED). This decision was based on a human health risk assessment conducted over *thirty years* ago and—in addition to having its own critical flaws—fails to account for the 10-fold increase in glyphosate use driven largely by over-the-top applications of glyphosate to crops genetically engineered to resist it. *Id.* at 41 (glyphosate use “skyrocketed” as a result of Monsanto’s “Roundup Ready” crop system).<sup>18</sup>

Not only has the use pattern drastically changed since 1993, *id.* at 46, the science on human health impacts from glyphosate has also drastically improved, with overwhelming evidence showing the connection specifically between glyphosate exposure and NHL, including

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<sup>18</sup> Indeed, for this very reason, many plaintiffs in this case petitioned EPA in 2023 to cancel all registrations of glyphosate products. *See* CFS et al., Petition to Cancel All Registrations of Glyphosate Herbicide (Dec. 13, 2023), [https://www.centerforfoodsafety.org/files/12-13-23\\_glycancelpet\\_final\\_85692.pdf](https://www.centerforfoodsafety.org/files/12-13-23_glycancelpet_final_85692.pdf).

the IARC 2015 classification of glyphosate as “probably carcinogenic to humans.”<sup>19</sup> Numerous courts have found that glyphosate-containing Roundup was a substantial factor in causing users’ cancer.<sup>20</sup> Given these profound changes, the 1993 decision cannot—factually, legally, or scientifically—justify the registration of glyphosate as it is used today. Not only was it made in ignorance of the extensive scientific literature on glyphosate’s risks that have accumulated over the last three decades, but it was also completed when exposure to glyphosate was a small fraction of what it is today.

Indeed, in the prior Enlist litigation in 2020, the Ninth Circuit stated that any concerns over “new data about glyphosate” in future registrations must be considered by EPA, and EPA could cancel the Enlist registration if unreasonable adverse effects were shown. *Nat’l Fam. Farm Coal.*, 966 F.3d at 918. If EPA failed to do so, “the ‘registration review’ process serves as a

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<sup>19</sup> IARC MONOGRAPHS, *Some Organophosphate Insecticides & Herbicides: Tetrachlorvinphos, Parathion, Malathion, Diazinon & Glyphosate*, 112 IARC PUBL’N 1, 398 (Jan. 26, 2017), <https://publications.iarc.who.int/549>.

<sup>20</sup> See, e.g., *Hardeman v. Monsanto Co.*, No. 3:16-00525-VC (N.D. Cal. 2019) (jury finding Hardeman’s exposure to Roundup was substantial factor in his NHL); *Hardeman v. Monsanto Co.*, 997 F.3d 941 (9th Cir. 2021), *cert. denied*, 213 L. Ed. 2d 1064, 142 S. Ct. 2834 (2022) (affirming district court’s finding of liability); *Johnson v. Monsanto Co.*, No. CGC-16-550128, 2018 WL 4261442 (Cal. Super. Ct. 2018) (jury finding Johnson’s exposure to Roundup was a substantial contributing factor to his cancer); *Johnson v. Monsanto Co.*, 266 Cal.Rptr.3d 111, 136 (Ct. App. 2020) (affirming trial court’s finding of liability); *Pilliod v. Monsanto Co.*, No. RG17862702, JCCP No. 4953 (Cal. Super. Ct. 2019) (similar finding and court also held that jury could infer not only cancer risk but also Monsanto’s decades of suppression of knowledge of the risk); *Pilliod v. Monsanto Co.*, 67 Cal. App. 5th 591 (2021) (affirming trial court’s ruling), *reh’g denied* (Aug. 25, 2021), *rev. denied* (Nov. 17, 2021), *cert. denied*, 142 S. Ct. 2870, 213 L. Ed. 2d 1092 (2022). These cases are nowhere near over, even after a massive settlement of approximately 80% of all Roundup claims (or about 100,000 lawsuits), as more than 40,000 remain to be tried or settled, and several hundred new cases are expected annually given the tens of thousands of new NHL diagnoses each year. Ronald V. Millier, *Monsanto Roundup Lawsuit Update*, LAWSUIT INFORMATION CENTER (Aug. 19, 2025), <https://www.lawsuit-information-center.com/roundup-mdl-judge-question-10-billion-settlement-proposal.html>. Notably, these lawsuits have not included farmworkers, leaving open another huge class of potential claimants.

backstop to ensure that pesticides do not remain registered once new data has shown them to be harmful to humans or the environment.” *Id.* Since then, the Ninth Circuit has found EPA’s glyphosate human health risk assessment to be fatally flawed. *NRDC*, 38 F.4th at 51-52. Clearly, the promise of registration review serving as a “backstop” to prevent continued registration of a pesticide like Enlist Duo has not been enough, despite all the new information about glyphosate’s harms.

Here, the fatal flaws the Ninth Circuit identified are the *same*, and EPA simply cannot rely on the outdated 1993 or the invalidated 2017 human health risk assessments to support its 2022 Enlist registration decision; either would be quintessentially arbitrary and capricious. *See* A021 at 8 (citing 2017 human health risk assessment for registration review). Given the Ninth Circuit’s detailed review and holding that EPA’s “not likely” to cause cancer conclusion (and thus its “no risk to human health” overall conclusion) for glyphosate was contrary to its own Guidelines, logic, and FIFRA, this Court should similarly find that EPA’s 2022 Enlist decisions are arbitrary and capricious.

**2. 2,4-D**

The 2,4-D in Enlist products also poses health risks that EPA ignored or understated, contrary to the evidence before it and EPA’s own guidelines. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]<sup>21</sup>

However, EPA actually has ample animal and epidemiological evidence demonstrating that 2,4-D can cause cancer: crucially, the same evidence EPA relies upon to assess a pesticide's carcinogenicity.<sup>22</sup> [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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<sup>21</sup> EPA, GUIDELINES FOR CARCINOGEN RISK ASSESSMENT, 8, 21 (Sep. 24, 1986), [https://archive.epa.gov/raf/web/pdf/ca\\_guidelines\\_1986.pdf](https://archive.epa.gov/raf/web/pdf/ca_guidelines_1986.pdf) [hereinafter 1986 Guidelines].

<sup>22</sup> *Id.* at 8 (“Evidence of possible carcinogenicity in humans comes primarily from two sources: long-term animal tests and epidemiological investigations.”).

<sup>23</sup> [REDACTED]

<sup>24</sup> [REDACTED]

<sup>25</sup> [REDACTED]

[REDACTED]

Even as EPA’s Enlist herbicide approvals are triggering unprecedentedly high use of, and exposure to, 2,4-D, [REDACTED]

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<sup>26</sup> [REDACTED]

<sup>27</sup> 1986 Guidelines, *supra* note 21 at 20; [REDACTED]

[REDACTED]

[REDACTED] See [REDACTED].

And even though both components of Enlist Duo are implicated in causing the *same* cancer in humans—NHL—EPA refused to assess whether the *combination* can cause cancer or have any other chronic health impact.<sup>28</sup> EPA’s conclusion is contrary to evidence in the record and to its own cancer guidelines, just as EPA’s glyphosate risk assessment violated its 2005 guidelines, making its decision quintessentially arbitrary and capricious. *See NRDC*, 38 F.4th at 51 (EPA’s choice of cancer classification failed to abide by its guidelines); *Sierra Club v. EPA*, 719 F.2d 436, 459 (D.C. Cir. 1983) (inconsistent reasoning is “the hallmark of arbitrary action”); *Animal Legal Def. Fund, Inc. v. Perdue*, 872 F.3d 602, 619 (D.C. Cir. 2017) (agency explanation running counter to evidence before it is the essence of arbitrary and capricious decision making).

## **II. EPA’s Benefits Violations**

On the benefits side of the cost-benefit analysis, EPA put a thumb on the scale of Enlist’s benefits, contrary to the record evidence. EPA overstated the effectiveness of Enlist products against multiple-herbicide-resistant weeds because EPA failed to properly assess current use of Enlist products on resistant weeds and the increased risk of future resistance. EPA also misdefined the baseline of the benefits assessment of Enlist products by comparing it to another controversial (and twice court-vacated) pesticide: dicamba. Therefore, EPA’s conclusion that the benefits of Enlist outweigh its significant costs is arbitrary and capricious, in violation of FIFRA.

### **A. EPA Overstated the Benefits of Enlist Against Herbicide-Resistant Weeds.**

EPA erroneously tipped the scales by overstating the benefits of Enlist products as an effective tool for postemergence control of problematic herbicide-resistant broadleaf weeds, like

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<sup>28</sup> *See* D065 at 2 (EPA’s 2017 assessment of Enlist Duo limited to 2,4-D component).

Palmer amaranth in soybean and cotton. This is the other side of the herbicide resistance coin: as the record shows, what EPA erroneously called a “benefit” will instead be a predictable cost.

In its reregistration decision, EPA claimed that use of the “Enlist weed control system, *coupled with best management practices* for herbicide resistance management can significantly help limit the further development of weed resistance.” A021 at 23–24; *see also* A029 at 9. However, despite labeling language encouraging growers to use Enlist products with other modes of action to prevent the spread of herbicide resistance, the record shows that most growers use Enlist products as their *only* mode of action against glyphosate-resistant weeds, A029 at 6-7, thereby increasing herbicide selection pressure and the spread of 2,4-D resistance. A028 at 9-10; *see also* EPA\_0003226 [REDACTED]

[REDACTED] Because only the 2,4-D component of Enlist products is effective against glyphosate-resistant weeds, weeds resistant to 2,4-D (as well as dicamba and other herbicides via metabolic resistance) will rapidly emerge if users continue to use Enlist products as their only mode of action against glyphosate-resistant weeds.

Worse yet, a significant percentage of cotton acres are treated *twice* with Enlist products after crop emergence, further escalating selection pressure for resistance. *See* A029 at 5. Thus, EPA’s claim that Enlist helps limit the spread of weed resistance is directly contradicted by evidence in the record showing that most growers use Enlist products in ways that *promote*, rather than limit, weed resistance, in violation of FIFRA. *See Migrant Clinicians Network v. EPA*, 88 F.4th 830, 847 (9th Cir. 2023) (EPA violated FIFRA by concluding that streptomycin could be used to prevent disease without providing sufficient support for that conclusion).

In its Decision Memo, EPA broadly concluded that Enlist One (which only contains 2,4-D) provides “greater flexibility for users as it can be tank-mixed with other herbicides, especially

glufosinate.” A021 at 22. But these purported benefits are directly refuted by record evidence showing that most growers do *not* apply Enlist One with other herbicides. As for glufosinate, although “the combination of Enlist One . . . tank mixed with glufosinate [is] the best combination to control Palmer amaranth,” “this combination is rarely utilized by users.” A029 at 12. Nor do most growers apply Enlist One with any other effective herbicides. Although Enlist seeds are resistant to multiple modes of action, “growers are [not] actually applying herbicides containing those modes of action to their fields, as evidenced by the vast majority of growers in both soybean and cotton relying solely on 2,4-D for control of problematic *Amaranthus* species.” A029 at 12.

Thus, because actual use data demonstrates that farmers do *not use* Enlist One with other effective modes of action to control glyphosate-resistant weeds, the use of Enlist One threatens to *increase* the spread of herbicide-resistant weeds and make it more difficult for users to control these weeds in future growing seasons. *See supra*. Accordingly, EPA’s conclusion that Enlist One will help slow the spread of herbicide resistant weeds “runs counter to the evidence” before it, rendering EPA’s entire cost-benefit analysis arbitrary and capricious, in violation of FIFRA. *State Farm*, 463 U.S. at 43.

Likewise, EPA broadly concluded that “[w]here glyphosate-resistant weeds are present, the 2,4-D component of Enlist Duo will provide an effective mode of action for control of glyphosate-resistant weeds.” A021 at 22. However, the actual record shows that most users apply Enlist Duo alone, *e.g.*, A029 at 6-7, which threatens to increase the spread of 2,4-D resistance (as well as resistance to dicamba and other herbicides via metabolic resistance). *See supra*. Thus, EPA’s claim that Enlist Duo will help slow the spread of herbicide resistant weeds is also arbitrary and capricious, in violation of FIFRA.

**B. EPA Overstated the Benefits of Enlist Against Alternatives.**

**1. Dicamba**

In addition, EPA claimed a benefit from Enlist's registration by comparing it to previously registered dicamba-resistant crop systems. Specifically, as part of its baseline for its Enlist cost-benefit analysis, EPA reasoned that Enlist has the potential to reduce the amount of "acres of soybean and cotton sprayed with over-the-top dicamba applications," and in turn, reduce the "off-target movement that have been associated with over-the-top dicamba uses in soybean and cotton." A029 at 9-10.

"Off-target movement" is EPA's euphemism for pesticide drift harm to other crop fields and the environment. As discussed above, EPA's approval of the extremely volatile dicamba for "over-the-top" spraying of commodity crops has caused unprecedented levels of drift harm to farmers and led to courts twice now vacating EPA's registrations of it, in 2020 and again in 2024. *See Ctr. for Biological Diversity*, 2024 WL 455047, at \*25; *Nat'l Fam. Farm Coal.*, 960 F.3d at 1145. The 2020 dicamba decision set forth detailed factual findings of the drift harm and held that EPA had violated FIFRA no less than six different ways in approving it. *Nat'l Fam. Farm Coal.*, 960 F.3d at 1124, 1145. Yet EPA re-approved it just a few months later without addressing any of these violations, leading to a second round of litigation and eventual second decision vacating it. *See Ctr. for Biological Diversity*, 2024 WL 455047, at \*25. During the middle of the second litigation, in December 2021, EPA issued a damning report of drift damage episodes, *see* D042, but still did not revoke the registration until ordered by the court. Thus, dicamba is currently unlawful to use.

As a matter of sound risk assessment procedure and non-arbitrary and capricious agency rulemaking, EPA cannot bootstrap Enlist products as a “benefit” by skewing the evidence to portray Enlist products as a lesser evil than dicamba when the adverse effects of dicamba are a direct consequence of EPA’s own failure to regulate dicamba products. EPA itself is responsible for approving dicamba and ensuring that dicamba-based products do not cause unreasonable adverse risks to the environment, which it has failed to do. Taken to its logical extreme, EPA’s improper approach has no logical stopping point: EPA could continue to approve worse and worse pesticides and then use these approvals as justification for approving a slightly less harmful pesticide as a lesser evil. It would be akin to a building inspector approving a structure with foundation cracks because it’s more stable than a condemned building they previously approved: the comparison does not change the inherent danger of less harmful alternative; it is still unsafe, and people will suffer.

As such, EPA acted arbitrarily and capriciously by using dicamba as the baseline for evaluating the purported benefits of Enlist products. *See Marin Audubon Soc’y v. Fed. Aviation Admin.*, 121 F.4th 902, 917 (D.C. Cir. 2024) (agencies acted arbitrarily by using the existing level of flights under interim operating authority as the baseline for assessing environmental effects); *N.C. Wildlife Fed’n v. N.C. Dep’t of Transp.*, 677 F.3d 596, 603 (4th Cir. 2012) (“Without accurate baseline data, an agency cannot carefully consider information about significant environment impacts[,] resulting in an arbitrary and capricious decision.”) (original alterations and citation omitted).

EPA’s conclusion regarding dicamba is also arbitrary and capricious because EPA improperly assumed that growers who do not currently use dicamba will automatically switch to dicamba if EPA does not approve Enlist. *See* A029 at 8-10. Moreover, because growers have

several weed management options (chemical and non-chemical alike) other than dicamba to manage problematic weeds in soybean and cotton, EPA lacks support for its “substitution assumption” that growers would switch to dicamba in the absence of Enlist. *See NRDC v. EPA*, 857 F.3d 1030, 1039 (9th Cir. 2017) (EPA improperly assumed that “current users of conventional-silver pesticides will replace those pesticides with [the approved chemical]”). If Enlist products replace systems with *less* off-target movement than 2,4-D or dicamba, EPA’s decision would result in *more* overall drift and volatility risks. Because EPA entirely ignored the risk of Enlist products replacing weed control systems with *fewer* adverse effects than 2,4-D, EPA’s decision is arbitrary and capricious.

Finally, the record demonstrates that Enlist products pose the same—and in some cases, greater—risks than dicamba when controlling for the delays in commercialization and crop type. Comparing these two pesticides is arbitrary, as stated above, but even in comparing Enlist products to dicamba, EPA still failed to accurately compare the risk of injury from Enlist products to 2,4-D-sensitive crops, such as cotton. As state extension scientists warned, “[a]lthough Enlist may be less volatile than dicamba formulations we know that non-tolerant cotton is very sensitive and will likely show injury if Enlist is sprayed on a large scale in the area.” EPA\_0023326. By mid-summer 2021, 2,4-D injury reports exceeded dicamba injury reports in Indiana. D046. According to a Texas farmer with 70 acres of 2,4-D-damaged cotton: “You know how sensitive soybeans are to dicamba -- well cotton is similarly sensitive to 2,4-D.” *Id.* Likewise, in Texas, the nation’s leading cotton state, [REDACTED]

[REDACTED]

[REDACTED] EPA\_0003144-45 [REDACTED]

[REDACTED]



labeling this a “benefit” ignores the very real *costs*: Enlist products threaten to injure nearby crops by increasing the number of postemergence applications. Despite this increased risk, EPA concluded that Enlist products are favorable to other 2,4-D products because “non-Enlist 2,4-D herbicides can, under certain conditions, injure non-2,4-D tolerant corn.” *Id.* This rationale is flawed because it relates foremost to the corn variety a grower chooses to grow, not Enlist 2,4-D. Moreover, while Enlist products may not damage Enlist-resistant corn, they are more likely to cause drift damage to nearby crops. Without comparing the risk of drift damage from Enlist with the alternatives, EPA cannot conclude Enlist products are less harmful to nearby crops. Thus, EPA’s conclusion regarding the benefits of Enlist products in corn is arbitrary and capricious.

### **III. EPA’s Mitigation Violations**

EPA’s labeling restrictions fail to mitigate Enlist One and Enlist Duo’s adverse effects on the environment because EPA ignored evidence that even with full compliance, the labeling restrictions actually threaten to *increase* adverse impacts, such as spray drift, runoff, and herbicide resistance. For these reasons, EPA’s registration decisions are arbitrary and capricious.

#### **A. Noncompliance with Existing Labeling Requirements**

EPA continues to unlawfully rely on label language encouraging users to apply Enlist products with other weed management systems to slow the spread of weed resistance, *see, e.g.*, A010 at 14-15 (Enlist Duo) and 30-31 (Enlist One), even though the record confirms that this language has been largely ignored by users. When EPA registered Enlist Duo in 2017, EPA included label language that instructed users to apply Enlist products with other modes of action to prevent the spread of Enlist-induced weed resistance. EPA\_0001031-32. However, market research reveals that most users ignored this label language and applied Enlist products alone, without other herbicides, A029 at 6, 7, which increases selection pressure and the spread of

herbicide resistance. *See supra*. Thus, the record confirms that growers are not complying with existing labeling language designed to prevent herbicide resistance, and EPA's continued reliance on this label language to mitigate the adverse effects of herbicide resistance is arbitrary and capricious. *See Nat'l Fam. Farm Coal.*, 960 F.3d at 1139 (EPA violated FIFRA by ignoring evidence of "a risk of substantial non-compliance with the EPA-mandated label").

### **B. Spray Drift Buffer**

Likewise, EPA continues to unlawfully rely on spray drift buffers to mitigate unreasonable adverse effects on the environment, despite evidence showing that these buffers have been ineffective. Although EPA found that Enlist products have numerous adverse effects on plants and animals, EPA concluded that the required 30-foot buffer sufficiently "reduce[s] off-field exposures so that spray drift does not pose a risk to non-target organisms." A021 at 9, 25; *see also* A018 at 71. However, this is not a new measure. All previous labels for Enlist One and Enlist Duo also required a 30-foot spray drift buffer. *See, e.g.*, EPA\_0001034 (2017 Enlist Duo label); EPA\_0000049 (2017 Enlist One label). Recent incident data confirms that these buffers have not been effective against drift damage from Enlist applications, as incidents have increased since their first use. *See* EPA\_0124286. As such, EPA's continued reliance on the 30-foot spray drift buffer is contrary to the evidence in the record and thus arbitrary and capricious. *See State Farm*, 463 U.S. at 43.

As the record shows, Enlist products have already caused spray drift damage to hundreds of acres of neighboring cotton crops. In 2018 and 2019, EPA received 16 reports of 2,4-D-related drift incidents involving Enlist One or Enlist Duo. A028 at 8. All these incidents involved significant damage to cotton fields in Texas, Oklahoma, or Mississippi. *Id.* The reported damage

to cotton crops was significant, ranging from 13 to 800 acres. *Id.*; *see also* A018 at 71.

According to EPA, this “suggest[s] that volatility-based exposure may have played a role.” *Id.*

Moreover, damage relating to Enlist applications was significantly underreported during this time span because Corteva did not launch the Enlist weed control system for soybean crops until mid-2019, and the use of Enlist products has only increased since then. *See supra*.

Thus, data from the first couple years of Enlist usage confirms that spray drift damage has increased since registration of Enlist products, and drift damage has increased over time due to increased adoption and usage of the Enlist weed control system. Accordingly, mitigation measures in the previous labels failed to reduce or prevent the adverse effects of spray drift in the early years of adoption. Since then, usage of Enlist products has increased, along with the threat of herbicide resistance, environmental degradation, and other cumulative effects. Despite evidence that the spray drift buffer has failed to mitigate damage to nearby crops and plants, *see* A018 at 71, EPA continues to rely on the same 30-foot spray drift buffer to mitigate spray drift effects. Consequently, EPA’s continued reliance on this buffer is arbitrary and capricious.

### **C. Runoff Measures**

EPA concluded that “there are potential risks to . . . terrestrial plants within 100 ft of [Enlist-resistant crops] as a result of surface runoff.” A018 at 71. EPA identified specific measures that operators *may* implement to reduce runoff potential and off-field impacts; however, rather than require users adopt these measures, EPA allowed users to select measures from a list of options (referred to as a “pick list”) for “credits” “based on the relative reductions of the different practices.” A022 at 15. According to EPA, the pick list measures are necessary to reduce runoff concentrations “by about a factor of 6x for scenarios with higher exposures.” *Id.* But evidence shows that the pick list measures will not achieve any reductions and may actually

increase runoff concentrations. *See infra*. Thus, EPA’s conclusion that the credit-based pick list will achieve the necessary reductions “runs counter to the evidence” before it, and EPA’s reliance on this measure is arbitrary and capricious. *State Farm*, 463 U.S. at 43.

Total Number of Applications: In setting the credits available to users, EPA failed to consider actual use data, which reveals that most operators who use Enlist products do not have to make *any* changes to their applications to meet the required number of credits. For example, EPA gives credits to growers that apply Enlist products once or twice a year, regardless of whether they actually reduce their total number of applications. Since most users only spray Enlist products once or twice a year,<sup>29</sup> they can receive this credit without making any reductions to their total number of applications. *See* A028 at 16 (“[M]ost soybean growers would be eligible for points with this option.”). And for users that only spray Enlist products once a year, they can actually *increase* their applications to twice a year and *still receive this credit*. Thus, because most users already satisfy the credit system without having to make any changes to their operations, EPA’s mitigation measures will not minimize 2,4-D and glyphosate concentrations in surface waters or nearby areas, and EPA’s reliance on this “mitigation” measure to reduce runoff impacts is arbitrary and capricious, in violation of FIFRA.

Increase in Total Amount Applied: Further, because EPA ignored application rate, there is no guarantee that a reduction in number of 2,4-D *applications* will result in a reduction in the *amount* applied and runoff exposure. Instead of incentivizing growers to plan applications based on field conditions and other factors, EPA’s measure encourages growers to increase the amount

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<sup>29</sup> A029 at 6 (89% of soybean acres sprayed with Enlist products were only sprayed once), 5 (65% of cotton acres sprayed with Enlist Duo were only sprayed once). Thus, under EPA’s pick list system, most cotton growers who spray Enlist Duo would be eligible for 4 points, and most cotton growers who spray Enlist One would be eligible for 2 points, without making any reductions in runoff impacts.

applied at one time to reduce the total number of applications. Accordingly, EPA failed to articulate a “rational connection between the facts found and the choice made” to use the pick list, which renders its registration decision arbitrary and capricious. *State Farm*, 463 U.S. at 43.

Ineffective Measures: Furthermore, EPA’s pick list includes ineffective measures. For example, EPA gives users 2 credits for “Vegetative Barrier: Permanent strips of dense vegetation along the contours of the field with a minimum width of 3 ft.” A008 at 16. However, in September 2021, EPA’s Environmental Fate and Effects Division (EFED) reviewed available studies and found that “turf buffers of 5 m[eters] or less are not effective at reliably reducing 2,4-D concentrations in runoff” and “[a]dditional studies would be needed to understand the variability in removal rates across different field and soil conditions as well as different types of vegetative buffers.” EPA\_0014088. Despite studies demonstrating that vegetative barriers must be *at least* 5 meters to reduce runoff impacts, possibly more depending on other factors, EPA authorized all growers to use a 3-foot grassed vegetative barrier as a runoff mitigation measure, in direct contradiction to its own scientists’ conclusion. *See Defs. of Wildlife v. Babbitt*, 958 F. Supp. 670, 685 (D.D.C. 1997) (agency’s decision was arbitrary and capricious because agency “ignored the views of its own experts”).

Thus, EPA’s mitigation measures do not prevent runoff because they allow operators to use ineffective barriers, and EPA’s decision to rely on these measures “runs counter to the evidence” before it, in violation of FIFRA. *State Farm*, 463 U.S. at 43.

## **REMEDY**

### **I. The Court Should Vacate the Enlist Registrations.**

Under the APA, reviewing court “shall . . . hold unlawful and set aside agency action, findings, and conclusions found to be . . . arbitrary, capricious, an abuse of discretion, or

otherwise not in accordance with law.” 5 U.S.C. § 706(2); accord *Ctr. for Biological Diversity*, 2024 WL 455047, at \*5. As such, vacatur is the default, presumptive remedy for invalid agency action, and thus *Defendants*, not Plaintiffs, carry the burden to show why vacatur is unwarranted. *Wilderness Soc’y*, 2024 WL 3443754, at \*3. In determining whether to depart from the ordinary remedy of vacatur, courts weigh two factors: (1) “the seriousness of the [agency’s] deficiencies (and thus the extent of doubt whether the agency chose correctly),” and (2) “the disruptive consequences of vacatur.” *City of Port Isabel v. FERC*, 130 F.4th 1034, 1036 (D.C. Cir. 2025) (quoting *Allied-Signal v. Nuclear Regul. Comm’n*, 988 F.2d 146, 150 (D.C. Cir. 1993)). Both the “deficiency” prong and the “disruption” prong should be grounded in the underlying statutory scheme violated: That is, whether a violation is serious or merely “technical” depends on the particular statutory scheme, *its* purpose, and how minor or major the violation is *within it*. Similarly, what consequences are considered sufficiently disruptive should center on those consequences against which Congress intended the statute to protect. In cases involving environmental statutes, like FIFRA, fashioning a remedy vindicating the purposes of those statutes—protection of the environment and public health—must be the paramount consideration of both prongs. Here, no exception to vacatur is warranted because the seriousness of EPA’s FIFRA violations outweighs any potential disruptive consequences.

**A. EPA’s Violations are Serious.**

Here, EPA’s errors in renewing the Enlist registrations are fundamental flaws that cut to the core of FIFRA’s purpose and thus weigh heavily in favor of vacatur:

- EPA fatally skewed the overall cost-benefit analysis by using erroneous use data, causing the agency to improperly discount environmental and public health effects. *See supra* pp. 18-22.
- EPA failed to evaluate and weigh weed resistance costs, such as increased weed control costs for farmers and increased spray drift and runoff damage from the

increased amounts of herbicides that must be applied to compensate for decreased efficacy. *See supra* pp. 22-26.

- As to public health, for glyphosate, EPA relied on a prior health assessment and decision another court struck down, detailing all the ways it was contrary to basic cancer risk assessment standards, and made similar errors for the health risks of 2,4-D. *See supra* pp. 27-36.
- EPA assumed and inflated Enlist’s purported benefits, contrary to the record. *See supra* pp. 36-43.
- Finally, EPA’s mitigation measures are arbitrary and capricious and contrary to the record. *See supra* pp. 43-47.

Similarly, in the dicamba litigation, the Ninth Circuit vacated EPA’s registration decision due to “fundamental flaws” with EPA’s FIFRA risk assessment of understating some risks and failing to assess others. *See Nat’l Family Farm Coal.*, 960 F.3d at 1145.<sup>30</sup>

**B. The Seriousness of EPA’s Error Outweighs Any Disruptive Consequences.**

This Court weighs the disruptive consequences of vacatur against the likelihood the agency will not reissue the same decision on remand. *Allied-Signal*, 988 F.2d at 151; *N.J. Conservation Found. v. FERC*, 111 F.4th 42, 64 (D.C. Cir. 2024) (“Where a pervasively deficient agency action is remanded, only in rare instances do the disruptive consequences alone determine whether the order is vacated.”). Thus, any “disruptive consequences of an interim change that may itself be changed” is outweighed by the seriousness of EPA’s error. *See e.g.*, *Dakota Rural Action v. USDA*, 668 F. Supp.3d 1, 9 (D.D.C. 2023) (“vacatur is necessary under this Circuit’s default rule” because “there is nothing in the record to confirm [the agency’s] insistence that it will be able to substantiate the challenged [decision] on remand”); *Env’t Def.*

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<sup>30</sup> EPA’s FIFRA violations are far more significant than the single “technical” violation in the prior Enlist litigation, where the court remanded but declined to vacate. *See Nat’l Fam. Farm Coal.* 966 F.3d at 929-30. Here, EPA’s errors are significant flaws that go to the heart of EPA’s cost-benefit analysis and mitigation evaluation, with widespread and substantial effects on the environment and public health.

*Fund v. FERC*, 2 F.4th 953, 976 (D.C. Cir. 2021) (while “there may be some disruption as a result of the interim change,” “we have identified serious deficiencies” that the agency is unlikely to be able “to rehabilitate”).

Again, in the legally and factually similar dicamba litigation, the Ninth Circuit held that although growers already invested in the dicamba crop system for the upcoming growing season, and “[v]acatur could leave those growers with an unusable pesticide technology system and force them to expend additional money on alternative seeds and pesticides,” the “absence of substantial evidence to support the EPA’s decision compels us to vacate the registrations.” *Nat’l Family Farm Coal.*, 960 F.3d at 1145. Even though growers had “been placed in this situation through no fault of their own,” the seriousness of EPA’s error outweighed the disruptive consequences. *Id.* So, too, here, because EPA’s error is fundamental to its duties under FIFRA, and it is unlikely that EPA will be able to adopt the same decision on remand, and any disruptive consequences are outweighed by the seriousness of EPA’s errors.

Finally, in the alternative, though Plaintiffs maintain the seriousness of EPA’s error outweighs any disruptive consequences, the Court could mitigate any potential consequences to growers who have already purchased the products by issuing prospective vacatur, prohibiting the future sale or distribution of Enlist One and Enlist Duo but would allow farmers to use their already purchased Enlist products in the upcoming growing season. *See e.g., Cigar Ass’n of Am. v. FDA*, 132 F.4th 535, 542 (D.C. Cir. 2025) (applying vacatur prospectively so as not to “disturb settled transactions”).

## CONCLUSION

For these reasons, the Court should grant Plaintiffs’ Motion for Summary Judgment and vacate the challenged registration decisions.

DATE: August 21, 2025

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that on this 21<sup>st</sup> day of August 2025, a true and correct copy of the foregoing **PLAINTIFFS' MOTION FOR SUMMARY JUDGMENT AND MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT** was e-filed via the ECF system and sent via e-mail to Federal Defendants' and Defendant-Intervenor's Counsel to:

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