Reregistration Eligibility Decision for Napropamide

Case No. 2450
Reregistration Eligibility Decision

for

Napropamide

Case No. 2450

Approved By:

___________________________
Debra Edwards, Ph.D.
Director, Special Review and
Reregistration Division

___________________________
Date
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Joanne Miller
**Glossary of Terms and Abbreviations**

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<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ai</td>
<td>Active Ingredient</td>
</tr>
<tr>
<td>aPAD</td>
<td>Acute Population Adjusted Dose</td>
</tr>
<tr>
<td>AR</td>
<td>Anticipated Residue</td>
</tr>
<tr>
<td>BCF</td>
<td>Bioconcentration Factor</td>
</tr>
<tr>
<td>CCA</td>
<td>Comparative Cholinesterase Assay</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>cPAD</td>
<td>Chronic Population Adjusted Dose</td>
</tr>
<tr>
<td>CSF</td>
<td>Confidential Statement of Formula</td>
</tr>
<tr>
<td>CSFII</td>
<td>USDA Continuing Surveys for Food Intake by Individuals</td>
</tr>
<tr>
<td>DCI</td>
<td>Data Call-In</td>
</tr>
<tr>
<td>DEEM</td>
<td>Dietary Exposure Evaluation Model</td>
</tr>
<tr>
<td>DFR</td>
<td>Dislodgeable Foliar Residue</td>
</tr>
<tr>
<td>DNT</td>
<td>Developmental Neurotoxicity</td>
</tr>
<tr>
<td>DWLOC</td>
<td>Drinking Water Level of Comparison</td>
</tr>
<tr>
<td>EC</td>
<td>Emulsifiable Concentrate Formulation</td>
</tr>
<tr>
<td>EC</td>
<td>Engineering Control</td>
</tr>
<tr>
<td>EDWC</td>
<td>Estimated Drinking Water Concentration</td>
</tr>
<tr>
<td>EEC</td>
<td>Estimated Environmental Concentration</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>EUP</td>
<td>End-Use Product</td>
</tr>
<tr>
<td>FDA</td>
<td>Food and Drug Administration</td>
</tr>
<tr>
<td>FIFRA</td>
<td>Federal Insecticide, Fungicide, and Rodenticide Act</td>
</tr>
<tr>
<td>FFDCA</td>
<td>Federal Food, Drug, and Cosmetic Act</td>
</tr>
<tr>
<td>FQPA</td>
<td>Food Quality Protection Act</td>
</tr>
<tr>
<td>FOB</td>
<td>Functional Observation Battery</td>
</tr>
<tr>
<td>G</td>
<td>Granular Formulation</td>
</tr>
<tr>
<td>GLN</td>
<td>Guideline Number</td>
</tr>
<tr>
<td>HAFT</td>
<td>Highest Average Field Trial</td>
</tr>
<tr>
<td>IR</td>
<td>Index Reservoir</td>
</tr>
</tbody>
</table>
| LC₅₀         | Median Lethal Concentration. A statistically derived concentration of a substance that can be
expected to cause death in 50% of test animals. It is usually expressed as the weight of substance per weight or volume of water, air or feed, e.g., mg/l, mg/kg or ppm.

**LD<sub>50** Median Lethal Dose. A statistically derived single dose that can be expected to cause death in 50% of the test animals when administered by the route indicated (oral, dermal, inhalation). It is expressed as a weight of substance per unit weight of animal, e.g., mg/kg.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOC</td>
<td>Level of Concern</td>
</tr>
<tr>
<td>LOD</td>
<td>Limit of Detection</td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
</tr>
<tr>
<td>MATC</td>
<td>Maximum Acceptable Toxicant Concentration</td>
</tr>
<tr>
<td>µg/g</td>
<td>Micrograms Per Gram</td>
</tr>
<tr>
<td>µg/L</td>
<td>Micrograms Per Liter</td>
</tr>
<tr>
<td>mg/kg/day</td>
<td>Milligram Per Kilogram Per Day</td>
</tr>
<tr>
<td>mg/L</td>
<td>Milligrams Per Liter</td>
</tr>
<tr>
<td>MOE</td>
<td>Margin of Exposure</td>
</tr>
<tr>
<td>MRID</td>
<td>Master Record Identification (number). EPA's system of recording and tracking studies submitted.</td>
</tr>
<tr>
<td>MUP</td>
<td>Manufacturing-Use Product</td>
</tr>
<tr>
<td>NA</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>NAWQA</td>
<td>USGS National Water Quality Assessment</td>
</tr>
<tr>
<td>NPDES</td>
<td>National Pollutant Discharge Elimination System</td>
</tr>
<tr>
<td>NR</td>
<td>Not Required</td>
</tr>
<tr>
<td>NOAEL</td>
<td>No Observed Adverse Effect Level</td>
</tr>
<tr>
<td>OPP</td>
<td>EPA Office of Pesticide Programs</td>
</tr>
<tr>
<td>OPPTS</td>
<td>EPA Office of Prevention, Pesticides and Toxic Substances</td>
</tr>
<tr>
<td>PAD</td>
<td>Population Adjusted Dose</td>
</tr>
<tr>
<td>PCA</td>
<td>Percent Crop Area</td>
</tr>
<tr>
<td>PDP</td>
<td>USDA Pesticide Data Program</td>
</tr>
<tr>
<td>PHED</td>
<td>Pesticide Handler's Exposure Data</td>
</tr>
<tr>
<td>PHI</td>
<td>Preharvest Interval</td>
</tr>
<tr>
<td>ppb</td>
<td>Parts Per Billion</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>ppm</td>
<td>Parts Per Million</td>
</tr>
<tr>
<td>PRZM/EXAMS</td>
<td>Tier II Surface Water Computer Model</td>
</tr>
<tr>
<td>Q1*</td>
<td>The Carcinogenic Potential of a Compound, Quantified by the EPA's Cancer Risk Model</td>
</tr>
<tr>
<td>RAC</td>
<td>Raw Agriculture Commodity</td>
</tr>
<tr>
<td>RED</td>
<td>Reregistration Eligibility Decision</td>
</tr>
<tr>
<td>REI</td>
<td>Restricted Entry Interval</td>
</tr>
<tr>
<td>Rfd</td>
<td>Reference Dose</td>
</tr>
<tr>
<td>RQ</td>
<td>Risk Quotient</td>
</tr>
<tr>
<td>SCI-GROW</td>
<td>Tier I Ground Water Computer Model</td>
</tr>
<tr>
<td>SAP</td>
<td>Science Advisory Panel</td>
</tr>
<tr>
<td>SF</td>
<td>Safety Factor</td>
</tr>
<tr>
<td>SLN</td>
<td>Special Local Need (Registrations Under Section 24©) of FIFRA</td>
</tr>
<tr>
<td>TGAI</td>
<td>Technical Grade Active Ingredient</td>
</tr>
<tr>
<td>TRR</td>
<td>Total Radioactive Residue</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
</tr>
<tr>
<td>USGS</td>
<td>United States Geological Survey</td>
</tr>
<tr>
<td>UF</td>
<td>Uncertainty Factor</td>
</tr>
<tr>
<td>UF&lt;sub&gt;db&lt;/sub&gt;</td>
<td>Database Uncertainty Factor</td>
</tr>
<tr>
<td>UV</td>
<td>Ultraviolet</td>
</tr>
<tr>
<td>WPS</td>
<td>Worker Protection Standard</td>
</tr>
</tbody>
</table>
Executive Summary

The Environmental Protection Agency (EPA) has concluded its reregistration eligibility decision for napropamide and determined that the chemical is eligible for reregistration provided that (1) current data gaps and additional data needs are addressed and (2) the risk mitigation measures outlined in this document are adopted and label amendments are made to implement these measures. EPA has also reassessed the 27 tolerances for napropamide under section 408(q) of FFDCA, as amended by FQPA.

EPA has completed its review of public comments on the revised napropamide risk assessments and is issuing its risk management decision. The revised risk assessments are based on review of the required data supporting the use patterns of currently registered products and additional information received. After considering the risks identified in the revised risk assessment, comments, and mitigation suggestions from interested parties, EPA developed its risk management decision for uses of napropamide that posed potential risks of concern.

Napropamide is an herbicide registered to control broadleaf weeds and annual grasses on numerous food/feed and non-food/feed use sites, including fruits and nuts, vegetables, ornamentals, turf/lawns, forestry sites and tobacco. Napropamide was first registered in 1972. Approximately 368,000 pounds of napropamide active ingredient are applied annually. Sites on which napropamide has the highest percent of crop treated include cranberries (30%), pepper and strawberries (15%), eggplant, tobacco, and tomatoes (10%).

Dietary Risk
Acute dietary risk was not assessed as there were no toxicological endpoints of concern attributable to a single exposure. The chronic dietary risk (food + water) of napropamide is well below the Agency’s level of concern for the general U.S. population and all population subgroups. The most highly exposed subgroup was children, 1-2 years old, with the estimated exposure at 1.8% of the cPAD. Therefore, no mitigation is warranted at this time for dietary risks.

Residential Risk

The estimated residential handler risks for all scenarios do not exceed the Agency’s level of concern. The MOEs ranged from 19,000 to 190,000. Residential post-application risks were also below EPA’s level of concern (the short term total MOE is 265). Therefore, no mitigation is warranted at this time for residential risks.

Aggregate Risk

Short-and long term (chronic) aggregate risks assessments were conducted for napropamide. The short-term assessment considered both dietary (food + water) and residential exposures. The long-term assessment considered dietary exposure only, since the current uses of napropamide are not expected to result in long-term residential exposure.

Short-term aggregate risk is below EPA’s level of concern for napropamide. Estimated short-term aggregate risk MOEs for adults and children (toddlers) are 14,340 and 260, respectively. The chronic aggregate risk estimates for the U.S. population and all subgroups are < 2% of the cPAD and, therefore, are also below the Agency’s level of concern. Therefore, no risk mitigation is warranted at this time for aggregate risks.

Occupational Risk

The Agency identified several occupational scenarios where exposure might occur. The occupational handler exposures estimated for all scenarios do not exceed the Agency’s level of concern (i.e., MOEs > 100). Therefore, no risk mitigation is warranted at this time for occupational risks.

Cumulative Risk

Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding as to napropamide and any other substances, and napropamide does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore, EPA has assumed that napropamide does not share a common mechanism of toxicity with other substances. For information regarding EPA’s efforts to determine which chemicals have a
common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the policy statements released by EPA’s Office of Pesticide Programs concerning common mechanism determinations and procedures for cumulating effects from substances found to have a common mechanism of EPA’s website at http://www.epa.gov/pesticides/cumulative/.

Ecological Risk

Based on high-end estimated environmental concentrations, chronic levels of concern (LOCs) were exceeded for mammals that feed on all food types the Agency assesses (i.e., short grass, tall grass, broadleaf plants and small insects, fruits/pods/large insects) for all modeled use rates. Risk quotient (RQ) estimates ranged up to 21 (LOC=1). For terrestrial and wetland/riparian plants (monocot and dicot), RQs for seedling emergence in areas adjacent to treated fields exceeded LOCs at all modeled application rates. RQ estimates ranged up to 12. EPA believes the risks can be substantially reduced through the implementation of the following mitigation measures: 1) requiring application rate reductions; and 2) cancelling use on a number of crops.

Endangered Species

Based on EPA’s screening level assessment, RQs for napropamide exceed acute levels of concern for direct effects to endangered species of mammals, mollusks, marine/estuarine crustaceans, aquatic vascular plants and terrestrial and semi-aquatic plants (both dicots and monocots). RQs were also exceeded for chronic direct effects to mammals. Further, based on screening level assessments of potential direct effects to these taxa, the potential for indirect effects to all taxa of listed species can not be precluded at this time. These findings are based solely on EPA’s screening level assessment and do not constitute “may affect” finding under the Endangered Species Act.

Next Steps

The Agency is issuing this RED document for napropamide as announced in a Notice of Availability published in the Federal Register. In the near future, EPA will issue generic DCI for additional data necessary to confirm the conclusions of this RED for the active ingredient napropamide. EPA will also issue a product specific DCI for data necessary to complete product reregistration for products containing napropamide.
I. **Introduction**

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) was amended in 1988 to accelerate the reregistration of products with active ingredients registered prior to November 1, 1984. The amended Act calls for the development and submission of data to support the reregistration of an active ingredient, as well as a review of all submitted data by the U.S. Environmental Protection Agency (referred to as EPA or "the Agency"). Reregistration involves a thorough review of the scientific database underlying a pesticide's registration. The purpose of the Agency's review is to reassess the potential risks arising from the currently registered uses of the pesticide; to determine the need for additional data on health and environmental effects; and to determine whether or not the pesticide meets the "no unreasonable adverse effects" criteria of FIFRA.

On August 3, 1996, the Food Quality Protection Act of 1996 (FQPA) was signed into law. This Act amends FIFRA and the Federal Food Drug and Cosmetic Act (FFDCA) to require reassessment of all existing tolerances for pesticides in food. FQPA also requires EPA to review all tolerances in effect on August 2, 1996 by August 3, 2006. In reassessing these tolerances, the Agency must consider, among other things, aggregate risks from non-occupational sources of pesticide exposure, whether there is increased susceptibility to infants and children, and the cumulative effects of pesticides with a common mechanism of toxicity. When a safety finding has been made that aggregate risks are not of concern and the Agency concludes that there is a reasonable certainty of no harm from aggregate exposure, the tolerances are considered reassessed. EPA decided that, for those chemicals that have tolerances and are undergoing reregistration, tolerance reassessment will be accomplished through the reregistration process.
As mentioned above, FQPA requires EPA to consider "available information" concerning the cumulative effects of a particular pesticide's residues and "other substances that have a common mechanism of toxicity" when considering whether to establish, modify, or revoke a tolerance. Potential cumulative effects of chemicals with a common mechanism of toxicity are considered because low-level exposures to multiple chemicals causing a common toxic effect by a common mechanism could lead to the same adverse health effect as would a higher level of exposure to any one of these individual chemicals. For information regarding EPA’s efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the policy statements released by the EPA’s Office of Pesticide Programs concerning common mechanism determinations and procedures for cumulating effects from substances found to have a common mechanism on EPA’s website at http://epa.gov/pesticides/cumulative/.

Unlike other pesticides for which EPA has considered cumulative risk based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding for napropamide. The Agency has found no information indicating napropamide shares a common mechanism of toxicity with other substances. Napropamide does not appear to produce a toxic metabolite produced by other substances. Therefore, for the purposes of tolerance reassessment and a decision on reregistration eligibility, EPA has assumed that napropamide does not share a common mechanism of toxicity with other compounds. In the future, if additional information suggests napropamide shares a common mechanism of toxicity with other compounds, additional testing may be required and a cumulative assessment may be necessary.

This document presents EPA’s revised human health and ecological risk assessments and the reregistration eligibility decision for napropamide. This document consists of six sections and appendices. Section I contains the regulatory framework for re-registration/tolerance reassessment. Section II provides a profile of the use and usage of the chemical. Section III gives an overview of the revised human health and environmental effects risk assessments based on data, public comments, and other information received in response to the preliminary risk assessments. Section IV presents the Agency’s reregistration eligibility and risk management decisions. Section V summarizes label changes necessary to implement the risk mitigation measures outlined in Section IV. The appendices in Section VI list related and supporting documents, studies submitted to support EPA’s data requirements for reregistration, and generic and product Data Call-Ins (DCIs), and provide information on how to access related documents. The preliminary and revised risk assessments for napropamide are available in the Public Docket, under docket number(s) OPP-2004-0162 and on the Agency’s web page, http://www.epa.gov/edockets.
II. Chemical Overview

A. Regulatory History

Napropamide has been registered in the United States since 1972 for use as a herbicide. A Data Call-In (DCI) was issued in 1989 requiring the submission of additional data on product and residue chemistry, toxicity, environmental fate, and ecological effects. Subsequent DCIs were issued in 1991, 1994 and 1995 which required additional product chemistry, environmental fate, processing and residue crop field trial studies. This Registration Eligibility Decision (RED) reflects a reassessment of all data which were submitted in response to the DCIs.

B. Chemical Identification

![Chemical Structure]

Common Name: Napropamide

Trade Name: Devrinol®.

Chemical Name: N,N-diethyl-2-(1-naphthalenyl)oxy)propanamide

Chemical Family: Amide

Case Number: 2450

CAS Registry Number: 15299-99-7

OPP Chemical Code: 103001

Molecular weight: 271.4

Empirical Formula: C_{17}H_{21}NO_{2}

Basic Manufacturers: United Phosphorus Inc.
Table 1: Physicochemical Properties of Napropamide

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point</td>
<td>68-70 °C</td>
</tr>
<tr>
<td>pH</td>
<td>8.9 at 22 °C</td>
</tr>
<tr>
<td>Density, bulk density, or specific gravity</td>
<td>0.584 g/mL at 22 °C</td>
</tr>
<tr>
<td>Water solubility</td>
<td>74 mg/L at 25 °C</td>
</tr>
<tr>
<td>Solvent solubility at 20 °C</td>
<td>Miscible with acetone, chlorobenzene, ethanol, and dichloromethane</td>
</tr>
<tr>
<td></td>
<td>4.5 g/100 mL in kerosene</td>
</tr>
<tr>
<td></td>
<td>17.7 g/100 mL in n-octanol</td>
</tr>
<tr>
<td></td>
<td>55.5 g/100 mL in xylene</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>1.7 x 10^{-7} torr or 2.3 x 10^{-5} Pa at 25 °C</td>
</tr>
<tr>
<td>Dissociation constant, pH&lt;sub&gt;a&lt;/sub&gt;</td>
<td>Not applicable; napropamide is neither an acid nor a base.</td>
</tr>
<tr>
<td>Octanol/water partition coefficient</td>
<td>2.1 x 10&lt;sup&gt;4&lt;/sup&gt; (log K&lt;sub&gt;ow&lt;/sub&gt; = 3.3)</td>
</tr>
<tr>
<td>UV/visible absorption spectrum</td>
<td>Neutral (201.8 nm): A=1.1144, ε = 58560 mol&lt;sup&gt;-1&lt;/sup&gt; cm&lt;sup&gt;-1&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Acidic (215 nm): A=1.1198, ε=58844 mol&lt;sup&gt;-1&lt;/sup&gt; cm&lt;sup&gt;-1&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Basic: unstable in alkaline solution</td>
</tr>
</tbody>
</table>

C. Use Profile

The following is information on the currently registered uses, including an overview of use sites and application methods.

Type of Pesticide: Herbicide

Target organism(s): Napropamide is registered to control numerous broadleaf weeds and annual grasses.

Mode of action: Napropamide controls weeds by preventing root cell elongation, thus disrupting the growth process during germination.

Use Sites:

Food uses:

- Berries/small fruit (blackberry, boysenberry, loganberry, raspberry, blueberry, strawberry, cranberry, currant, grape)
- Brassica and leafy vegetables (broccoli, Brussels sprouts, cabbage, cauliflower, asparagus)
- Citrus (grapefruit, lemon, orange, tangerine, tangelo)
- Fruiting vegetables (eggplant, pepper, tomato)
Nuts (almond, pistachio, pecan, filbert, walnut)

Pome Fruit (apple, pear)

Stone Fruit (apricot, cherry, nectarine, peach, plum, prune)

Tropical Fruit (kiwi, persimmon, avocado, pomegranate)

Additional Crops (artichoke, fig, mint, olive, rhubarb, sweet potato)

Non-Food, Greenhouse & Residential Uses:

- Tobacco
- Trees/Ornamentals (conifer, shade tree, ornamental tree, ground cover, herbaceous, plants, woody shrubs, vines, lawns, turf, potting soil)

Use Classification: General Use Pesticide

Formulation Types: Napropamide is formulated as dry flowable, granular and liquid formulations.

Application Methods: Aerial application, ground boom, hand-held sprayers, granular application equipment, and chemigation equipment.

Application Rates: Napropamide is applied at rates between 2 and 6 pounds active ingredient per acre (lbs a.i./A) on all crops/sites except cranberries, where applications at up to 15 lbs a.i./A are allowed. Aerial applications are allowed for cranberries only. Applications for all other uses are made using ground equipment, including groundboom and hand-held sprayers, granular application equipment, and chemigation equipment.

Application Timing: Timing ranges across different stages of plant development in both agricultural and ornamental plant settings.

D. Estimated Usage of Pesticide

Table 2 below summarizes the best available estimates for the pesticide usage of napropamide with “screening level” usage data for agricultural crops. This information was retrieved from EPA’s principal pesticide usage databases using current estimates. In addition, this table reflects only the highest usage sites. Based on Agency data, the average total annual domestic usage of napropamide was approximately 368,000 pounds. The predominant usage is in California. The highest usage, by crop, is on cranberries with 30% crop treated.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Lbs. A.I.</th>
<th>% Crop Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cranberries</td>
<td>50,000</td>
<td>30</td>
</tr>
<tr>
<td>Strawberries</td>
<td>30,000</td>
<td>15</td>
</tr>
</tbody>
</table>
### III. Summary of Napropamide Risk Assessment

The purpose of this summary is to assist the reader by identifying the key features and findings of these risk assessments, and to help the reader better understand the conclusions reached in the assessments. The human health and ecological risk assessment documents and supporting information listed in Appendix C were used to reach the safety finding and regulatory decision for napropamide. While the risk assessments and related addenda are not included in this document, they are available from the OPP Public Docket OPP-2004-0162 and may be accessed on the Agency’s website at [http://epa.gov/edockets](http://epa.gov/edockets). Paper copies of these documents may be found in the OPP Public Docket under the above docket number. The OPP public docket is located in Room 119, Crystal Mall II, 1801 South Bell Street, Arlington, VA, and is open Monday through Friday, excluding Federal holidays, from 8:30 a.m. to 4:00 p.m.

#### A. Human Health Risk Assessment

EPA released its preliminary risk assessments for napropamide for public comment on March, 16, 2005 (Phase 3 of the public participation process). During the public comment period, the registrant (United Phosphorus, Inc.) proposed reducing the maximum application rate for cranberries. United Phosphorus also indicated that the company will not support existing tolerances for cucurbit vegetables and coffee. The changes proposed by the registrant would result in lower estimates of dietary and non-dietary exposure to napropamide. However, because the estimated risks based on the Agency’s previous exposure assessments are well below EPA’s level of concern, a revised risk assessment reflecting the proposed changes is not warranted and has not been conducted.

#### 1. Toxicity of Napropamide

The available toxicity data on napropamide are adequate to assess the chemical’s hazard potential. The most common effect in animal studies (dogs, mice and rats) from long-term oral exposure was a decrease in body weight or body weight gain, with females being more sensitive than males to effects on body weight. Technical napropamide has low acute toxicity (category III/IV) via the oral, dermal and inhalation routes of exposure. It is moderately irritating to the eye (category II) but does not cause skin irritation or dermal sensitization.

Further details on the toxicity of napropamide can be found in the “Napropamide: Revised HED Chapter of the Reregistration Eligibility Decision (RED),” dated February 23, 2005.
a. Acute Toxicity Profile

Table 3 below lists the acute toxicity categories for the different routes of exposure.

Table 3: Acute Toxicity Data for Napropamide

<table>
<thead>
<tr>
<th>Guideline No.</th>
<th>Study Type</th>
<th>MRID(s)</th>
<th>Results</th>
<th>Toxicity Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>870.11</td>
<td>Acute oral [rat]</td>
<td>40362902</td>
<td>LD₅₀ = &gt;5000 mg/kg</td>
<td>IV</td>
</tr>
<tr>
<td>870.12</td>
<td>Acute dermal [rabbit]</td>
<td>40362902</td>
<td>LD₅₀ = &gt;2000 mg/kg</td>
<td>III</td>
</tr>
<tr>
<td>870.13</td>
<td>Acute inhalation [rat]</td>
<td>42231501</td>
<td>LCₕ₀ = &gt;4.8 mg/L</td>
<td>IV</td>
</tr>
<tr>
<td>870.24</td>
<td>Acute eye irritation [rabbit]</td>
<td>40362902</td>
<td>moderate</td>
<td>II</td>
</tr>
<tr>
<td>870.25</td>
<td>Acute dermal irritation [rabbit]</td>
<td>40362902</td>
<td>none</td>
<td>IV</td>
</tr>
<tr>
<td>870.26</td>
<td>Skin sensitization [guinea pig]</td>
<td>40362903</td>
<td>negative</td>
<td>Nonsensitizing</td>
</tr>
</tbody>
</table>

b. Developmental & Reproductive Toxicity/FQPA Safety Factor

The Federal Food Drug and Cosmetic Act (FFDCA) as amended by the Food Quality Protection Act (FQPA) directs the Agency to use an additional tenfold (10X) safety factor to take into account potential pre- and post-natal toxicity and completeness of the data with respect to exposure and toxicity to infants and children. FFDCA authorizes the Agency to modify the tenfold safety factor only if reliable data demonstrate that the resulting level of exposure would be safe for infants and children.

Napropamide did not cause developmental toxicity in fetuses from either rats or rabbits and did not adversely affect reproductive parameters in rats over three generations. There is no quantitative or qualitative evidence of increased susceptibility of rat or rabbit fetuses after in utero and/or postnatal exposure to napropamide in the developmental and reproduction studies. Dose-response relationships are well-characterized and clear NOAELs/LOAELs have been identified for the critical effects. No evidence of neurotoxicity was observed in any study. Based on the weight of evidence, a developmental neurotoxicity (DNT) study is not required for napropamide, and adequate chemical specific data, surrogate data, and modeling outputs are available to assess dietary and residential exposures. EPA has high confidence that results do not under estimate exposure. Therefore, the special FQPA safety factor can be reduced to 1X.

c. Carcinogenicity

No evidence for carcinogenicity was seen in mice or rat studies. Napropamide has been classified a Group “E” carcinogen (no evidence of carcinogenicity). Therefore, a cancer assessment was not conducted.
d. **Endocrine Effects**

EPA is required under the FFDCA, as amended by FQPA, to develop a screening program to determine whether certain substances (including all pesticide active and other ingredients) “may have an effect in humans that is similar to an effect produced by a naturally occurring estrogen, or other such endocrine effects as the Administrator may designate.” Following recommendations of its Endocrine Disruptor and Testing Advisory Committee (EDSTAC), EPA determined that there was a scientific basis for including, as part of the program, the androgen and thyroid hormone systems, in addition to the estrogen hormone system. EPA also adopted EDSTAC’s recommendation that the Program include evaluations of potential effects in wildlife. For pesticide chemicals, EPA will use FIFRA and, to the extent that effects in wildlife may help determine whether a substance may have an effect in humans, FFDCA authority to require the wildlife evaluations. As the science develops and resources allow, screening of additional hormone systems may be added to the Endocrine Disruptor Screening Program (EDSP).

In the available toxicity studies on napropamide, there was no estrogen, androgen, and/or thyroid mediated toxicity. Future testing with appropriate screening and/or testing protocols could better characterize effects related to endocrine disruption.

e. **Toxicological Endpoints for Risk Assessment**

The toxicological endpoints used in the human health risk assessment for napropamide are listed in Table 4. The safety factors used to account for interspecies extrapolation, intraspecies variability and the FQPA safety factor are also described in Table 4. No toxicological endpoint was selected for the acute dietary exposure scenario, since an endpoint attributable to a single exposure was not identified from the available database. Therefore, no acute dietary assessment was performed.

<table>
<thead>
<tr>
<th>Table 4: Summary of the Toxicology Endpoint Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chronic Dietary Endpoint</strong></td>
</tr>
<tr>
<td><strong>Exposure Scenario</strong></td>
</tr>
<tr>
<td><strong>Dose &amp; Uncertainty Factors</strong></td>
</tr>
<tr>
<td><strong>Endpoint</strong></td>
</tr>
<tr>
<td><strong>Study</strong></td>
</tr>
<tr>
<td>Chronic Dietary</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

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2. Dietary Exposure and Risk from Food and Drinking Water

a. Exposure Assumptions (Food)

The chronic dietary exposure and risk analysis for napropamide was conducted using the Lifeline™ Model Version 2.0, which uses food consumption data from the United States Department of Agriculture’s (USDA’s) Continuing Surveys of Food Intakes by Individuals (CSFII) from 1994-1996 and 1998. In this analysis, the chronic dietary exposure and risk estimates resulting from food intake were determined for the general U.S. population and various population subgroups. The chronic analysis assumed 100% crop treated and tolerance-level residues (Tier 1) for all commodities. As such, this is considered an unrefined assessment (Tier 1).

b. Exposure Assumptions (Drinking Water)

The Tier II screening models, Pesticide Root Zone Model and Exposure Analysis Modeling System (PRZM-EXAMS), with the Index Reservoir and Percent Crop Area adjustment (IR-PCA PRZM/EXAMS), were used to estimate napropamide residues in surface water used for drinking water.

Estimated ground water concentrations are based on the Screening Concentration in Ground Water (SCI-GROW) model, which is a Tier 1 assessment that provides a high-end estimate. The SCI-GROW model generates a single Estimated Drinking Water Concentration
(EDWC) value of pesticide concentration in ground water used for drinking water and provides a ground water screening concentration for use in determining potential risk to human health from drinking water contaminated with a pesticide.

Napropamide is persistent but not particularly mobile, and therefore, is not expected to pose a significant risk of ground water contamination. Surface water contamination is possible through run-off from treated fields. Estimated concentration from napropamide in ground water is 4.5 ppb. From the original drinking water assessment (“Drinking Water Assessment for Napropamide for Terrestrial Uses”, dated August 17, 2004), the estimated concentration is 0.5 ppb in surface water. The highest estimated chronic drinking water concentration (4.5 ppb) from ground water modeling was used for the dietary analysis.

In a memo, “Revised Drinking Water Assessment for Napropamide” dated November 12, 2004, the Agency revised the chronic estimate for surface water (5.1 ppb). The revised chronic surface water estimate of 5.1 ppb is slightly higher than the drinking water estimate used in this assessment (4.5 ppb); however, because of the minimal impact the revised estimate would be expected to have on overall dietary (and aggregate) risk, the Agency determined that a new dietary assessment was not warranted.

c. Population Adjusted Dose

Chronic dietary risk is calculated by using the average consumption values for foods and average residue values on those foods. A risk estimate that is less than 100% of the chronic Population Adjusted Dose (cPAD) (the dose at which an individual could be exposed over the course of a lifetime and no adverse health effects would be expected) is below the Agency’s level of concern. An uncertainty factor of 100x was applied to the chronic dietary assessment for inter- and intraspecies variations, and the FQPA safety factor was reduced to 1x as discussed in the dietary risk section.

d. Chronic Dietary Risk Estimates

The Tier 1 chronic dietary assessment indicates that the combined exposure to napropamide from food and water is well below the Agency’s level of concern, with estimated exposures representing <2% of the cPAD for the U.S. population and all population subgroups, including infants and children. Please note that this is a Tier 1 assessment; and therefore, risks are considered to be upper end estimates.

3. Residential Exposure and Risk

Residential exposure assessment considers all potential non-occupational pesticide exposures, other than exposure due to residues in foods or in drinking water. Exposure may occur during and after application on lawns and turf and ornamental plants. Each route of exposure (oral, dermal, inhalation) is assessed, where appropriate, and risk is expressed as a
Margin of Exposure (MOE), which is the ratio of estimated exposure to an appropriate No Observed Adverse Effect Level (NOAEL) dose. Napropamide products are marketed for homeowner use on residential lawns and landscape ornamental plants. Napropamide containing products are also marketed for use by professional applicators (Lawn Control Operators [LCOs]) on residential turf, golf courses, other turf such as recreational/commercial areas, and on ornamental plantings. Based on these uses, napropamide has been assessed for the residential mixing/loading/applicator (or “handler”) exposure and for children’s post-application exposure that may occur from turf contact and hand-to-mouth transfer.


a. Residential Exposure & Duration

Short-or intermediate-term dermal exposures or risks were not assessed for napropamide, since an appropriate dermal toxicological endpoint was not identified. EPA assessed short-term inhalation exposure for handlers and short-term incidental oral postapplication exposure for children in treated areas. Since exposure scenarios for napropamide are only considered to be short-term in nature due to the episodic use patterns, EPA does not anticipate long-term exposures. Therefore, no long-term dermal or inhalation exposures or risks were assessed. The toxicological endpoints used for the residential risk assessment are provided in the Table 4.

b. Residential Handler

1. Exposure Scenarios, Data, and Assumptions

There is a potential for exposure in residential settings during the application process for homeowners who use products containing napropamide. Homeowner-use products are available in granular form. Napropamide can be applied by hand or by using shaker cans, push-type spreaders, and belly grinders. A number of standard assumptions, such as adult body weight and area treated per application, are made by the Agency for residential risk assessment. Also, note that residential handlers are addressed somewhat differently than occupational handlers in that homeowners are assumed to complete all elements of an application (mix/load/apply) without use of protective equipment (assessments are based on an assumption that individuals will be wearing short pants, short-sleeved shirts, shoes and socks). This is to ensure that EPA does not underestimate potential risks.

The quantitative exposure/risk assessment developed for residential handlers is based on these scenarios:
(1) Applying granulars by hand application
(2) Applying granulars with a shaker can
(3) Loading/applying granulars with a belly grinder application
(4) Loading/applying granulars with a push type spreader application

Chemical-specific data to assess the above exposure scenarios were not submitted to the Agency in support of reregistration. Instead, exposure estimates for these scenarios are derived from the Pesticide Handlers Exposure Database (PHED, Version 1.1 August 1998) which is used to assess handler exposures when chemical-specific monitoring data are not available. In addition to PHED data, this risk assessment relies on data from the Outdoor Residential Exposure Task Force (ORETF) and proprietary studies.

The following assumptions were used in the exposure calculations:

- Maximum application rates allowed by labels were used to conduct the risk assessment.
- Residential risk assessments calculations were based on what would reasonably be treated by homeowners such as the size of a lawn, or the size of a garden.

c. Residential Handler Risk Estimates

A Margin of Exposure (MOE) greater than or equal to 100 (10x for interspecies extrapolation and 10x for intraspecies variation) is considered adequately protective for this assessment. As noted above, only handler inhalation risks were assessed since no appropriate dermal endpoint was identified in the toxicity database for napropamide. The estimated risks for all scenarios do not exceed the Agency’s level of concern for inhalation risk assessments. The MOEs ranged from 28,000 to 190,000.

<table>
<thead>
<tr>
<th>Exposure Scenario</th>
<th>Crop or Target</th>
<th>Application Rate (lb ai/unit)</th>
<th>AmountHandled Daily</th>
<th>Inhalation Dose (mg/kg/day)</th>
<th>Inhalation MOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixer/Loader/Applicator</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Applying Granulars for Hand application (1)</td>
<td>ornamentals</td>
<td>6</td>
<td>0.023</td>
<td>0.0011</td>
<td>28000</td>
</tr>
<tr>
<td>Applying Granulars for Shaker can application (2)</td>
<td>ornamentals</td>
<td>6</td>
<td>0.023</td>
<td>0.0011</td>
<td>28000</td>
</tr>
<tr>
<td>Loading/Applying Granulars for Belly Grinder application (3)</td>
<td>turf</td>
<td>3</td>
<td>0.5</td>
<td>0.0016</td>
<td>19000</td>
</tr>
<tr>
<td>Loading/Applying Granulars for Push-type spreader application (4)</td>
<td>turf</td>
<td>3</td>
<td>0.5</td>
<td>0.00016</td>
<td>190000</td>
</tr>
</tbody>
</table>

d. Residential Post-application Risk

Different segments of the population, including toddlers and adults, can be exposed to napropamide by various activities in a residential setting. The scenarios chosen in the risk assessment represent these activities, and are considered to represent upper-end estimates of
exposure. For the purpose of this assessment, it was assumed that both children and adults may be exposed following applications of napropamide to treated areas, with toddlers having the greatest potential exposure. An MOE of 100 (or more) is below the Agency’s level of concern for this assessment.

The Standard Operating Procedures for Residential Exposure Assessment define several scenarios that apply to uses specified in the current napropamide labels. The Agency used this guidance to define the toddler exposure scenarios included in this post-application exposure assessment.

The quantitative exposure/risk assessment for post-application risk to children is based on these scenarios:

- **Hand-to-mouth transfer from treated turf**: Post-application exposure to children from the “incidental” ingestion of pesticide residues on treated turf from hand-to-mouth transfer (i.e., those residues that end up in the mouth from children touching turf and then putting their hands in their mouth).

- **Object-to-mouth transfer from treated turf**: Post-application exposure to children from incidental ingestion of pesticide residues on treated turf from object-to-mouth transfer (i.e., those residues that end up in the mouth from a child mouthing objects that contact of treated turf).

- **Soil ingestion activity**: Post-application exposure to children from incidental ingestion of soil in a treated area.

Inhalation risks were not assessed for postapplication scenarios because inhalation exposure is considered negligible given the low vapor pressure of napropamide. As noted above, no appropriate dermal endpoint was identified. Therefore, only incidental oral exposures were assessed.

Napropamide may be applied as granular product to turf, and episodic ingestion of these granules by children may occur which would be considered on acute exposure. An episodic granular ingestion assessment for children was not performed since no acute dietary endpoint of concern was identified for napropamide.

**e. Post-application Risk Estimates**

For napropamide, MOEs greater than or equal to 100 do not exceed the Agency’s level of concern. This incorporates the standard uncertainty factors of 10x for interspecies variability and 10x for intraspecies variability. Risks were calculated for incidental oral hand-to-mouth, object to mouth and soil ingestion pathways. The estimated short term total MOE is 265, and risk is, therefore, below EPA’s level of concern.
Table 6: Short-Term (Aggregate) Napropamide Residential Scenarios for Post-Application Risk Estimates

<table>
<thead>
<tr>
<th>Exposure Scenario</th>
<th>Margins of Exposure (MOEs) (UF=100)</th>
<th>Dermal</th>
<th>Oral (Non-Dietary)</th>
<th>Total Non-Dietary Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-term Exposures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toddler Turf: 6 lb ai/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand to Mouth</td>
<td>N/A</td>
<td>335</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Object to Mouth</td>
<td>N/A</td>
<td>1340</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidental Soil Ingestion</td>
<td>N/A</td>
<td>10000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Aggregate Exposure and Risk

The Food Quality Protection Act amendments to the Federal Food, Drug, and Cosmetic Act (FFDCA, Section 408(b)(2)(A)(ii)) require “that there is a reasonable certainty that no harm will result from aggregate exposure to pesticide chemical residue, including all anticipated dietary exposures and other exposures for which there is reliable information.” Aggregate exposure will typically include exposures from food, drinking water, residential uses of a pesticide, and other non-occupational sources of exposure.

A toxicological endpoint of concern attributable to a single dose has not been identified for napropamide. Therefore, an acute aggregate risk assessment has not been conducted. Intermediate term exposure durations are not expected for napropamide use pattern. Therefore, an intermediate aggregate assessment has not been conducted.

a. Short-Term Aggregate Risk

Short-term aggregate exposure takes into account residential exposure plus average exposure levels from residues of napropamide in food and water. The MOE level of concern for short-term aggregate risk is 100. Since the estimated short-term aggregate risk MOE for the most highly sensitive population (children 1 to 2 years old) is 260, short-term aggregate risk is below EPA’s level of concern for napropamide.

Table 7: Napropamide Short-Term Aggregate Risk

<table>
<thead>
<tr>
<th>Population</th>
<th>NOAEL (mg/kg/day)</th>
<th>Level of Concern</th>
<th>Max Exposure (mg/kg/day)</th>
<th>Average Food + Water Exposure (mg/kg/day)</th>
<th>Residential Exposure (mg/kg/day)</th>
<th>Aggregate MOE (food and residential)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children, 1-2 yrs. old</td>
<td>30</td>
<td>MOE ≤ 100</td>
<td>0.3</td>
<td>0.00222</td>
<td>0.113</td>
<td>260</td>
</tr>
</tbody>
</table>

b. Chronic Aggregate Risk

The chronic aggregate risk assessment considered exposures from food and water only because there are no residential uses expected to result in chronic exposures for this chemical.
The chronic aggregate risk estimates for the U.S. population and all subgroups are < 2% of the cPAD and, therefore, below the Agency’s level of concern.

5. Cumulative Risk

Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding as to napropamide and any other substances, and napropamide does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore, EPA has assumed that napropamide does not share a common mechanism of toxicity with other substances. For information regarding EPA’s efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the policy statements released by EPA’s Office of Pesticide Programs concerning common mechanism determinations and procedures for cumulating effects from substances found to have a common mechanism of EPA’s website at http://www.epa.gov/pesticides/cumulative/.

6. Occupational Risk

Workers can be exposed to a pesticide through mixing, loading, and/or applying a pesticide, or re-entering treated sites. Occupational handlers of napropamide include workers in agricultural areas and workers applying napropamide on ornamental plants. Occupational risk for all of these potentially exposed populations is measured by a Margin of Exposure (MOE) which determines how close the occupational exposure comes to a No Observed Adverse Effect Level (NOAEL). In the case of napropamide, risk estimates resulting in MOEs greater than 100 do not exceed the Agency’s level of concern.

Occupational risk is assessed for exposure at the time of application (termed “handler” exposure) and exposure following application (termed post-application exposure). Application parameters are generally defined by the physical nature of the formulation (e.g., formula and packaging), the equipment required to deliver the chemical to the use site, and the application rate required to achieve an efficacious dose. Post-application risk is assessed for activities such as scouting, irrigating, pruning, and harvesting and is based primarily on dermal exposure estimates.

For more information on the assumptions and calculations of potential risk of napropamide to workers, see the “Napropamide: Revised Occupational and Residential Exposure Assessment” dated February 20, 2005.

a. Occupational Toxicity

No short- or intermediate-term occupational dermal endpoint of concern was identified for napropamide. The short and intermediate-term occupational inhalation endpoint of concern exposure was selected from a reproduction study in rats. A profile of the toxicity and endpoints for napropamide is outlined above in Table 4.
b. Occupational Handler Exposure

Occupational handler risk estimates have been assessed for both short- and intermediate-term exposure durations. Napropamide exposures may occur over a single day or up to two weeks at a time. For many use-patterns intermittent exposures over several weeks also may occur. However, long-term (i.e., > 6 months) handler exposures are not expected.

Occupational handler assessments are conducted using increasing levels of protection. The Agency typically evaluates all exposures with minimal or baseline protection and then considers additional protective measures using a tiered approach (going from minimum to maximum levels of protection) until predicted risks are below EPA’s level of concern. In the case of napropamide, MOEs for every occupational exposure scenario are above 100 at baseline PPE (long-sleeved shirt, long pants, socks, and shoes). While the generic assessment for napropamide does not indicate a need for additional PPE, evaluation of end-use product toxicity data may require additional protection. End-use product PPE will be determined on a product-by-product basis.

c. Occupational Handler Risk Summary

The Agency has determined that there are potential exposures to workers who mix, load, apply, and otherwise handle napropamide consistent with the usual napropamide use patterns. Fifteen major occupational handler exposure scenarios were identified as follows:

1. mixing/loading dry flowables for groundboom applications;
2. mixing/loading dry flowables for chemigation application;
3. mixing/loading granulars for tractor-drawn spreaders applications;
4. mixing/loading granulars for aerial applications;
5. mixing/loading liquids for chemigation application;
6. mixing/loading liquids for groundboom application;
7. mixing/loading liquids for high-pressure handwand application;
8. applying sprays for groundboom application;
9. applying sprays for high-pressure handwand application;
10. applying granulars with a tractor-drawn spreader;
11. applying granulars for aerial application;
12. loading/applying granulars for belly-grinder applications;
13. loading/applying granulars for push-type spreader application;
14. mixing/loading/applying liquid for handgun (lawn) application;
15. flagging for granular application.

Occupational Handler Exposure Assumptions and Data
Chemical-specific data to assess the exposure scenarios were not available for napropamide. Analyses were completed using acceptable surrogate exposure data. Several handler assessments were completed using data from the Pesticide Handler Exposure Database (PHED version 1.1). Some handler assessments (i.e., handheld handgun equipment, push-type spreader) were completed using data from the Outdoor Residential Exposure Task Force (ORETF).

The following assumptions and factors were used:

- The average body weight of an adult female handler (i.e., 60 kg) is used to complete the risk assessment.
- Risk are assessed at maximum label rates.
- The occupational workday was 8 hours.
- The daily treatment areas treated are defined for each handler scenario by determining the amount that can be reasonably treated in a single day.

**d. Occupational Handler Risk Estimates**

Short- and intermediate-term inhalation Margin of Exposure estimates for occupational handler scenarios are greater than 100 at the baseline level of protection (i.e., long-sleeved shirt, long pants, shoes plus socks, no respirator). Short- and intermediate-term inhalation MOEs range from 200 to more than 33,000. Therefore, short- and intermediate-term occupational risks are not of concern.

**e. Occupational Post-application Risk**

Since no dermal endpoint has been identified for systemic toxicity, and post-application inhalation exposure is expected to be negligible, no occupational post-application exposure and risk assessment is warranted.

**7. Human Incident Data**

Relatively few incidents of illness have been reported due to napropamide. However, it appears to be irritating to eyes and skin and has been associated with difficulty breathing when used in enclosed spaces. The following data bases have been consulted for the poisoning incident data on the active ingredient napropamide.

The Agency’s Incident Data System (IDS) contains reports of incidents from various sources since 1992. These reports represent anecdotal reports or allegations only, unless otherwise stated. Typically no conclusions can be drawn implicating the pesticide as a cause of
the reported health effect. In the case of napropamide, IDS reported 2 incidents. One user accidentally ingested the product and reportedly had symptoms of oral burns, laryngeal swelling, and excess secretions. The other user was exposed working in a greenhouse and had difficulty breathing and pain in the chest. No further information on the disposition of either case was reported.

A total of six exposures were reported to Poison Control Centers for the nine year period 1993-2001. Three of these cases reported minor symptoms, primarily dermal irritation. 20 cases were reported to the California Pesticide Illness Surveillance Program (1998-2002). In nine of these cases, napropamide was determined to be the primary cause of illness. The principle symptoms reported involved irritation of the eyes.

For the National Institute of Occupational Safety and Health, out of the 4,221 reported cases from 1998-2002, just two involved napropamide alone. In a Florida case, the worker splashed napropamide on himself and developed blisters. A Texas case reported a user having difficulty breathing when using napropamide in an enclosed area. Both cases were considered probable with no more than moderate severity.

No recommendations are being made on napropamide incidents, based on the very limited data available for this pesticide.

B. Environmental Risk Assessment

A summary of the Agency’s environmental risk assessment for napropamide is presented below. More detailed information associated with the environmental risk from the use of napropamide can be found in the “EFED Risk Assessment for the Napropamide Reregistration Eligibility Document, dated August 15, 2005. In a memorandum entitled “EFED RED Chapter for Napropamide Chronic Risk Recalculation for Mammals” dated September 21, 2005, the Agency corrected a toxicity endpoint that resulted in lower chronic mammal RQs. However, this change had little impact on the ecological risk conclusion. This RED reflects the changes outlined in the memo. The complete environmental risk assessment and the memo mentioned above may be accessed in the OPP Public Docket OPP-2004-0162 and on the Agency’s website at http://www.epa.gov/pesticides/reregistration/status.htm.

1. Environmental Exposure

   a. Environmental Fate and Transport

The environmental hazard and fate database is sufficient to characterize the environmental risks associated with napropamide use. However, EPA intends to issue a DCI following this RED to require submission of additional data for napropamide to address areas of uncertainty. These data are expected to confirm the conclusions of this environmental risk assessment and the Agency’s reregistration eligibility decision.
Based on laboratory studies, it is expected that napropamide will be persistent in the terrestrial environment resulting in the potential for the chemical to reach the aquatic environment by runoff. Additionally, because laboratory metabolism studies demonstrate a half-life of approximately 446 days, there is a potential for napropamide to accumulate in the soil with repeated applications. However, field dissipation studies (where napropamide was soil incorporated in various countries) indicate much faster dissipation rates on the order of 17 to 24 days (US) 46 to 131 days (W. Germany), 15 to 51 days (Canada). Although napropamide can photodegrade in water, this route of degradation is expected to be slowed when soil incorporation occurs at time of application. In addition, any napropamide that reaches surface water will tend to partition to suspended soils and sediment, thereby reducing the amount available to undergo photolysis. Napropamide is not expected to be bioaccumulative. The major terminal degradate in terrestrial environments is carbon dioxide, but photodegradation in aquatic systems creates isomers of the parent compound.

Napropamide is expected to have moderate to low mobility in soil based upon batch equilibrium studies showing adsorption coefficient values between 3 to 15 ml/g. Adsorption of napropamide to soil increases with increasing clay content, organic carbon content, and pH. Napropamide is not expected to volatilize from dry soil surfaces based upon its vapor pressure of 1.7 x 10^-7 mm Hg.

Napropamide photodegrades on soil with a half-life of 28 days. The major degradate is carbon dioxide. However, it is important to note that napropamide must be incorporated into the soil within one to 21 days of application in order to be efficacious; therefore, photodegradation on soil may not be a major route of dissipation.

In water, napropamide is expected to adsorb to suspended solids and sediment. Napropamide is stable to hydrolysis at pH 5, 7, and 9, but undergoes rapid direct photolysis in water with a half-life of 6.8 minutes for the parent compound napropamide. Identified degradates were Isomer I and Isomer II (propionamide). The two isomers also degrade rapidly, as the total residue (napropamide plus Isomers I and II) half-life in the photodegradation in water study was only 26 minutes. Because of light attenuation, aqueous photolysis will be an important pathway only in shallow, clear water bodies. Binding to suspended solids and sediment can also diminish the role photolysis plays in the degradation of napropamide. Neither volatilization from water nor biocoaccumulation are expected to be important fate processes.

b. Aquatic Organism Exposure

For exposure to aquatic fish and invertebrates, EPA considers surface water only, since most aquatic organisms are not found in ground water. Surface water models are used to estimate exposure to freshwater aquatic animals. The modeling results used in risk calculations for napropamide are detailed in the EFED chapter.

Unlike the drinking water assessment described in the human health risk assessment
section of this document, the ecological water resource assessment does not include the Index Reservoir (IR) and Percent-Crop Area (PCA) factor refinements. The IR and PCA factors represent a drinking water reservoir, not the variety of aquatic habitats, such as ponds adjacent to treated fields, relevant to a risk assessment for aquatic animals. Therefore, the EEC values used to assess exposure to aquatic animals are not the same as the values used to assess human dietary exposure from drinking water.

The Agency modeled surface water exposure using the Tier II Surface Water Computer model PRZM-EXAMS. Using PRZM-EXAMS, the Agency modeled a variety of crops where scenarios existed, use data were available, maximum application rates were highest, and geographical distribution of the crops were covered. Because the label does not specifically require soil incorporation at the time of application, EECs in the aquatic environment were determined assuming both soil incorporation and no soil incorporation at the time of application. The modeled surface water scenarios addressed the geographical distribution of specific crops in the US and the associated weather extremes. For example, citrus was modeled both in California and Florida, and apples were modeled in Oregon, North Carolina and Pennsylvania. Berries (e.g. blackberries and raspberries) were modeled in Oregon (Pacific Northwest). Pecans were modeled in Georgia, which created the highest estimates of water concentrations (See Table 8). EPA modeled cranberries based on a model designed to evaluate water concentrations for rice. See the EFED risk assessment for a complete listing of scenarios which were modeled. The resulting estimated environmental concentrations (EECs) from PRZM-EXAMS are presented in the table below.

<table>
<thead>
<tr>
<th>Crop/Scenario</th>
<th>EECs of Napropamide in Surface Water (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Peak</td>
</tr>
<tr>
<td>GA Pecan (6 lbs ai/A x1)</td>
<td>209.4</td>
</tr>
<tr>
<td>GA Pecan (4 lbs ai/A x 2)</td>
<td>156</td>
</tr>
<tr>
<td>GA Pecan (2 lbs ai/A x 1) Banded</td>
<td>69.7</td>
</tr>
<tr>
<td>GA Pecan (1 lbs ai/A x 2) Banded</td>
<td>52.3</td>
</tr>
</tbody>
</table>

**c. Terrestrial Organism Exposure**

The Agency assessed exposure to terrestrial organisms by first predicting the amount of napropamide residues found on animal food items and then by determining the amount of pesticide consumed by using information on typical food consumption by various species. Terrestrial wildlife exposure estimates are typically calculated for birds and mammals,
emphasizing a dietary exposure route for uptake of pesticide active ingredients. These exposures are considered as surrogates for terrestrial-phase amphibians as well as reptiles. For exposures to terrestrial organisms, such as birds and mammals, pesticide residues on food items are estimated based on the assumption that organisms are exposed to a single pesticide residue in a given exposure scenario. The application methods for napropamide are ground applications only (ground spray, chemigation, and granular broadcast). Because the label does not require immediate soil incorporation at the time of application (up to 3 weeks), EECs in the terrestrial organisms were determined assuming both soil incorporation and no soil incorporation at the time of application.

**Granular Applications**

Napropamide is applied to crops in granular form. Birds may be exposed to granular pesticides by ingesting granules when foraging for food or grit. However, an avian risk assessment was not performed for napropamide because the avian toxicity profile showed that napropamide is not toxic to birds. Mammalian species may be exposed by walking on exposed granules or drinking water contaminated by granules. However, EPA does not currently assess chronic risks to mammals from granular applications because the Agency assumes that granular formulations disperse and disintegrate over a short period of time.

**Spray Applications and Residues**

For napropamide spray applications, estimation of pesticide concentrations in wildlife food items focuses on quantifying possible dietary ingestion of residues on vegetative matter and insects. The residue estimates are based on a nomogram that relates food item residues to pesticide application rate. The estimated environmental concentrations (EECs) are generated from a spreadsheet-based model (T-REX) that calculates the decay of a chemical applied to foliar surfaces for single or multiple applications.

The terrestrial exposure assessment is based on the methods of Hoerger and Kenaga (1972) as modified by Fletcher *et al.* (1994). Terrestrial EECs for liquid formulations were derived for representative major crops using current application rates and intervals between applications where applicable.

The EECs on food items may be compared directly with dietary toxicity data (as is the case for birds - acute and chronic RQ calculations; chronic RQ calculations for mammals) or converted to an oral dose (as is the case for and small mammals). The screening-level risk assessment for napropamide uses upper bound predicted residues as the measure of exposure. The predicted maximum residues of napropamide that may be expected to occur on selected avian or mammalian food items immediately following application are presented in table 9.

**Table 9: Upper Bound EECs of Napropamide on Mammalian Food Items**
## Application rate Estimated Environmental Concentration (EEC) (ppm)

<table>
<thead>
<tr>
<th>Application rate</th>
<th>Estimated Environmental Concentration (EEC) (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short grass</td>
</tr>
<tr>
<td>6 lbs ai/A x 1 (broadcast)</td>
<td>1140</td>
</tr>
<tr>
<td>6 lbs ai/A x 1 (banded)</td>
<td>480</td>
</tr>
<tr>
<td>4 lbs ai/A x 2 (broadcast)</td>
<td>1253</td>
</tr>
<tr>
<td>4 lbs ai/A x 1 (broadcast)</td>
<td>960</td>
</tr>
<tr>
<td>3 lbs ai/A x 2 (broadcast)</td>
<td>939</td>
</tr>
<tr>
<td>2 lbs ai/A x 2 (broadcast)</td>
<td>480</td>
</tr>
<tr>
<td>2 lbs ai/A x 1 (banded)</td>
<td>160</td>
</tr>
<tr>
<td>1.33 lbs ai/A x 2 (banded)</td>
<td>137</td>
</tr>
<tr>
<td>1 lbs ai/A x 1 (broadcast)</td>
<td>240</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application interval of 60 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average napropamide use rate on tobacco</td>
</tr>
</tbody>
</table>

EECs for avian diets are not presented because napropamide is essentially non-toxic to birds.

### d. Non-target Terrestrial Plant Exposure

Terrestrial plants in dry and semi-aquatic (wetland) areas may be exposed to pesticides from runoff and/or spray drift. EPA used the TERRPLANT model to estimate napropamide residues in areas adjacent to the treated field (sheet runoff), wetland areas (channelized runoff), and from spray drift.

Screening level TERRPLANT modeling uses the maximum single application rate of the different types of uses (orchards and vineyards at 6 lbs ai/A, vineyards at 6 lbs ai/A, and row crops at 2 and 4 lbs ai/A), as well as the lowest average napropamide use rate of 1 lb ai/A (tobacco). Napropamide products (both granular and liquid) specify incorporation by either wetting in or mechanical means. Consequently, the Agency modeled risk to terrestrial plants assuming incorporation of 2 to 4 inches of depth to bracket potential exposure. These depths are specified in labels as being minimum depths to incorporate applied napropamide. Incorporation to 4-inch depth resulted in slightly lowered EECs as compared to the 2-inch incorporation. Selected results are included in Table 10. For additional estimates, please see the environmental risk assessment.
### Table 10: Napropamide Terrestrial Plant EECs for Non-Target Vascular Plants

<table>
<thead>
<tr>
<th>Crop/ scenario</th>
<th>Form</th>
<th>Application</th>
<th>Adjacent Area Runoff</th>
<th>Wetland Area Runoff</th>
<th>Spray Drift</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 lbs ai./acre</td>
<td>Liquid</td>
<td>Ground Unincorp.</td>
<td>0.18</td>
<td>1.26</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ground Incorp. (2 in.)</td>
<td>0.12</td>
<td>0.66</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spray Chemigation</td>
<td>0.37</td>
<td>1.2</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Granular</td>
<td>Ground Unincorp.</td>
<td>0.12</td>
<td>1.2</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ground Incorp. (2 in.)</td>
<td>0.06</td>
<td>0.6</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ground Incorp. (4 in.)</td>
<td>0.03</td>
<td>0.30</td>
<td>N/A</td>
</tr>
<tr>
<td>1.33 lbs ai/acre</td>
<td>Liquid</td>
<td>Ground Unincorp.</td>
<td>0.04</td>
<td>0.28</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ground Incorp. (2 in.)</td>
<td>0.03</td>
<td>0.15</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spray Chemigation</td>
<td>0.08</td>
<td>0.23</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Granular</td>
<td>Ground Unincorp.</td>
<td>0.03</td>
<td>0.30</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ground Incorp. (2 in.)</td>
<td>0.013</td>
<td>0.13</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ground Incorp. (4 in.)</td>
<td>0.007</td>
<td>0.07</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### 2. Environmental Effects (Toxicity)

#### a. Toxicity to Aquatic and Terrestrial Organisms

Napropamide is classified as practically non-toxic to avian species on both an acute oral and subacute dietary basis; is practically non-toxic to mammalian species on an acute oral basis; is moderately toxic to freshwater fish; is slightly toxic to freshwater invertebrates; is slightly toxic to estuarine/marine fish; and is moderately toxic to estuarine/marine invertebrates.
### Table 11: Summary of Napropamide Acute Aquatic Toxicity Data

<table>
<thead>
<tr>
<th>Species</th>
<th>Acute Toxicity</th>
<th>Chronic Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LC₅₀ or EC₅₀</td>
<td>MRID</td>
</tr>
<tr>
<td>Rainbow Trout <em>Oncorhynchus mykiss</em></td>
<td>6.4</td>
<td>115313</td>
</tr>
<tr>
<td>Water Flea <em>Daphnia magna</em></td>
<td>14.3</td>
<td>88064/57805</td>
</tr>
<tr>
<td>Sheepshead Minnow <em>Cyprinodon variegatus</em></td>
<td>14</td>
<td>416102-06</td>
</tr>
<tr>
<td>Eastern Oyster <em>Crassostrea virginica</em></td>
<td>1.4</td>
<td>416671-01</td>
</tr>
<tr>
<td>Mysid Shrimp <em>Americamysis bahia</em></td>
<td>4.2</td>
<td>416102-07</td>
</tr>
</tbody>
</table>

### Table 12: Summary of Napropamide Acute and Chronic Terrestrial Organism Toxicity Data

<table>
<thead>
<tr>
<th>Species</th>
<th>Acute Toxicity</th>
<th>Chronic Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oral Toxicity</td>
<td>Subacute Dietary</td>
</tr>
<tr>
<td></td>
<td>LD₅₀ (mg ai/kg)</td>
<td>LC₅₀ (mg ai/kg)</td>
</tr>
<tr>
<td>Mallard Duck <em>Anas platyrhynchos</em></td>
<td>&gt;4640</td>
<td>&gt;5620</td>
</tr>
<tr>
<td>Laboratory Rat <em>Rattus norvegicus</em></td>
<td>&gt;5000</td>
<td>NA</td>
</tr>
<tr>
<td>Honey Bee <em>Apis mellifera</em> (AI/bee)</td>
<td>&gt;113.5 ug</td>
<td>464591-15</td>
</tr>
</tbody>
</table>

¹ Accession number
² The effect demonstrated on body weight was deemed not related to the toxicant effects of napropamide.

### Table 13: Summary of Napropamide Most Sensitive Plant Toxicity Endpoints
### b. Ecological Risk Estimation (RQs)

The Agency’s ecological risk assessment compares toxicity endpoints from ecological toxicity studies to estimated environmental concentrations (EECs) based on environmental fate characteristics and pesticide use data. To evaluate the potential risk to non-target organisms from the use of napropamide products, the Agency calculates a Risk Quotient (RQ), which is the ratio of the EEC to the most sensitive toxicity endpoint values, such as the median lethal dose (LD₅₀) or the median lethal concentration (LC₅₀). These RQ values are then compared to the Agency’s levels of concern (LOCs), given in Table 14, which indicate whether a pesticide, when used as directed, has the potential to cause adverse effects on non-target organisms. When the RQ exceeds the LOC for a particular category (e.g., endangered species), the Agency presumes a risk of concern to that category. These risks of concern may be addressed by further refinements of the risk assessment or mitigation. Use, toxicity, fate, and exposure are considered when characterizing the risk, as well as the levels of certainty and uncertainty in the assessment. EPA further characterizes ecological risk based on any reported incidents to non-target terrestrial or aquatic organisms in the field (e.g., fish or bird kills).

### Table 14: EPA’s Levels of Concern and Associated Risk Presumptions.

<table>
<thead>
<tr>
<th>If RQ &gt; LOC value given below......</th>
<th>Then EPA presumes ......</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial Organisms</td>
<td>Aquatic Organisms</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>
If RQ > LOC value given below...... Then EPA presumes ......

<table>
<thead>
<tr>
<th>Terrestrial Organisms</th>
<th>Aquatic Organisms</th>
<th>Plants</th>
<th>Risk Presumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>0.1</td>
<td>N/A</td>
<td><strong>Acute Restricted Use</strong> - there is potential for acute risk, but may be mitigated through restricted use classification.</td>
</tr>
<tr>
<td>0.1</td>
<td>0.05</td>
<td>1</td>
<td><strong>Acute Endangered Species</strong> - endangered species may be adversely affected; regulatory action may be warranted.</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>N/A</td>
<td><strong>Chronic Risk</strong> - there is potential for chronic risk; regulatory action may be warranted.</td>
</tr>
</tbody>
</table>

For a more detailed explanation of the ecological risks posed by the use of napropamide, refer to *EFED Risk Assessment for the Napropamide Reregistration Eligibility Document*, dated August 15, 2005.

1. **Risk to Aquatic Organisms**

**Fish and Aquatic Invertebrates**

Acute RQ values for estuarine/marine invertebrates were all \( \leq 0.16 \). The highest RQs were estimated for Florida citrus and Georgia pecan scenarios. No LOCs were exceeded for chronic risks to aquatic organisms based on limited data. EPA has determined that additional chronic toxicity data should be submitted because of the potential environmental persistence of napropamide which may cause chronic exposure to aquatic organisms.

**Table 15: Acute Risk Quotients (RQ) for Estuarine/Marine Animals**

<table>
<thead>
<tr>
<th>Crop Scenario</th>
<th>Application</th>
<th>Estuarine/Marine Invertebrates RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL Citrus</td>
<td>4 lbs ai/A x 2 (broadcast)</td>
<td>0.16</td>
</tr>
<tr>
<td>GA Pecan</td>
<td>4 lbs ai/A x 2 (broadcast)</td>
<td>0.111</td>
</tr>
<tr>
<td></td>
<td>6 lbs ai/A x 1 (broadcast)</td>
<td>0.15</td>
</tr>
</tbody>
</table>

**Aquatic Plants**

RQs calculated for algae and non-listed aquatic vascular plants did not exceed EPA’s level of concern for any uses of napropamide.

2. **Risk to Non-target Terrestrial Organisms**
Birds

Toxicity data classify napropamide as practically nontoxic to birds. Therefore, avian environmental dietary exposure to napropamide is not expected to cause significant acute and chronic risks to birds.

Mammals

Acute RQs for mammals were below the Agency’s level of concern. Chronic RQs exceeded LOCs for mammals of all weights assessed. The majority of exceedences occurred for scenarios that evaluate mammals feeding on short grass, tall grass, and broadleaf plants/small insects. However, a few exceedences were estimated for mammals that feed on fruits/pods/large insects when the higher application rates are considered.

Table 16: Mammalian Chronic RQ Values for Napropamide

<table>
<thead>
<tr>
<th>Application rate</th>
<th>Mammalian Chronic Risk Quotients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short grass</td>
</tr>
<tr>
<td>6 lbs ai/A x 1 (broadcast)</td>
<td>9.5 - 21</td>
</tr>
<tr>
<td>6 lbs ai/A x 1 (banded)</td>
<td>3.2 - 6.9</td>
</tr>
<tr>
<td>4 lbs ai/A x 2 (broadcast)</td>
<td>8.3 - 18</td>
</tr>
<tr>
<td>4 lbs ai/A x 1 (broadcast)</td>
<td>6.4 - 14</td>
</tr>
<tr>
<td>3 lbs ai/A x 2 (broadcast)</td>
<td>6.2 - 14</td>
</tr>
<tr>
<td>2 lbs ai/A x 1 (broadcast)</td>
<td>3.2 - 6.9</td>
</tr>
<tr>
<td>2 lbs ai/A x 1 (banded)</td>
<td>1.1 - 2.3</td>
</tr>
<tr>
<td>1.33 lbs ai/A x 2 (banded)</td>
<td>0.9 - 2.0</td>
</tr>
<tr>
<td>1 lb ai/A x 13 (broadcast)</td>
<td>1.6 - 3.5</td>
</tr>
</tbody>
</table>

1Lowest average use rate (tobacco) exceedances indicated in bold

Non-Target Insects

EPA currently does not routinely quantify risks to terrestrial non-target insects; therefore, risk quotients are not calculated for these organisms. Since napropamide is practically non-toxic to honey bees (LD₅₀ > 113.5 ug ai/bee) the potential for napropamide to have adverse effects on pollinators and other beneficial insects is low.

Non-target Terrestrial Plants
Terrestrial plant risks were evaluated by RQ calculation for seedling emergence for non-endangered terrestrial and wetland/riparian plants (monocot and dicot) from sheet and channelized run-off. Vegetative vigor risks were evaluated for non-endangered terrestrial and wetland/riparian plant (monocot and dicot) from spray drift calculations. The Agency’s plant LOC of 1.0 was exceeded at all application rates evaluated (6, 4, 2, 1 lb and 1.33 ai/A) with dicots generally showing more sensitivity than monocots. RQs for plants in areas adjacent to treated fields exceeded LOCs at all modeled application rates at different depths of incorporation with RQs ranging up to 12.

For endangered species, wetland plant risks were identified at all application rates and application methods modeled, with one exception (1 lb ai/A liquid application, incorporated to 4 inches). Plant risks were identified under all scenarios for the highest application rates modeled (6 lbs ai/A and 4 lbs ai/A), with the exception of monocots exposed to granular applications incorporated to 4 inches.

For a complete listing of other rates, please refer to EFED Risk Assessment for the Napropamide Reregistration Eligibility Document, dated August 15, 2005

3. Ecological Incidents

EPA completed a review of the EIIS database for ecological incidents involving napropamide. There were two reported incidents. The first incident involved adverse effects on fish (incident # 1000799-04). Napropamide and chlorpyrifos residues were identified in soil in the vicinity of a fish pond. The report deemed chlorpyrifos as a more probable reason for the incident than napropamide due to chlorpyrifos’ high toxicity to fish. Napropamide is only slightly to moderately toxic to fish. The second incident report involved damage to seven acres of planted Douglas fir trees. The report concluded that napropamide was not likely the cause of the damage because it had only been applied once to the area. Oryzalin, which was used in the vicinity of the tree damage, was determined to be the likely cause of the damage; the oryzalin label specifically warns that it could damage Douglas fir trees.

4. Endangered Species Concerns

EPA's ecological risk assessment concludes that RQs did not exceed an acute LOC for direct effects (no effect) from uses of napropamide to the following listed species: insects, birds, terrestrial phase amphibians, reptiles, freshwater fish, aquatic phase amphibians, freshwater crustaceans and marine/estuarine fish. Further, RQs did not exceed a chronic LOC for direct effects (no effect) for: insects, birds, terrestrial phase amphibians, reptiles, freshwater fish, aquatic phase amphibians, and freshwater crustaceans. Based on EPA’s screening level assessment and as noted below, RQs for napropamide exceed acute levels of concern for direct effects to endangered species of mammals, mollusks, marine/estuarine crustaceans, aquatic vascular plants and terrestrial and semi-aquatic plants (both dicots and monocots). RQs were also exceeded for
chronic direct effects to mammals. While there are no chronic data on which to assess the potential for chronic effects to mollusks, marine/estuarine fish and marine/estuarine crustaceans, chronic NOAECs could be estimated for marine/estuarine fish and crustaceans using acute to chronic ratios derived using acute and chronic rainbow trout and daphnia toxicity results. These estimates would indicate the potential for 21-day EEC's to exceed LOC's for chronic concerns.

The screening level assessment for napropamide resulted in acute endangered species risks RQs above EPA’s level of concern for marine/estuarine mollusks under several scenarios including Florida citrus, Oregon filbert, Pennsylvania apple, North Carolina apple, Georgia pecan, Florida tomato, and Florida pepper. Listed species RQs for aquatic invertebrates exceeded the LOC in only one scenario for marine/estuarine crustaceans (Florida citrus, 4 lbs ai/A applied twice). Also, the LOC is exceeded for endangered vascular aquatic plants under several scenarios. Chronic mammalian RQ values exceeded the LOC on grasses, broadleaf plants, and small insects at all modeled rates. Listed wetland plant risks were identified at all application rates and application methods modeled, with one exception (1 lb ai/A liquid application, incorporated to 4 inches). In addition, listed terrestrial plant risks were identified under all scenarios for the highest application rates modeled (6 lbs ai/A and 4 lbs ai/A), with the exception of monocots exposed to granular applications incorporated to 4 inches. At lower application rates (2, 1.33, and 1 lb ai/A), exceedances occurred for listed terrestrial plants under most scenarios. Additionally, there is a potential for indirect effects on any listed species that is either dependent upon mammals and/or dependent upon terrestrial and semi-aquatic plants, aquatic vascular plants, mollusks, and marine/estuarine crustaceans and occurs within areas where exposure is sufficient to produce adverse effects on these species mammals and/or terrestrial plants.

5. Risk Characterization

The environmental risks for napropamide were based on a screening-level assessment to both terrestrial and aquatic environments from labeled uses of the chemical. The assessment was performed on geographic areas where the highest use rates and expected exposures are likely to occur. Results show some concerns for terrestrial and wetland/riparian plants (which are not unexpected due to the herbicidal nature of the compound), as well as some chronic risks to mammals. This is a screening-level assessment, and therefore, results should be considered conservative in nature. For example, upper-end risk values estimated in the assessment do not take into account some key cultural practices, such as banded applications, which greatly reduce the total amount of napropamide applied per acre. Also, this assessment does not account for the common technique of using plastic tarpaulins to cover the area directly below the crop to keep fruit and vegetables from contacting the soil. These tarpaulins likely reduce the extent of napropamide exposure to mammals following application of both granular and liquid formulations.

Additionally, where data were not available for evaluation, the Agency used conservative assumption values to calculate residue estimates for ecological assessment. Laboratory data indicated napropamide persistence, but field dissipation data from outside the United States,
indicated dissipation of approximately two months or less. Also, no foliar dissipation data were available, so a default half-life of 35 days was used to predict foliar residues for chronic risk calculations.

EPA modeled an application interval of 60 days for all scenarios with multiple applications. The use of 60 days is in accordance with labels for napropamide applied to turf and ornamentals. The Agency also believes that the 60-day interval is appropriate for the other crops with multiple applications.

The Agency recognizes that in many situations pre-emergence herbicides such as napropamide may be banded instead of broadcasted to an entire field. Therefore, EPA modeled potential exposure to plant and animals using both the maximum labeled rate(s) and “typical” banded rates (1.33 lbs ai/A). The 1.33 pound rate came from the 4 pound ai/A rate divided by 3 to account for banding treatment in the field.

The cranberry scenario resulted in exceedances of the Agency’s LOCs from peak estimates for aquatic animals and plants. However, the concentration of napropamide in water degrades within 1 hour. Therefore, flood water released into the surrounding aquatic habitats is not expected to pose a significant risk to aquatic organisms in these environments.

Avian risk assessments were not conducted for napropamide use because acute toxicity studies classified napropamide as practically nontoxic to birds. Furthermore, no chronic avian endpoint of concern was identified from available studies.

IV. Risk Management, Reregistration, and Tolerance Reassessment Decision

A. Determination of Reregistration Eligibility

Section 4(g)(2)(A) of FIFRA calls for the Agency to determine, after submission of relevant data concerning an active ingredient, whether or not products containing the active ingredient are eligible for reregistration. The Agency has previously identified and required the submission of the generic (i.e., active ingredient-specific) data to support reregistration of products containing napropamide as an active ingredient. The Agency has completed its review of these generic data, and has determined that the data are sufficient to support reregistration of all products containing napropamide.

The Agency has completed its assessment of the dietary, residential, occupational, and ecological risk associated with the use of pesticide products containing the active ingredient napropamide from all sources. Based on a review of these data and on public comments on the Agency’s assessments for the active ingredient napropamide, the Agency has sufficient information on the human health and ecological effects of napropamide to make decisions as part of the tolerance reassessment process under FFDCA and reregistration process under FIFRA, as amended by FQPA. The Agency has determined that napropamide containing products are
eligible for reregistration provided that: (i) the risk mitigation measures outlined in this document are adopted; and (ii) label amendments are made to reflect these measures. Label changes are described in Section V. Appendix A summarizes the uses of napropamide that are eligible for reregistration. Appendix B identifies the generic data requirements necessary as part of the Agency’s determination of reregistration eligibility of napropamide, and lists the submitted studies that the Agency reviewed and found acceptable. Data gaps are identified as generic data requirements that have not been satisfied with acceptable data.

Based on its evaluation of napropamide, the Agency has determined that napropamide products, unless labeled and used as specified in this document, would present risks inconsistent with FIFRA and FQPA. Accordingly, should a registrant fail to implement any of the risk mitigation measures identified in this document, the Agency may take regulatory action to address the risk concerns from the use of napropamide. If all changes outlined in this document are incorporated into the product labels, then all current risks for napropamide will be adequately reduced for the purposes of this reregistration determination under FIFRA. Once an Endangered Species assessment is completed, further changes to these registrations may be necessary as explained in section IV, number 4 below.

B. Public Comments

Through the Agency’s public participation process, EPA worked extensively with stakeholders and the public to reach its regulatory decisions for napropamide. During Phase 3 of the public comment period on the risk assessments, which closed on May 5, 2005, the Agency received comments from the registrant, grower groups and a private citizen. The comments pertained to the importance of particular uses and urged the Agency to consider how it regulated these commodities. For example, the Northern California Mint Growers submitted comments on the importance of napropamide for mint, and Walters Garden, Inc. outlined how it uses napropamide to reduce its need for the fumigant methyl bromide. These comments in their entirety, and the Agency’s response, are available in the public docket (OPP-2004-0162) at http://www.epa.gov/edockets.

The RED and technical supporting documents for napropamide are available to the public through EPA’s electronic public docket and comment system, EPA Dockets, under docket identification (ID) number OPP-2004-0162. The public may access EPA Dockets at http://www.epa.gov/edockets. In addition, the napropamide RED document may be downloaded or viewed through the Agency’s website at http://www.epa.gov/pesticides/reregistration/status.htm.

C. Regulatory Position

1. Food Quality Protection Act Findings

   a. “Risk Cup” Determination
As part of the FQPA tolerance reassessment process, EPA assessed the risks associated with this pesticide. EPA has determined that risk from dietary (food and water) exposure to napropamide is within its own “risk cup.” An aggregate assessment was conducted for exposures to napropamide through food, drinking water, and residential uses. The Agency has determined that the human health risks from these combined exposures to napropamide are within acceptable levels. In other words, EPA has concluded that the tolerances for napropamide meet FQPA safety standards.

b. Determination of Safety to U.S. Population (including Infants and Children)

The Agency has determined that the established tolerances for napropamide, with amendments and changes as specified in this document, meet the safety standards under the FQPA amendments to section 408(b)(2)(D) of the FFDCA, and that there is a reasonable certainty no harm will result to the general population or any subgroup from the use of napropamide. In reaching this conclusion, the Agency has considered all available information on the toxicity, use practices and exposure scenarios, and the environmental behavior of napropamide.

c. Endocrine Disruptor Effects

EPA is required under the FFDCA, as amended by FQPA, to develop a screening program to determine whether certain substances (including all pesticide active and other ingredients) “may have an effect in humans that is similar to an effect produced by a naturally occurring estrogen, or other endocrine effects as the Administrator may designate.” Following recommendations of its Endocrine Disruptor Screening and Testing Advisory Committee (EDSTAC), EPA determined that there was a scientific basis for including, as part of the program, the androgen and thyroid hormone systems, in addition to the estrogen hormone system. EPA also adopted EDSTAC’s recommendation that EPA include evaluations of potential effects in wildlife. For pesticides, EPA will use FIFRA and, to the extent that effects in wildlife may help determine whether a substance may have an effect in humans, FFDCA authority to require the wildlife evaluations. As the science develops and resources allow, screening of additional hormone systems may be added to the Endocrine Disruptor Screening Program (EDSP).

In the toxicity studies on napropamide, there was no estrogen, androgen, and/or thyroid mediated toxicity. When additional appropriate screening and/or testing protocols being considered under the Agency’s EDSP have been developed, napropamide may be subjected to further screening and/or testing to better characterize effects related to endocrine disruption.

d. Cumulative Risks

Risks summarized in this document are those that result only from the use of napropamide. The Food Quality Protection Act (FQPA) requires that the Agency consider available information concerning the cumulative effects of a particular pesticide’s residues and
other substances that have a common mechanism of toxicity. The reason for consideration of other substances is due to the possibility that low-level exposures to multiple chemical substances that cause a common toxic effect by a common toxic mechanism could lead to the same adverse health effect as would a higher level of exposure to any of the substances individually. Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding for napropamide.

**D. Tolerance Reassessment Summary**

The napropamide tolerances listed under 40 CFR §180.328(a) and (b) are expressed in terms of N,N-diethyl-2-(1-naphthalenyloxy) propionamide. The tolerance expression is adequate. A summary of the tolerance reassessment and recommended modifications in commodity definitions for napropamide is presented in Table 18.

Although additional data are required to confirm the existing tolerance levels in/on the following commodities, the Agency has no dietary, drinking water or residential risk concerns associated with these tolerances and considers them reassessed: blackberry, blueberry, boysenberry, loganberry, raspberry, kiwi fruit, almonds, pecan, filbert, persimmon, and grape.

### Napropamide Table 18: Tolerance Reassessment Summary for Napropamide

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Current Tolerance (ppm)</th>
<th>Tolerance Reassessment (ppm)</th>
<th>Comment/ [Correct Commodity Definition]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tolerances Listed Under 40 CFR §180.328(a)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almond, hulls</td>
<td>0.1 (N)*</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Artichoke, globe</td>
<td>0.1</td>
<td>Proposed Revocation</td>
<td>This use is being proposed for cancellation.</td>
</tr>
<tr>
<td>Asparagus</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Avocado</td>
<td>0.1</td>
<td>Proposed Revocation</td>
<td>This use is being proposed for cancellation by the registrant.</td>
</tr>
<tr>
<td>Basil</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Marjoram</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Rosemary</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Savory, summer</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Savory, winter</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Coffee bean</td>
<td>0.1 (N)</td>
<td>0.1</td>
<td>Although the registrant stated that they do not intend to support this use because there are no U.S. registration for coffee bean, EPA intends to maintain this tolerance for import uses only.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Commodity</th>
<th>Current Tolerance (ppm)</th>
<th>Tolerance Reassessment (ppm)</th>
<th>Comment/ [Correct Commodity Definition]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fig</td>
<td>0.1 (N)</td>
<td>Proposed Revocation</td>
<td>This use is being proposed for cancellation.</td>
</tr>
<tr>
<td>Fruit, citrus</td>
<td>0.1 (N)</td>
<td>Proposed Revocation</td>
<td>[Fruit, citrus, group 10] These uses are being proposed for cancellation.</td>
</tr>
<tr>
<td>Fruit, pome</td>
<td>0.1 (N)</td>
<td>Proposed Revocation</td>
<td>These uses are being proposed for cancellation.</td>
</tr>
<tr>
<td>Fruit, small</td>
<td>0.1 (N)</td>
<td>TBD</td>
<td>The established group tolerance on “fruit, small” is based on an obsolete crop grouping. EPA is now recommending that upon submission of additional field trial data, the tolerance for &quot;fruit, small&quot; be revoked concomitant with the establishment of a separate tolerance for Berry group 13, cranberry, grape, and strawberry. [Berry, group 13]</td>
</tr>
<tr>
<td>Fruit, stone</td>
<td>0.1 (N)</td>
<td>Proposed Revocation</td>
<td>These uses are being proposed for cancellation.</td>
</tr>
<tr>
<td>Kiwifruit</td>
<td>0.1</td>
<td>TBD</td>
<td>Additional residue field trial data are required.</td>
</tr>
<tr>
<td>Mint</td>
<td>0.1</td>
<td>0.1</td>
<td>[peppermint, tops and spearmint, tops]</td>
</tr>
<tr>
<td>Nut</td>
<td>0.1 (N)</td>
<td>TBD</td>
<td>Additional field trial data are required for almonds, pecans, and filbert. The remaining uses on nuts are being proposed for cancellation.***</td>
</tr>
<tr>
<td>Olive</td>
<td>0.1</td>
<td>Proposed Revocation</td>
<td>This use is being proposed for cancellation.</td>
</tr>
<tr>
<td>Persimmon</td>
<td>0.1</td>
<td>TBD</td>
<td>Additional data are required.</td>
</tr>
<tr>
<td>Pistachio</td>
<td>0.1</td>
<td>Proposed revocation</td>
<td>This use is being proposed for cancellation.</td>
</tr>
<tr>
<td>Rhubarb</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Sweet potato, roots</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Vegetable, brassica, leafy, group 5</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Vegetable, cucurbit, group 9</td>
<td>0.1</td>
<td>Revoke</td>
<td>There are presently no registered uses of napropamide on cucurbit vegetables. Unless the basic registrants or other interested parties support these uses and develop supporting data, the established tolerance will be revoked.</td>
</tr>
<tr>
<td>Vegetable, fruiting</td>
<td>0.1 (N)</td>
<td>0.1</td>
<td>[Vegetable, fruiting, group 8]</td>
</tr>
</tbody>
</table>

Tolerances to be Established Under CFR §180.328(a)
Commodity    | Current Tolerance (ppm) | Tolerance Reassessment (ppm) | Comment/ [Correct Commodity Definition]
Berry, group 13 | -- | TBD | The established group tolerance on “fruit small” is based on an obsolete crop grouping. EPA is now recommending that the tolerance for “fruit, small” be revoked concomitant with the establishment of separate tolerances for cranberry and strawberry, and upon submission of additional field trial data, for Berry group 13 and grape.
Cranberry | -- | 0.1 |
Grape | -- | TBD |
Strawberry | -- | 0.1 |

Tolerances Listed Under 40 CFR §180.328(b)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Current Tolerance (ppm)</th>
<th>Proposed Revocation</th>
<th>Comment</th>
</tr>
</thead>
</table>
Pomegranate | 0.1 | | This use is being proposed for cancellation.

* Negligible Residues
** TBD - To be determined following review of the data being required herein.
*** The use on walnut will be cancelled. Uses on almonds, pecan, and filbert will remain

a. **Codex Harmonization**

No Codex or Canadian MRLs have been established for residues of napropamide.

E. **Regulatory Rationale**

The following is a summary of the rationale for the mitigation measures necessary for reregistration eligibility and for managing risks associated with the use of napropamide. Where labeling revisions are warranted, specific language is set forth in the summary table of Section V (Table 20 of this RED document).

1. **Human Health Risk Management**

   a. **Dietary (Food and Water) Risk Mitigation**

   Acute dietary risk was not assessed because there were no toxicological endpoints attributable to a single exposure. Chronic dietary (food and water) exposure and risk from napropamide are below Agency’s level of concern; therefore, no additional mitigation is required.

   b. **Residential Risk Mitigation**

   Residential exposures do not pose a risk of concern. Therefore, no additional mitigation measures to address residential risks are required for napropamide.

   c. **Aggregate Risk Mitigation**
Short term and chronic aggregate risks were below the Agency’s level of concern. Therefore, no additional mitigation measures are required.

d. Occupational Risk Mitigation

Short- and intermediate-term inhalation risks to occupational handlers scenarios are below the Agency’s level of concern (i.e., MOE ≥100). Therefore, no additional mitigation is needed.

EPA did not assess occupational postapplication risks to agricultural workers following treatments to agricultural crops with napropamide, since no dermal endpoint of concern was identified and because post application inhalation exposure is expected to be negligible once sprays and dusts have settled. Therefore, no mitigation measures are required. As a result, the general 12 hour REI, as established by the Worker Protection Standard, applies to all napropamide agricultural use products.

2. Environmental Risk Mitigation

No risks of concern (acute or chronic) are predicted for aquatic organisms; however, chronic toxicity data are limited and will be required as a follow-up to this RED. Napropamide is essentially non-toxic to birds. There were no exceedences for acute risk to mammals. However, the Agency has determined that napropamide may pose risks to mammals and plants. The Agency’s screening level risk assessment on napropamide shows chronic risk to mammals feeding on short grass, tall grass, broadleaf plants, small insects, fruits, pods, and large insects. At all modeled application rates, terrestrial and wetland/riparian plants exceed the Agency’s level of concern. The following mitigation will reduce ecological risks:

- Cancellation of the following uses: pistachio, walnut, grapefruit, lemon, nectarine, orange, tangerine, tangelo, apricot, cherry, peach, plum, prune, apple, pear, fig, avocado, pomegranate, artichoke, and olive.

- Limitation of the number of applications permitted to once per year for all remaining uses (except ornamentals).

- A decrease in the maximum application rate for almonds (8 to 4 lbs per year), pecans (8 to 4 lbs per year), cranberries (15 to 9 lbs per year), grapes (8 to 4 lbs per year), kiwi fruit (8 to 4 lbs per year), persimmons (8 to 4 lbs per year), and turf (6 to 2 lbs per year).

Table 19 identifies all remaining uses that will be permitted after the mitigation measures are put in place:

Table 19: Napropamide: Remaining Uses and Application Rates
<table>
<thead>
<tr>
<th>Site</th>
<th>New Maximum Rate (lb ai/A)</th>
<th>No App/year</th>
<th>Max Load/Year (lb ai/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tree Nuts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almond</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Pecan</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Filbert</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>Brassica Crops</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broccoli</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cabbage</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Asparagus</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Berries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blackberry</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Blueberry</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Boysenberry</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Loganberry</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Raspberry</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Strawberry</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Cranberry</td>
<td>9</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td><strong>Tropical Fruits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kiwi Fruit</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Persimmon</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>Fruiting Vegetables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggplant</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Pepper</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Tomato</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Additional Crops</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grapes</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
3. **Significance of Napropamide Use**

Napropamide is an important herbicide with key uses in several agricultural sectors. For ornamentals, it is significantly important in the Pacific Northwest. Although napropamide is only used on 1 percent of ornamentals nationally, in Washington it is used on 97 percent of the nursery-grown rhododendron and azalea crop. It also provides a critical niche for tomatoes and peppers since many alternatives are not labeled for pre-plant incorporated treatments that are needed for these production activities. It provides a niche for eggplant and tobacco to control weeds where other alternatives do not give adequate control. In addition, for a number of crops, napropamide is important to growers as they transition away from methyl bromide.

As already discussed in this RED document, the environmental risks for napropamide were based on a screening-level assessment for both terrestrial and aquatic environments. Results indicate some concerns for acute risks to terrestrial and wetland/riparian plants (which are not unexpected due to the herbicidal nature of the compound), as well as some chronic risks to mammals. In order to address these ecological risks, the Agency will require napropamide registrants to reduce the total napropamide used while still preserving many of the important uses of this chemical. Reduction of use, and subsequent reduction of ecological exposure, will result from a combination of voluntary cancellations, lowering the use rate of several crops and limiting the number of applications per year for most crops (See Table 19 for specifics on the new uses and use rates). As a result of these mitigation measures, the amount of napropamide exposure to
plant, animal, and water resources is lowered therefore, limiting the amount that is released into the environment.

4. Endangered Species Considerations

Based on EPA’s screening level assessment, RQs for napropamide exceed acute levels of concern for direct effects to endangered species of mammals, mollusks, marine/estuarine crustaceans, aquatic vascular plants and terrestrial and semi-aquatic plants (both dicots and monocots). RQs were also exceeded for chronic direct effects to mammals. Further, based on screening level assessments of potential direct effects to these taxa, the potential for indirect effects to all taxa of listed species can not be precluded at this time. These findings are based solely on EPA’s screening level assessment and do not constitute “may affect” finding under the Endangered Species Act.

The Agency has developed the Endangered Species Protection Program to identify pesticides whose use may cause adverse impacts on endangered and threatened species, and to implement mitigation measures that address these impacts. The Endangered Species Act requires federal agencies to ensure that their actions are not likely to jeopardize listed species or adversely modify designated critical habitat. To analyze the potential of registered pesticide uses to affect any particular species, EPA puts basic toxicity and exposure data developed for reregistration eligibility decisions into context for individual listed species and their locations by evaluating important ecological parameters, pesticide use information, the geographic relationship between specific pesticide uses and species locations and biological requirements and behavioural aspects of the particular species. When conducted, this analysis will consider regulatory changes recommended in this RED that are being implemented at that time. A determination that there is a likelihood of potential impact to a listed species may result in limitations on use of the pesticide, other measures to mitigate any potential impact, or consultations with the Fish and Wildlife Service or National Marine Fisheries Service as necessary. If the Agency determines use of napropamide “may affect” listed species or their designated critical habitat, EPA will employ the provisions in the Services regulations (50 CFR Part 402).

EPA is not requiring specific napropamide label language at the present time relative to threatened and endangered species. If in the future, specific measures are necessary for the protection of listed species, the Agency will implement them through the Endangered Species Protection Program. Until that species specific analysis is completed, the risk mitigation measures being implemented through this RED will reduce the likelihood that endangered and threatened species may be exposed to napropamide at levels of concern.

F. Other Labeling Requirements

In order to be eligible for reregistration, various use and safety information will be included in the labeling of all end-use products containing napropamide. For the specific labeling statements and a list of outstanding data, refer to Section V of this RED document.
1. **Spray Drift Management**

The Agency has been working closely with stakeholders to develop improved approaches for mitigating risks to human health and the environment from pesticide spray and dust drift. As part of the reregistration process, EPA will continue to work with all interested parties on this important issue.

From its assessment of napropamide, as summarized in this document, the Agency concludes that no additional drift mitigation measures are needed for napropamide. In the future, napropamide product labels may need to be revised to include additional or different drift label statements.

V. **What Registrants Need to Do**

The Agency has determined that napropamide is eligible for reregistration provided that: (i) additional data are submitted to confirm this decision; (ii) the risk mitigation measures outlined in this document are adopted; and (iii) label amendments are made to reflect these measures. To implement the risk mitigation measures, the registrants will be required to amend their product labeling to incorporate the label statements set forth in the Label Summary Table in Section C below. In the near future, the Agency intends to issue Data Call-In Notices (DCIs) requiring label amendments, product specific data and additional generic (technical grade) data. Generally, registrants will have 90 days from receipt of a DCI to complete and submit response forms or request time extension and/or waiver requests with a full written justification. For product specific data, the registrant will have eight months to submit data and amended labels. For generic data, due dates can vary depending on the specific studies being required. Below are additional generic data and label amendments that the Agency intends to require for napropamide.

A. **Manufacturing-Use Products**

1. **Generic Data Requirements**

The generic data base supporting the reregistration of napropamide for the above eligible uses has been reviewed and determined to be substantially complete. However, the data listed below are necessary to confirm the reregistration eligibility decision documented in this RED.

860.1340    Residue Analytical Method - Plants.

860.1500    Crop Field Trials are required for the following commodities: berries, tree nuts, grape, kiwi fruit, and persimmon.

860.1520    Magnitude of Residue in Processed Food/Feed (Coffee and Mint).
2. Labeling for Manufacturing-Use Products

To ensure compliance with FIFRA, manufacturing use product (MUP) labeling should be revised to comply with all current EPA regulations, PR Notices, and applicable policies. The MUP labeling should bear the labeling contained in Table 20.

B. End-Use Products

1. Additional Product-Specific Data Requirements

Section 4(g)(2)(B) of FIFRA calls for the Agency to obtain any needed product-specific data regarding the pesticide after a determination of eligibility has been made. Registrants must review previous data submissions to ensure that they meet current EPA acceptance criteria and if not, commit to conduct new studies. If a registrant believes that previously submitted data meet current testing standards, then the study MRID numbers should be cited according to the instructions in the Requirement Status and Registrants Response Form provided for each product. The Agency intends to issue a separate product-specific data call-in (PDCI), outlining specific data requirements.
2. Labeling for End-Use Products

To be eligible for reregistration, labeling changes are necessary to implement measures outlined in Section IV above. Specific language to incorporate these changes is specified in Table 22. Generally, conditions for the distribution and sale of products bearing old labels/labeling will be established when the label changes are approved. However, specific existing stocks time frames will be established case-by-case, depending on the number of products involved, the number of label changes, and other factors.

D. Labeling Changes Summary Table

In order to be eligible for reregistration, amend all product labels to incorporate the risk mitigation measures outlined in Section IV. The following table (Table 20) describes how language on the labels should be amended.

In order to be eligible for reregistration, amend all product labels to incorporate the risk mitigation measures outlined in Section IV. The following table describes how language on the labels should be amended.
Labeling Changes Summary Table

In order to be eligible for reregistration, amend all product labels to incorporate the risk mitigation measures outlined in Section IV. The following table describes how language on the labels should be amended.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amended Labeling Language</th>
<th>Placement on Label</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturing Use Products</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One of these statements may be added to a label to allow reformulation of the product for a specific use or all additional uses supported by a formulator or user group</td>
<td>“Only for formulation into a dry flowable, granular, and liquid herbicide for the following use(s) [fill blank only with those uses that are being supported by MP registrant].”</td>
<td>Directions for Use</td>
</tr>
<tr>
<td></td>
<td>“This product may be used to formulate products for specific use(s) not listed on the MP label if the formulator, user group, or grower has complied with U.S. EPA submission requirements regarding support of such use(s).”</td>
<td>Directions for Use</td>
</tr>
<tr>
<td></td>
<td>“This product may be used to formulate products for any additional use(s) not listed on the MP label if the formulator, user group, or grower has complied with U.S. EPA submission requirements regarding support of such use(s).”</td>
<td>Directions for Use</td>
</tr>
<tr>
<td>Description</td>
<td>Amended Labeling Language</td>
<td>Placement on Label</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Environmental Hazards Statements Required by the RED and Agency Label Policies</td>
<td>&quot;Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollution Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.&quot;</td>
<td>Precautionary Statements</td>
</tr>
<tr>
<td>Description</td>
<td>Amended Labeling Language</td>
<td>Placement on Label</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>End Use Products Intended for Occupational Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPE Requirements Established by the RED¹ for products</td>
<td>“Personal Protective Equipment (PPE)”&lt;br&gt;“Mixers, loaders, applicators, and other handlers must wear:&lt;br&gt;Long-sleeved shirt and long pants&lt;br&gt;Chemical Resistant Gloves&lt;br&gt;Shoes plus socks.”</td>
<td>Immediately following/below Precautionary Statements: Hazards to Humans and Domestic Animals</td>
</tr>
<tr>
<td>Engineering Controls for Aerial Applicators</td>
<td>Pilots must use an enclosed cockpit that meets the requirements in the Worker Protection Standard</td>
<td>Precautionary Statements: Hazards to Humans and Domestic Animals (Immediately following PPE Requirements.)</td>
</tr>
<tr>
<td>User Safety Requirements</td>
<td>“Follow manufacturer’s instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.”</td>
<td>Precautionary Statements: Hazards to Humans and Domestic Animals (Immediately following PPE Requirements.)</td>
</tr>
<tr>
<td>User Safety Recommendations</td>
<td>User Safety Recommendations&lt;br&gt;Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.&lt;br&gt;Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.&lt;br&gt;Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing*. As soon as possible, wash thoroughly and change into clean clothing.”</td>
<td>Precautionary Statements immediately following User Safety Requirements (Must be placed in a box.)</td>
</tr>
</tbody>
</table>
### Table 11: Summary of Labeling Changes for Napropamide

<table>
<thead>
<tr>
<th>Description</th>
<th>Amended Labeling Language</th>
<th>Placement on Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Hazards</td>
<td>“Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.”</td>
<td>Precautionary Statements immediately following the User Safety Recommendations</td>
</tr>
</tbody>
</table>

Note: May need to be modified based on toxicity and use.
<table>
<thead>
<tr>
<th>Description</th>
<th>Amended Labeling Language</th>
<th>Placement on Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restricted-Entry Interval</td>
<td>“Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 24”</td>
<td>Directions for Use, Agricultural Use Requirements Box</td>
</tr>
</tbody>
</table>
| Early Re-entry Personal Protective Equipment established by the RED. | “PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:  
* coveralls,  
* shoes plus socks  
* chemical-resistant gloves made of any waterproof material  
* Eye wear” |                                  |
| Spray Drift                                      |                                                                                                                                                                                                                          | Directions for Use                 |
| General Precautions and Restrictions             | “Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.”                                                                 | Directions for Use                 |
### Table 11: Summary of Labeling Changes for Napropamide

<table>
<thead>
<tr>
<th>Description</th>
<th>Amended Labeling Language</th>
<th>Placement on Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Restrictions</td>
<td>End use product labels must be revised to delete all references to and use directions for the following cancelled uses: pistachio, walnut, grapefruit, lemon, nectarine, orange, tangerine, tangelo, apricot, cherry, peach, plum, prune, apple, pear, fig, avocado, pomegranate, artichoke, and olive.</td>
<td>Place in the Directions for Use under Application Instructions for Each Crop</td>
</tr>
<tr>
<td></td>
<td>The following risk mitigation measures must be reflected in the Directions for Use:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Almonds</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Maximum application rate per crop cycle: 4 pounds active ingredient per acre.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Apply a maximum of one application per year.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Pecans</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Maximum application rate per crop cycle: 4 pounds active ingredient per acre.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Apply a maximum of one application per year.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cranberries</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Maximum application rate per crop cycle: 9 pounds active ingredient per acre.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Apply a maximum of one application per year.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Grapes</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Maximum application rate per crop cycle: 4 pounds active ingredient per acre.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Apply a maximum of one application per year.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Kiwi Fruit</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Maximum application rate per crop cycle: 4 pounds active ingredient per acre.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Apply a maximum of one application per year.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Persimmons</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Maximum application rate per crop cycle: 4 pounds active ingredient per acre.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Apply a maximum of one application per year”</td>
<td></td>
</tr>
</tbody>
</table>
### Table 11: Summary of Labeling Changes for Napropamide

<table>
<thead>
<tr>
<th>Description</th>
<th>Amended Labeling Language</th>
<th>Placement on Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>End Use Products Intended Primarily for Use by Homeowners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Restrictions</td>
<td>“Do not apply this product in a way that will contact any person, pet, either directly or through drift. Keep people and pets out of the area during application.”</td>
<td>Directions for Use under General Precautions and Restrictions</td>
</tr>
<tr>
<td>Entry Restriction</td>
<td><strong>Liquid:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Do not allow people or pets to enter the treated area until sprays have dried.”</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Dry:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Do not allow people or pets to enter the treated area until dusts have settled. [If watering-in is required after the application, do not enter or allow others to enter the treated areas (except those involved in the watering) until the watering-in is complete and the surface is dry.]”</td>
<td></td>
</tr>
<tr>
<td>Application Equipment Restrictions</td>
<td>For turf, the maximum application rate per application: 2 pounds active ingredient per acre. Can only apply a maximum of one application per year.</td>
<td>Directions for Use under General Precautions and Restrictions</td>
</tr>
</tbody>
</table>

Instructions in the Labeling section appearing in quotations represent the exact language that should appear on the label.

Instructions in the Labeling section not in quotes represents actions that the registrant should take to amend their labels or product registrations.

1 PPE that is established on the basis of Acute Toxicity of the end-use product must be compared to the active ingredient PPE in this document. The more protective PPE must be placed in the product labeling. For guidance on which PPE is considered more protective, see PR Notice 93-7.
2 If the product contains oil or bears instructions that will allow application with an oil-containing material, the “N” designation must be dropped. [This footnote is not needed if a respirator is not required]

* Text “Wash the outside of gloves before removing” in User Safety Recommendations may not be needed if gloves are not required.
### Appendix A: Use Patterns Eligible for Reregistration

<table>
<thead>
<tr>
<th>Application Type, Equipment</th>
<th>Formulation</th>
<th>Max. Single App. Rate (lbs ai/A)</th>
<th>Seasonal Max (lbs ai/A/Yr)</th>
<th>PHI (days)</th>
<th>REI (Hours)</th>
<th>Restrictions/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Almond</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemigation, Band Treatment, Irrigation Incorporation, Directed Spray</td>
<td>50% DF [70506-36 ]</td>
<td>4</td>
<td>4</td>
<td>35</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td><strong>Asparagus</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemigation, Band Treatment, Soil Incorporation, Directed Spray</td>
<td>50% DF [70506-36 ]</td>
<td>2</td>
<td>2</td>
<td>35</td>
<td>12</td>
<td>Two applications are allowed per year for asparagus.</td>
</tr>
<tr>
<td><strong>Basil</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Band Treatment, Broadcast, Chemigation Soil Incorporation</td>
<td>50% DF</td>
<td>4</td>
<td>4</td>
<td>12</td>
<td></td>
<td>There is currently no registered uses of napropamide on basil. The registrant (United Phosphorus Inc.) has indicated that they will propose the inclusion of basil on the product label for the 50% DF formulation (70506-36).</td>
</tr>
<tr>
<td><strong>Blackberry</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemigation, Band Treatment, Irrigation Incorporation, Directed Spray</td>
<td>50% DF [70506-36 ]</td>
<td>4</td>
<td>4</td>
<td>90</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td><strong>Blueberry</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Application Type, Equipment</td>
<td>Formulation</td>
<td>Max. Single App. Rate (lbs ai/A)</td>
<td>Seasonal Max (lbs ai/A/Yr)</td>
<td>PHI (days)</td>
<td>REI (Hours)</td>
<td>Restrictions/Comments</td>
</tr>
<tr>
<td>-----------------------------</td>
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<td>----------------------</td>
</tr>
<tr>
<td>Chemigation, Band Treatment, Irrigation Incorporation, Directed Spray</td>
<td>50% DF [70506-36]</td>
<td>4</td>
<td>4</td>
<td>90</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td><strong>Boysenberry</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemigation, Band Treatment, Irrigation Incorporation, Directed Spray</td>
<td>50% DF [70506-36]</td>
<td>4</td>
<td>4</td>
<td>90</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td><strong>Broccoli</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemigation, Band Treatment, Soil Incorporation, Directed Spray</td>
<td>50% DF [70506-36]</td>
<td>2</td>
<td>2</td>
<td>90</td>
<td>12</td>
<td>Two applications are allowed per year for broccoli.</td>
</tr>
<tr>
<td><strong>Brussels sprouts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemigation, Band Treatment, Soil Incorporation, Directed Spray</td>
<td>50% DF [70506-36]</td>
<td>2</td>
<td>2</td>
<td>90</td>
<td>12</td>
<td>Two applications are allowed per year for Brussels Sprouts.</td>
</tr>
<tr>
<td><strong>Cabbage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemigation, Band Treatment, Soil Incorporation, Directed Spray</td>
<td>50% DF [70506-36]</td>
<td>2</td>
<td>2</td>
<td>90</td>
<td>12</td>
<td>Two applications are allowed per year for cabbage.</td>
</tr>
<tr>
<td><strong>Cauliflower</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Type, Equipment</td>
<td>Formulation</td>
<td>Max. Single App. Rate (lbs ai/A)</td>
<td>Seasonal Max (lbs ai/A/Yr)</td>
<td>PHI (days)</td>
<td>REI (Hours)</td>
<td>Restrictions/Comments</td>
</tr>
<tr>
<td>-----------------------------</td>
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<td>-----------------------------</td>
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<td>-------------</td>
<td>------------------------</td>
</tr>
<tr>
<td><strong>Chemigation, Band Treatment, Soil Incorporation, Directed Spray</strong></td>
<td>50% DF [70506-36 ]</td>
<td>2</td>
<td>2</td>
<td>90</td>
<td>12</td>
<td>Two applications are allowed per year for cauliflower.</td>
</tr>
<tr>
<td><strong>Cranberry</strong></td>
<td><strong>Aerial, Ground Spray</strong></td>
<td><strong>10% G [70506-34 ]</strong></td>
<td><strong>9</strong></td>
<td><strong>9</strong></td>
<td><strong>90</strong></td>
<td><strong>12</strong></td>
</tr>
<tr>
<td><strong>Eggplant</strong></td>
<td><strong>Chemigation, Band Treatment, Irrigation Incorporation, Directed Spray</strong></td>
<td><strong>50% DF [70506-36 ]</strong></td>
<td><strong>2</strong></td>
<td><strong>2</strong></td>
<td><strong>90</strong></td>
<td><strong>12</strong></td>
</tr>
<tr>
<td><strong>Filbert</strong></td>
<td><strong>Broadcast, Chemigation</strong></td>
<td><strong>50%</strong></td>
<td><strong>4</strong></td>
<td><strong>4</strong></td>
<td><strong>35</strong></td>
<td><strong>12</strong></td>
</tr>
<tr>
<td><strong>Grape</strong></td>
<td><strong>Chemigation, Band Treatment, Irrigation Incorporation, Directed Spray</strong></td>
<td><strong>50% DF [70506-36 ]</strong></td>
<td><strong>4</strong></td>
<td><strong>4</strong></td>
<td><strong>35</strong></td>
<td><strong>12</strong></td>
</tr>
<tr>
<td><strong>Kiwi Fruit</strong></td>
<td><strong>Chemigation, Band Treatment, Irrigation Incorporation, Directed Spray</strong></td>
<td><strong>50% DF [70506-36 ]</strong></td>
<td><strong>4</strong></td>
<td><strong>4</strong></td>
<td><strong>35</strong></td>
<td><strong>12</strong></td>
</tr>
<tr>
<td><strong>Loganberry</strong></td>
<td><strong>Empty</strong></td>
<td><strong>Empty</strong></td>
<td><strong>Empty</strong></td>
<td><strong>Empty</strong></td>
<td><strong>Empty</strong></td>
<td><strong>Empty</strong></td>
</tr>
<tr>
<td>Application Type, Equipment</td>
<td>Formulation</td>
<td>Max. Single App. Rate (lbs ai/A)</td>
<td>Seasonal Max (lbs ai/A/Yr)</td>
<td>PHI (days)</td>
<td>REI (Hours)</td>
<td>Restrictions/Comments</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------</td>
<td>---------------------------------</td>
<td>-----------------------------</td>
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<td>-------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Chemigation, Band Treatment, Irrigation Incorporation, Directed Spray</td>
<td>50% DF [70506-36]</td>
<td>4</td>
<td>4</td>
<td>90</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Majoram</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Band Treatment, Broadcast, Chemigation Soil Incorporation</td>
<td>50% DF</td>
<td>4</td>
<td>4</td>
<td>90</td>
<td>12</td>
<td>There is currently no registered uses of napropamide on marjoram. The registrant (United Phosphorus Inc.) has indicated that they will propose the inclusion of marjoram on the product label for the 50% DF formulation (70506-36).</td>
</tr>
<tr>
<td>Ornamentals (Trees-field &amp; Container, Herbaceous Plants, Woody Shrubs, Vines)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Band Treatment, Directed Spray, Ground Spray</td>
<td>50% DF [70506-38]</td>
<td>6</td>
<td>6</td>
<td>N/A</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Pecan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Max. Single App. Rate (lbs ai/A)</td>
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<td>REI (Hours)</td>
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<td>There is currently no registered uses of napropamide on rosemary. The registrant (United Phosphorus Inc.) has indicated that they will propose the inclusion of rosemary on the product label for the 50% DF formulation (70506-36).</td>
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<td>There is currently no registered uses of napropamide on savory. The registrant (United Phosphorus Inc.) has indicated that they will propose the inclusion of savory on the product label for the 50% DF formulation (70506-36).</td>
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## APPENDIX B

Data Supporting Guideline Requirements for the Reregistration of Napropamide

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## Data Supporting Guideline Requirements for the Reregistration of Napropamide

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### TOXICOLOGY

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## Data Supporting Guideline Requirements for the Reregistration of Napropamide

### OCCUPATIONAL/RESIDENTIAL EXPOSURE

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#### ENVIRONMENTAL FATE

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<td>Estimation of Dermal Exposure, Indoor Sites</td>
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<td>Estimation of Inhalation Exposure, Indoor Sites</td>
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### RESIDUE CHEMISTRY

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### Data Supporting Guideline Requirements for the Reregistration of Napropamide

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Appendix C. TECHNICAL SUPPORT DOCUMENTS

Additional documentation in support of this RED is maintained in the OPP docket, located in Room 119, Crystal Mall #2, 1921 Jefferson Davis Highway, Arlington, VA. It is open Monday through Friday, excluding legal holidays, from 8:30 am to 4 pm.

The docket initially contained preliminary risk assessments and related documents as of August 10, 1998. Sixty days later the first public comment period closed. The EPA then considered comments, revised the risk assessment, and added the formal “Response to Comments” document and the revised risk assessment to the docket on June 16, 1999.

All documents, in hard copy form, may be viewed in the OPP docket room or downloaded or viewed via the Internet at the following site:

www.epa.gov/pesticides/op

These documents include:

HED Documents:

- Napropamide: REVISED HED Chapter of the Reregistration Eligibility Decision Document (RED). 2/23/05 Stanton, Susan

- Napropamide. Chronic Dietary Exposure Assessments for the Reregistration Eligibility Decision. 10/29/04. Stanton, Susan

- Napropamide: Revised Occupational and Residential Exposure Assessment and Recommendations for the Reregistration Eligibility Decision Document. 2/20/05. Tadayon, Nadar
• Revised Product Chemistry Considerations. 2/15/05. Drew, Danette

• Napropamide. Revised Residue Chemistry Considerations for Reregistration Eligibility Decision. 2/18/05. Drew, Danette

• Review of Napropamide Incident Reports. 11/4/04. Blondell, Jerome

• Outcome of the 3/16/93 Meeting of HED Metabolism Committee. 4/7/93. Knizner, Steven

• Napropamide: Final HED Chapter of the Reregistration Eligibility Decision (RED) Document. 7/7/05. Stanton, Susan

**EFED Documents:**

1. EFED Risk Assessment for Napropamide Registration Eligibility Document. 3/1/05. Breithaupt, James & Jenkins, Fred

2. Drinking Water Assessment for Napropamide for Terrestrial Uses. 8/17/04. Breithaupt, James

3. Drinking Water Assessment for Napropamide. 11/12/04. Breithaupt, James

4. Guidance for selecting Input parameters in Modeling the Environmental Fate & Transport of Pesticides. 2/28/02. US EPA (Office of Pesticide Programs (OPP) Environmental Fate and Effects Division.

5. EFED Risk Assessment for the Napropamide Reregistration Eligibility Document. 8/15/05. Borges, Shannon & Breithaupt, James.

6. EFED Response to “Error Only” and Public Comments for the Napropamide RED. 8/16/05. Breithaupt, James

7. EFED RED Chapter for Napropamide Chronic Risk Recalculations for Mammals. 9/22/05. Randall, Donna
Appendix D. Citations Considered to Be Part of the Data Base Supporting the Rereregistration Decision (Bibliography)

Bibliography

61-1 Chemical Identity

MRID

40137 Stauffer Chemical Company (19??) Formula Dislosure (Percent Weight): Waylay 50-WP. (Unpublished study received Aug 20, 1971 under 2F1194; CDL:095554-D)


61-2 Description of Beginning Materials and Manufacturing Process

61-3 Discussion of Formation of Impurities

MRID

62-1 Preliminary Analysis

MRID


62-2 Certification of limits

62-3 Analytical Method

MRID


Americas, Inc. 12 p.


63-0 Reports of Multiple phys/chem Characteristics

MRID


39764 Stauffer Chemical Company (1972?) Devrinol(R): Summary of Environmental Studies. Summary of studies 093519-C through 093519- M. (Unpublished study received Dec 14, 1972 under 2F1194; CDL:093519-A)


57801 Stauffer Chemical Company (1972) Devrinol(R): Physical and Chemical Properties. (Unpublished study received May 27, 1977 under 476-2174; CDL:230294-A)

67870 Stauffer Chemical Company (1980) Tillam Dyfonate Devrinol Tank-mix Compatibility. (Unpublished study received Jan 26, 1981 under 476-1615; CDL:244253-B)


Stauffer Chemical Company (1971) Devrinol: Physical and Chemical Properties. (Unpublished study received Apr 27, 1981 under 0F2319; CDL:070040-C)


Stauffer Chemical Company (1974) Tank-mix Compatibility--Devrinol 50W and Simazine 80W; Devrinol 50W and 2E with Paraquat 2L and Simazine 80W. (Compilation; unpublished study received Dec 17, 1974; CDL:101111-D)


MRID

63-3 Physical State


63-6 Boiling Point


63-7 Density


63-9 Vapor Pressure


63-10 Dissociation Constant


63-12 pH


63-14 Oxidizing/Reducing Action


63-15 Flammability
63-16 Explodability

63-17 Storage stability

63-18 Viscosity

63-19 Miscibility

63-20 Corrosion characteristics
63-21 Dielectric breakdown voltage

71-1 Avian Single Dose Oral Toxicity

71-2 Avian Dietary Toxicity


113819 Joiner, R. (1975) Safety Evaluation of Devrinol Technical by a Five-day Feeding Study in Mallard Ducks: T-5469. (Unpublished study received Apr 25, 1979 under 476-2175; submitted by Stauffer Chemical Co., Richmond, CA; CDL:238234-A)


71-4 Avian Reproduction

MRID


72-1 Acute Toxicity to Freshwater Fish

MRID


118002 Sleight, B. (1972) Acute Toxicity of Devrinol to Bluegill Trout ...: ?Submitter| T-2223. (Unpublished study received Nov 9, 1982 under 476-2218; prepared by Bionomics, Inc., submitted by Stauffer Chemical Co., Richmond, CA; CDL:248806-C)


72-2 Acute Toxicity to Freshwater Invertebrates

MRID


72-3 Acute Toxicity to Estuarine/Marine Organisms

MRID

65360 Heitmuller, T. (1976) Acute Toxicity of Devrinol to Embryos of Eastern Oysters (~Crassostrea virginica~), to Pink Shrimp (~Penaeus duorarum~), and to Fiddler Crabs (~Uca pugila~). (Unpublished study received Mar 28, 1977 under 476-2184; prepared by EG&G, Bionomics, submitted by Stauffer Chemical Co., Richmond, Calif.; CDL:229228-C)


72-4 Fish Early Life Stage/Aquatic Invertebrate Life Cycle Study

MRID


81-1 Acute oral toxicity in rats

MRID


35672 Stauffer Chemical Company (19??) Devrinol 4-F Selective Herbicide. Summary of studies 242620-Q through 242620-S and 242620-X. (Unpublished study received Jun 9, 1980 under 476-2199; CDL: 242620-N)


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**81-2 Acute dermal toxicity in rabbits or rats**


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<td>35672</td>
<td>Stauffer Chemical Company (19??) Devrinol 4-F Selective Herbicide. Summary of studies 242620-Q through 242620-S and 242620-X. (Unpublished study received Jun 9, 1980 under 476-2199; CDL: 242620-N)</td>
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**81-3 Acute inhalation toxicity in rats**
81-4 Primary eye irritation in rabbits

MRID


35672 Stauffer Chemical Company (19??) Devrinol 4-F Selective Herbicide. Summary of studies 242620-Q through 242620-S and 242620-X. (Unpublished study received Jun 9, 1980 under 476-2199; CDL: 242620-N)


67521 Scholler, J. (1970?) Devrinol 10G Acute Toxicity Evaluation: Toxicity Laboratory Report T-
81-5 Primary dermal irritation

MRID

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81-6 Dermal sensitization

MRID


82-1 Subchronic Oral Toxicity: 90-Day Study

MRID


**82-2 21-day dermal-rabbit/rat**

**MRID**


**83-1 Chronic Toxicity**

**MRID**


112720  Stauffer Chemical Co. (1978) Two Year Feeding Study in Rats: Devrinol Technical: Raw Data: Project No. 132-137. (Compila- tion; unpublished study received Apr 6, 1981 under 9E2244; CDL:099978-B)

83-2 Oncogenicity

MRID


83-3 Teratogenicity -- 2 Species

MRID


### 83-4 2-generation repro.-rat

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### 83-5 Dietary: Combined Chronic Toxicity/Oncogenicity Studies

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### 84-2 Interaction with Gonadal DNA

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<td>25880</td>
<td>Shirasu, Y.; Moriya, M.; Simmon, V.F.; et al. (1976) Mutagenicity Testing on Napropamide in Microbial Systems. (Unpublished study including submitting company summary, received Jan 29, 1980 under 476-2108; prepared by Institute of Environmental Toxicology, Toxicology Div. in cooperation with Stanford Research Institute, submitted by Stauffer Chemical Co., Richmond, Calif.; CDL: 099218-B)</td>
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85-1 General metabolism

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MRID

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122-1 Seed Germination/Seedline Emergence and Vegetable Vigor

MRID  
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133-3 Dermal passive dosimetry expo

MRID  
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**133-4 Inhal. passive dosimetry expo**

**MRID**


**161-1 Hydrolysis**

**MRID**


**161-2 Photodegradation-water**

**MRID**


**161-3 Photodegradation-soil**

**MRID**


162-1 Aerobic soil metabolism

MRID


162-2 Anaerobic soil metabolism

MRID


162-3 Anaerobic aquatic metab.

MRID


162-4 Aerobic aquatic metab.

MRID


163-1 Leach/adsorp/desorption

MRID

164-1 Terrestrial field dissipation

MRID


164-2 Aquatic field dissipation

**MRID**


165-1 Confined rotational crop

**MRID**


165-4 Bioaccumulation in fish

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171-4B Residue Analytical Methods

MRID


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171-4C Magnitude of the Residue [by commodity]

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MRID


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113801 Stauffer Chemical Co. (19??) Evidence Regarding the Safety of the Pesticide Chemical Waylay. Summary of studies 091008-B through 091008-L. (Unpublished study received Jun 2, 1972 under 2F1194; CDL:091008-A)

113811 Murphy, J.; Didriksen, J.; Gray, R. (1970?) Metabolism of Radio- active ... (R-7465) in Plants and Animals. (Unpublished study received Jun 2, 1972 under 2F1194; submitted by Stauffer Chemical Co., Richmond, CA; CDL:091008-L)


132824 Stauffer Chemical Co. (1983) The Results of Tests on the Amount and Nature of the Residue, and Analytical Methodology for Devrinol. (Compilation; unpublished study received Dec 1, 1983 under 4F3005; CDL:072186-A)


171-4A3 Nature of the Residue in Livestock

MRID


830.1550 Product Identity and composition

MRID


830.1600 Description of materials used to produce the product

MRID


830.1620 Description of production process

MRID

46105001 Malte, A. (2003) Product Identity and Composition, Description of Materials Used to Produce the


830.1650 Description of formulation process

MRID


830.1670 Discussion of formation of impurities

MRID


830.1700 Preliminary analysis

MRID


830.1750 Certified limits
830.1800 Enforcement analytical method

830.6302 Color

830.6303 Physical state

830.6304 Odor
830.6314 Oxidizing or reducing action

MRID

830.6315 Flammability

MRID

830.6316 Explodability

MRID

830.6317 Storage stability of product

MRID

830.6319 Miscibility

MRID

830.6320 Corrosion characteristics

MRID

830.6321 Dielectric breakdown voltage

MRID
830.7000 pH of water solutions or suspensions

MRID

830.7200 Melting point/melting range

MRID

830.7300 Density/relative density

MRID

830.7550 Partition coefficient (n-octanol/water), shake flask method

MRID

830.7950 Vapor pressure

MRID

850.1010 Aquatic invertebrate acute toxicity, test, freshwater daphnids

MRID

870.1100 Acute oral toxicity

MRID
870.1200 Acute dermal toxicity

MRID

870.1300 Acute inhalation toxicity

MRID

870.2400 Acute eye irritation

MRID

870.2500 Acute dermal irritation

MRID

870.2600 Skin sensitization

MRID

Non-Guideline Study

MRID


2678 Phatak, S.C. (1973) Metribuzin Programs and Mixtures with Other Herbicides for Transplant Tomatoes: Report No. 42296. (Unpublished study received May 6, 1976 under 3125-277; prepared by Horticultural Experiment Station, Canada, submitted by Mobay Chemical Corp., Agricultural Chemicals, Kansas City, Mo.; CDL: 224187-BK)


2761 Stauffer Chemical Company (1975) Tillam 6-E/Paaran 6-E Tank-Mix Residue Data on Tobacco. (Unpublished study received Jul 19, 1976 under 476-1615; prepared in cooperation with Morse Laboratories, Inc.; CDL:225188-B)


IR-4 Project at Rutgers, the State University (1973) 1973 Herbicide Evaluation on Rabbiteye Blueberries. (Unpublished study received Dec 19, 1975 under 6E1719; CDL:095364-H)


**Foy, C.L.; Witt, H.L. (1971) Fruit: Evaluation of Herbicides for Weed Control in Bearing Peaches—One Year after Treatment.** (Unpublished study received Jan 18, 1973 under 100-437; prepared by Virginia Polytechnic Institute and State Univ., Dept. of Plant Pathology and Physiology, submitted by Ciba-Geigy Corp., Greensboro, N.C.; CDL:000242-AW)

**Daniell, J.W. (19??) Pecan herbicides. Pecan South ?:10-12.** (Also--in--unpublished submission received Jan 11, 1978 under 352-317; submitted by E.I. du Pont de Nemours & Co., Wilmington, Del.; CDL:096709-N)

**Aitken, J.B. (1973) Pecan Herbicides Evaluation.** (Unpublished study received Jan 11, 1978 under 352-317; prepared by Clemson Univ., Sandhill Experiment Station, submitted by E.I. du Pont de Nemours & Co., Wilmington, Del.; CDL:096709-Q)

**Aitken, J.B. (1975) Weed Control System in Young Pecan Trees.** (Incomplete study; unpublished study received Jan 11, 1978 under 352-317; prepared by Clemson Univ., Sandhill Experiment Station, submitted by E.I. du Pont de Nemours & Co., Wilmington, Del.; CDL:096709-S)

**Aitken, J.B. (1976) Herbicides in Pecans.** (Incomplete study; unpublished study received Jan 11, 1978 under 352-317; prepared by Clemson Univ., Sandhill Experiment Station, submitted by E.I. du Pont de Nemours & Co., Wilmington, Del.; CDL:096709-T)

**Fisher, B.B.; Sorensen, C., Jr. (1970) Peach Weed Control Trial.** (Unpublished study received Oct 17, 1973 under 352-374; prepared by Univ. of California, submitted by E.I. du Pont de Nemours & Co., Wilmington, Del.; CDL:026721-K)


**McFarlane, W. (1972) Almond Weed Control Trial: Al. Fr. 70-12.** (Unpublished study received Aug 1, 1974 under 5G1563; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-AO)

**Fischer, B.B. (1973) Annual Weed Control in Young Almonds.** (Unpublished study received Aug 1, 1974 under 5G1563; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-AP)

**Elmore, C.L.; Holmberg, D.M.; Roncoroni, E.J.; et al. (1972) Annual Weed Control in Almonds-2nd Year Evaluation.** (Unpublished study received Aug 1, 1974 under 5G1563; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-AR)

**Jensen, ? (1972) Efficacy of Various Herbicides on Almonds.** (Unpublished study received Aug 1, 1974 under 5G1563; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-AS)

**Foy, C.L.; Witt, H.L. (1972) Residual Herbicides (Winter Application) For Weed Control in Peaches—One Year after Treatment.** (Unpublished study received Jan 18, 1973 under 100-437; prepared by Virginia Polytechnic Institute and State Univ., Dept. of Plant Pathology and Physiology, submitted by Ciba-Geigy Corp., Greensboro, N.C.; CDL:000242-AW)
Bearing Apples--Gore, Virginia. (Unpublished study received Aug 1, 1974 under 5G1563; prepared by Virginia Polytechnic Institute and State Univ., Dept. of Plant Pathology and Physiology, submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-AT)

Foy, C.L.; Witt, H.L. (1972) Residual Herbicides (Spring Application) for Weed Control in Bearing Apples--Gore, Virginia. (Unpublished study received Aug 1, 1974 under 5G1563; prepared by Virginia Polytechnic Institute and State Univ., Dept. of Plant Pathology and Physiology, submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-AU)

Klosterboer, A. (19??) Field Screening of Herbicides in Texas Citrus. (Unpublished study including letter dated Jul 6, 1973 from C.D. Hobbs to C.E. Moore, received Aug 1, 1974 under 5G1563; prepared by Texas A & I Univ., Citrus Institute, submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-AX)

Eli Lilly and Company (1973) Peach Weed Control Trial. (Unpublished study received Aug 1, 1974 under 5G1563; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-AZ)

Fischer, B.B. (1973) Annual Weed Control in Peach Trees. (Unpublished study received Aug 1, 1974 under 5G1563; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-BF)

Eli Lilly and Company (1973) Peach Weed Control Trial Evaluation. (Unpublished study received Aug 1, 1974 under 5G1563; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-BF)

Foy, C.L.; Witt, H.L. (1972) Residual Herbicides (Winter Application) for Weed Control in Bearing Peaches--Gore, Virginia. (Unpublished study received Aug 1, 1974 under 5G1563; prepared by Virginia Polytechnic Institute and State Univ., Dept. of Plant Pathology and Physiology, submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-BF)

Elmore, C.L.; Morehead, G.W.; Roncoroni, E.J.; et al. (1973) Weed Control in Pears--2nd Year Evaluation. (Unpublished study received Aug 1, 1974 under 5G1563; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-BF)

Schweers, V.; Sibbett, S.; LaRue, J.; et al. (1972) Weed Control in Prunes, Plums and Nectarines. (Unpublished study received Aug 1, 1974 under 5G1563; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:094565-BF)


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Stauffer Chemical Company (1973) Peach Phytotoxicity. (Unpublished study received Dec 17, 1974 under 476-2150; CDL:028423-H)

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Stauffer Chemical Company (1973) Devrinol + Simazine Performance Summary. (Unpublished study received Dec 17, 1974 under 476-2150; CDL:028423-K)

kin, G.; Brendler, R.; Schweers, V.H.; et al. (1972) Devrinol--Transplanted Tomatoes--California: Tomato Phytotoxicity. (Unpublished study received Dec 17, 1974 under 476-2108; prepared in cooperation with C.&S. Ananian and Majarian Brothers, submitted by Stauffer
Owston, P.W.; Weatherly, H.G. (1979) Semi-operational Trials of Three Herbicides in Pacific Coast Forest Nurseries. (Unpublished study received Sep 18, 1979 under CO 79/26; prepared by U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station, Forestry Sciences Laboratory, submitted by Mobil Chemical Co., Richmond, Va.; CDL:241002-F)


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Chappell, ?.; Parochetti, J.V.; Watson, M.; et al. (1967) Summary Analysis of Field Test Data for Tillam 6E Applied Pre-transplant by Incorporation To Expand the Tobacco Registration from North Carolina to the Entire United States. (Unpublished study received Feb 5, 1968 under 8F0628; prepared in cooperation with Canada, Dept. of Agriculture, Experiment Farm, submitted by Stauffer Chemical Co., Richmond, Calif.; CDL:090823-A)
(Unpublished study received Sep 7, 1976 under 476-2150; prepared in cooperation with Univ. of Illinois and others, submitted by Stauffer Chemical Co., Richmond, Calif.; CDL:225549-A)

(Unpublished study received Sep 7, 1976 under 476-2150; submitted by Stauffer Chemical Co., Richmond, Calif.; CDL:225549-E)

27318 Stauffer Chemical Company (19??) Residue Chemistry: Summary of Volume Contents. Summary of studies 225547-A through 225547-J. (Unpublished study received Sep 7, 1976 under 476-2108; CDL: 225547-A)


30954 Maltby, R.; Skiles, R.; Duerksen, C.J.; et al. (1974) Efficacy of Devrinol and Other Herbicides on Ornamentals. (Unpublished study received Aug 5, 1975 under 476-2173; prepared in cooperation with Univ. of California--Davis and others, submitted by Stauffer Chemical Co., Richmond, Calif.; CDL:222820-A)


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Stauffer Chemical Company (1975) The Results of Tests on the Amount and Nature of the Residue, and Analytical Methodology: Dev- rinol®(R)I. (Unpublished study received on unknown date under 4F1447; CDL:093855-A)


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Stauffer Chemical Company (1973) ?Phytotoxicity: Devrinol|. (Unpublished study received Dec 17, 1974 under 476-2150; CDL: 028421-G)

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Stauffer Chemical Company (1979) ?Devrinol 4F: Crop Tolerance and Weed Control Summaries|. (Unpublished study received Jun 9, 1980 under 476-2199; CDL:242620-M)

Stauffer Chemical Company (1978) Acute Oral Toxicity--Rats: 14-Day Test Period. (Unpublished study received Jun 9, 1980 under 476-2199; CDL:242620-P)

Stauffer Chemical Company (1978) Acute Dermal Toxicity--Rabbits: 14-Day Test Period. (Unpublished study received Jun 9, 1980 under 476-2199; CDL:242620-Y)

Stauffer Chemical Company (1978) Primary Dermal Irritation--Rabbits: 72 Hour Test Period. (Unpublished study received Jun 9, 1980 under 476-2199; CDL:242620-Z)

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Rice, R.E.; Dibble, J.E.; Jones, R.A.; et al. (1974) Insecticides and timing sprays for control of
San Jose scale. California Agriculture 28(4):3. (Also—In—unpublished submission received Jun 26, 1974 under 100-501; submitted by Ciba-Geigy Corp., Greensboro, N.C.; CDL:094034-V)


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Stauffer Chemical Company (19??) Reasonable Grounds in Support of the Petition: ?Waylay|. (Unpublished study received Aug 20, 1971 under 2F1194; CDL:095554-F)


Stauffer Chemical Company (1971) Summary: ?Waylay|. Summary of studies 091006-B through 091006-N. (Unpublished study received May 5, 1972 under 2F1194; CDL:091006-A)


Stauffer Chemical Company (19??) Waylay®(TM)I Environmental Stud- ies. Summary of studies

Stauffer Chemical Company (1980) Efficacy of Herbicides in Weed Control on Apples and Other Crops. (Unpublished study received Dec 30, 1980 under 476-2202; CDL:244052-C)


Stauffer Chemical Company (1975) Devrinol: Herbicidal Efficacy Trials. (Compilation; unpublished study received Apr 27, 1977 under 476-2175; CDL:229651-A)


Stauffer Chemical Company (1976?) Summary of Toxicology Data. Summary of studies 229229-B and 229229-C. (Unpublished study received Mar 28, 1977 under 476-2184; CDL:229229-A)

Stauffer Chemical Company (1975) Summary of Performance Data. (Compilation; unpublished study received Mar 28, 1977 under 476-2184; CDL:229226-A)

Stauffer Chemical Company (1980) Summary of Residue Reports for Tillam 6-E(R)/Devrinol(R)I 4-F Tank Mix on Tobacco. (Compilation; unpublished study received Jan 26, 1981 under 476-1615; CDL:244253-F)

Stauffer Chemical Company (1980) Tillam(R)I 6-E/Dyfonate(R)I 4-E/ Devrinol(R)I (50-WP or 4-F) Tank Mix and Tillam(R)I 6-E/Dev- rinol(R)I 4-F Tank Mix: Field Performance Summary. (Unpublished study received Jan 26, 1981 under 476-1615; CDL:244253-J)

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Stauffer Chemical Company (1980) Efficacy of Devrinol on Trees and Vines. (Compilation; unpublished study received Dec 11, 1980 under 476-2108; CDL:243859-F)


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Stauffer Chemical Company (1976) ?Residue Data for Various Combinations of Tillam and Devrinol|. (Compilation; unpublished study received Jan 25, 1977 under 476-2182; CDL:227695-A)


Stauffer Chemical Company (1975) ?Efficacy Data for Crop Tolerance and Weed Control for Devrinol-tillam 1:4-E|. (Compilation; unpublished study received Jan 25, 1977 under 476-2182; CDL:227698-A)


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113805 Stauffer Chemical Co. (1969) "Toxicity of R-7465 to Rabbits": Toxicology Lab Report T-1389. (Compilation; unpublished study received Jun 2, 1972 under 2F1194; CDL:091008-E)

113812 Brookman, D.; Ja, B. (1973) Analysis of 50W and 2E Formulations of Devrinol: WRC 73-25. (Unpublished study received on unknown date under 4F1447; submitted by Stauffer Chemical Co., Richmond, CA; CDL:093858-A)

113813 Meyding, G. (1973) Letter sent to C. Smith dated Apr 3, 1973: Devrinol 50-WP. (Unpublished study received on unknown date under 4F1447; submitted by Stauffer Chemical Co., Richmond, CA; CDL:093858-B)

113816 Stauffer Chemical Co. (1975) "Study: Specific Herbicide Residues on Tobacco", (Compilation; unpublished study received on unknown date under unknown admin. no.; CDL:223372-A)


41435400 ICI Americas, Inc. (1990) Submission of Toxicological Data to Support the Amended Registration for Devrinol 50-DF Selective Herbicide. Transmittal of 1 study.

41462000 Rohm and Haas Co. (1990) Submission of data in support of registration of Pronamide: Confined rotation crop study. Trans- mittal of 1 study.

41575300 ICI Americas Inc. (1990) Submission of residue data to support the registration of Napropamide for agricultural use. Transmittal of 10 studies.


ICI Americas, Inc. (1990) Submission of toxicity data to support the registration of Napropamide. Transmittal of 1 study.


ICI Ag. Products (1992) Submission of toxicity data to support the registration of Devrinol 50 DF (Napropamide). Transmittal of 1 study.


42775800 Zeneca Ag Products (1993) Submission of residue (animal metabolism) data to support Phase 3 reregistration requirements for Napropamide. Transmittal of 2 studies.


43506700 Zeneca Ag Products (1994) Submission of Toxicity Data in Support of the Reregistration of Napropamide. Transmittal of 1 Study.

43514400 Zeneca Ag Products (1995) Submission of Environmental Fate Data in Support of Napropamide Reregistration. Transmittal of 1 Study.


43843400 Interregional Research Project No. 4 (1995) Submission of Residue Chemistry Data in Support of
the Petition for Tolerance for Napropamide on Oriental Radish. Transmittal of 1 Study.

43875000 Zeneca Ag Products (1995) Submission of Toxicity Data in Support of the Reregistration of Napropamide. Transmittal of 1 Study.


study prepared by Gharda Chemicals Ltd. 22 p.


46553300 United Phosphorus, Inc. (2005) Submission of Toxicity Data in Support of the FIFRA 6(a)(2) Data Requirements for Devrinol 2-EC Selective Herbicide and Devrinol 2-EC Ornamental Herbicide. Transmittal of 1 Study.


Appendix E. Generic Data Call-In
The Generic Data Call-In will be posted at a later date. See Chapter V of the napropamide RED for a list of studies.

Appendix F. Product Specific Data Call-In
A Product Specific Data-Call-In will be posted at a later date.

Appendix G.  EPA’s Batching of Napropamide products for meeting acute toxicity data requirements for reregistration.
In an effort to reduce the time, resources and number of animals needed to fulfill the acute toxicity data requirements for reregistration of products containing NAPROPAMIDE as the active ingredient, the Agency has batched products which can be considered similar for purposes of acute toxicity. Factors considered in the sorting process include each product's active and inert ingredients (identity, percent composition and biological activity), type of formulation (e.g., emulsifiable concentrate, aerosol, wettable powder, granular, etc.), and labeling (e.g., signal word, use classification, precautionary labeling, etc.). Note that the Agency is not describing batched products as "substantially similar" since some products within a batch may not be considered chemically similar or have identical use patterns.

Using available information, batching has been accomplished by the process described in the preceding paragraph. Notwithstanding the batching process, the Agency reserves the right to require, at any time, acute toxicity data for an individual product should the need arise.

Registrants of products within a batch may choose to cooperatively generate, submit or cite a single battery of six acute toxicological studies to represent all the products within that batch. It is the registrants' option to participate in the process with all other registrants, only some of the other registrants, or only their own products within a batch, or to generate all the required acute toxicological studies for each of their own products. If a registrant chooses to generate the data for a batch, he/she must use one of the products within the batch as the test material. If a registrant chooses to rely upon previously submitted acute toxicity data, he/she may do so provided that the data base is complete and valid by today's standards (see acceptance criteria attached), the formulation tested is considered by EPA to be similar for acute toxicity, and the formulation has not been significantly altered since submission and acceptance of the acute toxicity data. Regardless of whether new data is generated or existing data is referenced, registrants must clearly identify the test material by EPA Registration Number. If more than one confidential statement of formula (CSF) exists for a product, the registrant must indicate the formulation actually tested by identifying the corresponding CSF.

In deciding how to meet the product specific data requirements, registrants must follow the directions given in the Data Call-In Notice and its attachments appended to the RED. The DCI Notice contains two response forms which are to be completed and submitted to the Agency within 90 days of receipt. The first form, "Data Call-In Response," asks whether the registrant will meet the data requirements for each product. The second form, "Requirements Status and Registrant's Response," lists the product specific data required for each product, including the standard six acute toxicity tests. A registrant who wishes to participate in a batch must decide whether he/she will provide the data or depend on someone else to do so. If a registrant supplies the data to support a batch of products, he/she must select one of the following options: Developing Data (Option 1), Submitting an Existing Study (Option 4), Upgrading an Existing Study (Option 5) or Citing an Existing Study (Option 6). If a registrant depends on another's data, he/she must choose among:
Cost Sharing (Option 2), Offers to Cost Share (Option 3) or Citing an Existing Study (Option 6). If a registrant does not want to participate in a batch, the choices are Options 1, 4, 5 or 6. However, a registrant should know that choosing not to participate in a batch does not preclude other registrants in the batch from citing his/her studies and offering to cost share (Option 3) those studies.

Thirteen products were found which contain Napropamide as the active ingredient. These products have been placed five batches and a no batch group in accordance with the active and inert ingredients and type of formulation.

**Batching Instructions:**

No Batch: Each product in this Batch should generate their own data.

NOTE: The technical acute toxicity values included in this document are for informational purposes only. The data supporting these values may or may not meet the current acceptance criteria.

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**Appendix H. List of Registrants Sent this Data Call-In**

A list of registrants sent this data call-in will be posted at a later date.