MEMORANDUM:

SUBJECT: CYFLUTHRIN AND beta-CYFLUTHRIN INHALATION EXPOSURE ASSESSMENT

FROM: Bruce F. Kitchens, Chemist

TO: Karen Hammernick, Toxicologist
    Toxicology Branch I
    Health Effects Division 7509C

THRU: Mark I. Dow, Ph.D., Section Head
      Special Review and Registration Section II

      Larry C. Dorsey, Chief
      Occupational and Residential Exposure Branch
      Health Effects Division (7509C)

Please find below, the OREB review of:

DP Barcode: D196654

Pesticide Chemical Code: 128831

EPA Reg. No.: N/A

EPA MRID No.: N/A

Review Time: 3 days

PHED: YES: Version 1.01 Run # 14
I. INTRODUCTION:

A. Background:

Toxicology Branch I requests an inhalation exposure assessment be conducted on the active ingredients cyfluthrin and beta-cyfluthrin. The tox endpoint of concern is inhalation developmental toxicity with a maternal NOEL of 0.0011 mg/l and a developmental NOEL of 0.00059 mg/l. Cyfluthrin is a tox category II compound for acute inhalation toxicity.

Cyfluthrin is the active ingredient in the following formulations:

- Tempo®10WP insecticide (10% a.i.)
- Tempo®10WP insecticide in packets (10% a.i.)
- Tempo®1 insecticide (1 lb ai/gal)

Cyfluthrin is a synthetic pyrethroid used as an insecticide for broad spectrum control of crawling and flying insects. Use sites include but are not limited to buildings and structures and their immediate surroundings and on various modes of transport. The maximum application rates for Tempo® 10WP insecticide and Tempo® 10WP insecticide in packets is 19 g/1000 sq.ft under heavy pest pressure. The maximum application rate for Tempo® 1 insecticide is 16 ml/1000 sq.ft. under heavy pest pressure.

Each of the Tempo® formulations is applied with hand pressurized or power operated sprayers. Applications can be made to walls, floors, ceilings, in and around cupboards, between, behind, and beneath equipment, appliances, around floor drains, window and door frames, on the undersides of shelves, drawers and in similar areas. Applications may also be made to floor surfaces along walls and around air ducts, however, do not treat entire area of floor or floor covers.

B. Purpose:

This assessment estimates the mixer/loader/applicator inhalation exposure expected from the specified use of the previously mentioned Tempo® formulations.
II. DETAILED CONSIDERATIONS:

This exposure assessment is conducted on cyfluthrin since its chemical structure is similar to beta-cyfluthrin's chemical structure. The PHED exposure scenario used in calculating inhalation exposure consists of a low pressure hand wand treatment in which the mixer/loader and the applicator are the same individual. The Personal Protective Equipment (PPE) worn by the mixer/loader/applicator (M/L/A) are:

- long sleeved shirt
- long pants
- gloves

Of the three labels submitted to OREB, Tempo® 10WP insecticide and Tempo® 10WP insecticide in packets allow the most active ingredient to be dispensed by the M/L/A during a treatment period. Consequently, the calculations will be based on the wettable powder.

_Calculations:_

OREB uses the following assumptions to calculate inhalation exposure estimates.

_Table 1. Assumptions_

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Applications</td>
<td>1</td>
</tr>
<tr>
<td>M/L/A weighs</td>
<td>60 kg</td>
</tr>
<tr>
<td>Max application rate</td>
<td>19 g/1000 sq ft</td>
</tr>
<tr>
<td>PHED unit exposure</td>
<td>30 μg/lb ai handled</td>
</tr>
<tr>
<td>Area treated</td>
<td>400 ft² (20’ x 20’)</td>
</tr>
<tr>
<td>Application method</td>
<td>Hand wand low press</td>
</tr>
</tbody>
</table>

_Application Rate:_

\[
19 \text{ g/1000 ft}^2 \times 10\% \text{ a.i.} = 1.9 \text{ g ai/1000 ft}^2
\]

_Amount Handled per Treatment:_

\[
400 \text{ ft}^2 \times 1.9 \text{ g ai/1000 ft}^2 \times 1 \text{ lb/454 g} = 0.002 \text{ lb ai}
\]
Calculations: (con't)

Mixer/loader/applicator Inhalation Exposure is:

\[ 30 \text{ \mu g/lb ai} \times 0.002 \text{ lb ai} + 60 \text{ kg} = 1 \times 10^{-6} \text{ mg/kg/day} \]

III. CONCLUSIONS:

OREB concludes that the mixer/loader/applicator inhalation exposure resulting from the specified use of cyfluthrin is

\[ 1.0 \times 10^{-6} \text{ mg/kg/day} \]

cc: B. Kitchens
    John Redden (7509C)
    Chemical File: CYFLUTHRIN
    Circulation
    Correspondence