

The screening concentration in ground water (SCI-GROW) model is used to predict pesticide concentrations in shallow ground water. For a screening-level assessment for surface water EPA will use FIRST (a Tier I model) before using PRZM/EXAMS (a Tier II model). The FIRST model is a subset of the PRZM/EXAMS model that uses a specific high-end runoff scenario for pesticides. While both FIRST and PRZM/EXAMS incorporate an index reservoir environment, the PRZM/EXAMS model includes a percent crop area factor as an adjustment to account for the maximum percent crop coverage within a watershed or drainage basin.

None of these models include consideration of the impact processing (mixing, dilution, or treatment) of raw water for distribution as drinking water would likely have on the removal of pesticides from the source water. The primary use of these models by the Agency at this stage is to provide a coarse screen for sorting out pesticides for which it is highly unlikely that drinking water concentrations would ever exceed human health levels of concern.

Since the models used are considered to be screening tools in the risk assessment process, the Agency does not use estimated environmental concentrations (EECs) from these models to quantify drinking water exposure and risk as a %RfD or %PAD. Instead drinking water levels of comparison (DWLOCs) are calculated and used as a point of comparison against the model estimates of a pesticide's concentration in water. DWLOCs are theoretical upper limits on a pesticide's concentration in drinking water in light of total aggregate exposure to a pesticide in food, and from residential uses. Since DWLOCs address total aggregate exposure to clothianidin, they are further discussed in the aggregate risk sections.

Based on the FIRST and SCI-GROW models, the EECs of clothianidin for acute exposures are estimated to be 3.97 parts per billion (ppb) for surface water and 1.46 ppb for ground water. The EECs for chronic exposures are estimated to be 2.14 ppb for surface water and 1.46 ppb for ground water.

3. *From non-dietary exposure.* The term "residential exposure" is used in this document to refer to non-occupational, non-dietary exposure (e.g., for lawn and garden pest control, indoor pest control, termiticides, and flea and tick control on pets). Clothianidin is not registered for use on any sites that would result in residential exposure. Clothianidin is a major metabolite of the insecticide

thiamethoxam in plants and animals. Since there are also no residential uses of thiamethoxam, possible residential exposure to clothianidin due to thiamethoxam uses is not expected.

4. *Cumulative exposure to substances with a common mechanism of toxicity.* Section 408(b)(2)(D)(v) of the FFDCA requires that, when considering whether to establish, modify, or revoke a tolerance, 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."

EPA does not have, at this time, available data to determine whether clothianidin has a common mechanism of toxicity with other substances or how to include this pesticide in a cumulative risk assessment. Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, clothianidin does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore, EPA has not assumed that clothianidin has 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 final rule for Bifenthrin Pesticide Tolerances (62 FR 62961, November 26, 1997).

#### *D. Safety Factor for Infants and Children*

1. *In general.* Section 408 of the FFDCA provides that EPA shall apply an additional tenfold margin of safety for infants and children in the case of threshold effects to account for prenatal and postnatal toxicity and the completeness of the data base on toxicity and exposure unless EPA determines that a different margin of safety will be safe for infants and children. Margins of safety are incorporated into EPA risk assessments either directly through use of a MOE analysis or through using uncertainty (safety) factors in calculating a dose level that poses no appreciable risk to humans.

2. *Prenatal and postnatal sensitivity.* No quantitative or qualitative susceptibility was observed in either of the developmental rat or rabbit studies. Quantitative susceptibility was observed in both the reproduction and developmental neurotoxicity studies; however, the degree of concern for these studies is low because the observed effects are well characterized and there

are clear NOAELs/LOAELs in each case. In addition, the endpoint of concern is the one that is being used for short-, intermediate- and long-term dietary and non-dietary exposure risk assessments. There are no residual uncertainties. Therefore, there are no to low concerns with regard to prenatal and/or postnatal toxicity.

3. *Conclusion.* The toxicology database for clothianidin is not complete for FQPA purposes. A complete complement of acceptable developmental, reproduction, developmental neurotoxicity, mammalian neurotoxicity and special neurotoxicity studies are available; however, due to evidence of decreased absolute and adjusted organ weights of the thymus and spleen in multiple studies in the clothianidin data base, and since juvenile rats in the 2-generation reproduction study appear to be more susceptible to these effects, EPA has determined that testing should be conducted to assess immune system function in adults and in young animals following developmental exposures. As noted previously, a 10X database UF was applied because of the lack of this study.

The FQPA factor is removed because there are no to low concerns and no residual uncertainties with regard to prenatal and/or postnatal toxicity. As stated above, no quantitative or qualitative susceptibility was observed in either of the development rat or rabbit studies, and the observed effects are well characterized and there are clear NOAELs/LOAELs in the reproduction and developmental neurotoxicity studies. In addition, the acute and chronic dietary food exposure assessment utilizes existing and proposed tolerance level residues and 100% crop treated information for all commodities. By using these screening-level assessments, acute and chronic exposures/risks will not be underestimated. Furthermore, the dietary drinking water assessment (Tier I estimates) uses values generated by model and associated modeling parameters which are designed to provide conservative, health protective, high-end estimates of water concentrations. Finally, there are no residential uses for either clothianidin or thiamethoxam.

#### *E. Aggregate Risks and Determination of Safety*

To estimate total aggregate exposure to a pesticide from food, drinking water, and residential uses, the Agency calculates DWLOCs which are used as a point of comparison against the model estimates of a pesticide's concentration