Charge Questions for Proposed Approach for Developing Lead Dust Hazard Standards for Residences

Background

TSCA section 403 directs EPA to promulgate regulations that identify, for the purposes of Title X and Title IV of TSCA, dangerous levels of lead in paint, dust, and soil. EPA promulgated regulations pursuant to TSCA section 403 on January 5, 2001, and codified them at 40 CFR part 745, subpart D (USEPA, 2001a). These hazard standards identify dangerous levels of lead in paint, dust, and soil and provide benchmarks on which to base remedial actions taken to safeguard children and the public from the dangers of lead. Lead-based paint hazards in target housing and child-occupied facilities are defined in these standards as paint-lead, dust-lead, and soil-lead hazards. A paint-lead hazard is defined as any damaged or deteriorated lead-based paint, any chewable lead-based painted surface with evidence of teeth marks, or any lead-based paint on a friction surface if lead dust levels underneath the friction surface exceed the dust-lead hazard standards. A dust-lead hazard is surface dust that contains a mass-per-area concentration of lead equal to or exceeding 40 micrograms per square foot ($\mu g/ft^2$) on floors or 250 $\mu g/ft^2$ on interior window sills based on wipe samples. A soil-lead hazard is bare soil that contains total lead equal to or exceeding 400 parts per million (ppm) in a play area or average of 1,200 ppm of bare soil in the rest of the yard based on soil samples.

On August 10, 2009, EPA received a petition from several environmental and public health advocacy groups requesting that the EPA amend regulations issued under Title IV of TSCA (Sierra Club et al., 2009). Specifically, the petitioners requested that EPA lower the Agency's dust-lead hazard standards issued pursuant to section 403 of TSCA from 40 μg/ft2 to 10 μg/ft2 or less for floors and from 250 μg/ft2 to 100 μg/ft2 or less for window sills. On October 22, 2009, EPA granted this petition under section 553(e) of the Administrative Procedures Act, 5 U.S.C. 553(e) (USEPA, 2009a). In granting this petition, EPA agreed to commence the appropriate proceeding, but did not commit to a particular schedule or to a particular outcome.

The document entitled "Proposed Approach for Developing Lead Dust Hazard Standards for Residences" describes the methods that EPA proposes to examine the hazard standards for floors and window sills in residences.

Charge Question 1 - Draft Approach

OPPT has developed a draft Approach document for developing the hazard standards for floors and window sills in residences. This is intended to provide an overview of the approaches that will be used for the selection of the target blood lead levels, estimation of environmental media and exposure concentrations, and the blood lead modeling.

Question. Please comment on the reasonableness of the approach outlined in the draft Approach document.

Charge Question 2 - Conversion of Dust Loadings to Dust Concentrations

Section 3.3 and Appendix A of the Approach document describes the method for converting lead loadings to lead concentrations. Two methods are considered to convert from lead dust loading to lead dust concentration: a statistical regression model and a mechanistic mass-balance model. There are limited data available to develop an empirical relationship between lead dust loading and concentration for window sills and to parameterize the mechanistic model. In order to improve the approach, additional data would be needed or assumptions would have to be made which would introduce significant uncertainties to the results.

Question. Please comment on the proposed methods for converting dust loadings to dust concentrations. Please comment on whether the empirical or mechanistic model is preferred. Are there other methods that should be explored?

Charge Question 3 - Relation of Sill Dust to Floor Dust

Section 3.2 of the Approach document identifies a relationship that will be assumed between floor dust lead loadings and window sill dust lead loadings. This is further elaborated in section 6.1.5. Some such relationship is needed because not all studies measure lead loadings in both locations and the models that take lead exposures into blood lead require unitary indoor dust inputs. After a fashion similar to the regression model for converting lead loadings to lead concentrations, an empirical model was developed relating floor and window sill dust loadings.

Question. Please comment on the proposed method to relate floor dust loadings to window sill dust loadings. Please comment on the discussion of the regression's development. Please comment on how the assumptions regarding compliance with hazard standards are incorporated. Are there other methods that should be explored?

Charge Question 4 - Activity Patterns and Microenvironments

Section 3.4.1.2 of the Approach document describes how exposure profiles would be developed using data from the Consolidated Human Activity Database (CHAD) and algorithms from the Air Pollutants Exposure Model (APEX). Section 3.4.1.3 of the Approach document describes how the time spent by persons in various microenvironments would be used to define microenvironments of interest.

Question. Please comment on the proposed methods to establish the activity patterns and microenvironments for the blood lead modeling. Are there methods other than CHAD/APEX that should be explored?

Charge Question 5 - Blood Lead Modeling

The assessment will estimate blood lead levels for children. Section 4 of the document describes several models including the IEUBK model (EPA, 1994), the AALM model (EPA, 2005), the Leggett model (Leggett et al., 1993), the O'Flaherty model (O'Flaherty et al., 1993, 1995), and an empirical model (Lanphear et al., 1998b). For the purposes of developing the hazard standards for floor and window sills in residences based on blood lead levels in children, OPPT proposes to use the IEUBK model (EPA 1994).

Question. Please comment on the use of the IEUBK model. Please comment on whether other models should be used.