**HUMAN HEALTH RISK ASSESSMENT FOR EXPOSURE TO POLYCHLORINATED BIPHENYLS IN CONTAMINATED BUILDINGS**

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**ABSTRACT**  
This work provides additional evidence that PCBs are of concern for indoor air exposure. New observations for inhalation risks were derived from a building exposure assessment where PCBs were concentrated inside a large industrial building in the San Francisco Bay Area. Previous studies have shown that PCBs are ubiquitous in buildings, because of extensive use in the past, especially in transformers. Limited data are available regarding human exposure via ingestion. Indoor air PCBs were sampled in a building containing one of the largest transformers in the region. The results are discussed in comparison to other PCB contamination studies. Due to variation in isomer distribution patterns of PCBs, a toxicity equivalency factor (TEF) approach was used to estimate indoor air human risk. An additional focus was placed on the potential ingestion of PCBs from hand-to-mouth activities.

**METHODS**  
**Sampling and Speciation**  
Indoor air was sampled in Building A (Hillsborough County, Florida) over several exposure events using EPA Method 5020A. Sampled air was analyzed for 209 congeners using EPA Method 8010B (GC/MS). Aroclors were grouped into classes based on their heat stability and dielectric properties. The Technical Fate and Exposure Database (TFED) and literature were used to attribute potential sources of PCB contamination. Non-cancer and cancer risk assessment was performed for several PCB congeners based on their concentrations in indoor air. The results were compared to the USEPA’s revised risk screening level (RSL) and a background air concentration level of 60 ng/m³.

**Risk Assessment**  
The results were used to derive inhalation cancer risk estimates and non-cancer risk estimates. Inhalation risk assessment was performed using the USEPA’s Non-Cancer Ambient Air PRG (ng/m³). Risk assessment was conducted using the Form for the Health Risk Assessment of Polychlorinated Biphenyls (POLY-2). Risk assessment was also performed using the USEPA’s Risk Assessment Guidance for Off-site Contaminants (RAGS) Volume 1. Risk assessment was further revised using the USEPA’s Risk Assessment Guidance for Onsite Contaminants (RAGS) Volume 2. Risk assessment was also performed using the USEPA’s Risk Assessment Guidance for Onsite Contaminants (RAGS) Volume 3.

**EXPOSURE AND CONCLUSIONS**  
Indoor air risk evaluation may be needed when PCBs are present. Indoor air contamination can be managed by reducing exposure to PCBs in buildings. Risk assessment can be used to evaluate indoor air PCB contamination and provide guidance for risk management. PCBs are of concern for indoor air exposure. New observations for inhalation risks were derived from a building exposure assessment where PCBs were concentrated inside a large industrial building in the San Francisco Bay Area. Previous studies have shown that PCBs are ubiquitous in buildings, because of extensive use in the past, especially in transformers. Limited data are available regarding human exposure via ingestion. Indoor air PCBs were sampled in a building containing one of the largest transformers in the region. The results are discussed in comparison to other PCB contamination studies. Due to variation in isomer distribution patterns of PCBs, a toxicity equivalency factor (TEF) approach was used to estimate indoor air human risk. An additional focus was placed on the potential ingestion of PCBs from hand-to-mouth activities.

**REFERENCES**  