

Technical Review Workgroup (TRW) – Bioavailability Committee (BAC) 2023 Accomplishments

The TRW's Bioavailability Committee develops new guidance concerning human health risk assessment at hazardous waste sites. The Bioavailability Committee also provides site consultation in support of regional requests and identifies research needs to address data gaps relevant to contaminant bioavailability in soil site assessment activities.

Technical Support

One of the fundamental roles and responsibilities of the BAC is to provide technical support to state, federal, tribal, non-governmental and international groups regarding the assessment of relative bioavailability (RBA) and its application to human health risk assessment. Furthermore, the BAC promotes the application of best use of available scientific information concerning RBA and human health risk assessment methods in soil and soil-like (e.g., floodplains) media at affected sites.

The BAC members are technically diverse, experienced, and highly trained professionals in chemistry, toxicology, and human health risk assessment, and provide expert assistance in complex risk assessment scenarios.

The TRW Bioavailability Committee responded to requests for assistance in 2023 from two EPA regional offices and four from private consultants. Requests were for information on the following topics:

1. "Limits" of levels of arsenic in soil and adjustment of measure soil arsenic level for RBA;
2. Site-specific sampling plans for assessment of bioavailability of lead and arsenic in soil;
3. Methods for amending wetland soils for reducing lead bioavailability;
4. Soil lead RBA at site impacted by galena mining;
5. Application of EPA Method 1340 to soil amended with phosphate;
6. Application of soil bioavailability information in the EPA lead risk model Integrated Exposure Uptake Biokinetic Model for Lead in Children, Adult Lead Methodology;
7. Methods for measuring RBA of DDT in soil.

Methods and Tools Development

The BAC has developed the Bioavailability Sampling Planning and Evaluation Tool (BSPET) to support the 2021 Bioavailability Sampling Guidance (Guidance for Sample Collection for In Vitro Bioaccessibility Assay for Arsenic and Lead in Soil and Applications of Relative Bioavailability Data in Human Health Risk Assessment). The tool uses simulation techniques to predict false compliance and false exceedance decision error probabilities expected from user selected sampling plans. The tool can be used to identify sampling plans expected to meet sampling Data Quality Objectives (DQOs) and to evaluate results from to determine if DQOs were

achieved as recommended in the 2006 DQO Guidance (Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA/240/B-06/001).

The BAC is in the process of updating Method 1340 in the SW846 Test Methods Compendium. This update will formally add arsenic to the method, as well as provide updated concentrations for new standards.

The BAC continues to support development and refinement of the mouse RBA assays for arsenic and lead and research on soil amendments for permanently reducing arsenic and lead bioavailability.

Communication, Training, and Outreach

The BAC developed slide decks and videos for training on the 2021 Bioavailability Sampling Guidance to be presented in 2024 through a Clu-In webinar series.

The BAC has developed two fact sheets for the public that provide an overview of measurement and application of lead and arsenic relative bioavailability, respectively. Once approved and published, these fact sheets will help risk assessors, RPMs, OSCs, and community involvement coordinators discuss bioavailability of these contaminants.

The BAC also provided review and comment on bioavailability sections of the Residential Lead Sites Handbook and is developing a technical training on sampling, analysis, and application of bioavailability data for risk assessors.

Patents, Publications, and Presentations

Members of the BAC were awarded two patents on methods for sequestering ions in an environmental matrix. BAC members also published five papers in peer-reviewed journals and participated in eight presentations at national and international scientific meetings.

Technical Review Workgroup Bioavailability Committee Members:

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