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**Toxicity Assessments of Antimony, Barium, Beryllium, and Manganese for Development of Ecological Soil Screening Levels (ECO-SSL) Using Earthworm (*Eisenia Fetida*) Benchmark Values**

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**Abstract:** The U.S. Environmental Protection Agency (USEPA), in a collaborative effort with other Federal agencies, states, and private industry, is developing Ecological Soil Screening Levels (Eco-SSLs) for ecological risk assessment of contaminants at Superfund sites. Earthworm

(*Eisenia fetida*) cocoon production and survival tests were conducted in a Sassafra sandy loam soil that supports relatively high bioavailability of barium (Ba), beryllium (Be), manganese (Mn), and antimony (Sb). For the metals tested, cocoon production was a more sensitive endpoint than was survival. Bounded Lowest Observed Effect Concentrations (LOECs) (mg kg<sup>-1</sup>) for cocoon production, as determined by analysis of variance (ANOVA), were 83, 86, 433, and 1236 for Be, Sb, Ba, and Mn, as compared to LOECs for survival of 110, 697, 1585, and 2222, respectively. Bounded No Observed Effect Concentrations (NOECs) (mg kg<sup>-1</sup>) for cocoon production, as determined by ANOVA, were 57, 60,258, and 1111 for Be, Sb, Ba, and Mn, as compared to NOECs for survival of 83, 617,1348, and 1444, respectively. Non-linear regression analysis of cocoon production data showed that the relative toxicity (EC20 mg kg<sup>-1</sup>) of the four metals was in the order of Sb (30) = Be (52) > Ba (370) > Mn ( 629). These results will be submitted to the Eco-SSL Work ou for review and inclusion in their database.

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