Mercury Inhalation Risks from Use of Coal Combustion Products (CCPs) as Structural Fill and from Disposal of CCP-Containing Wallboard and Concrete in Landfills

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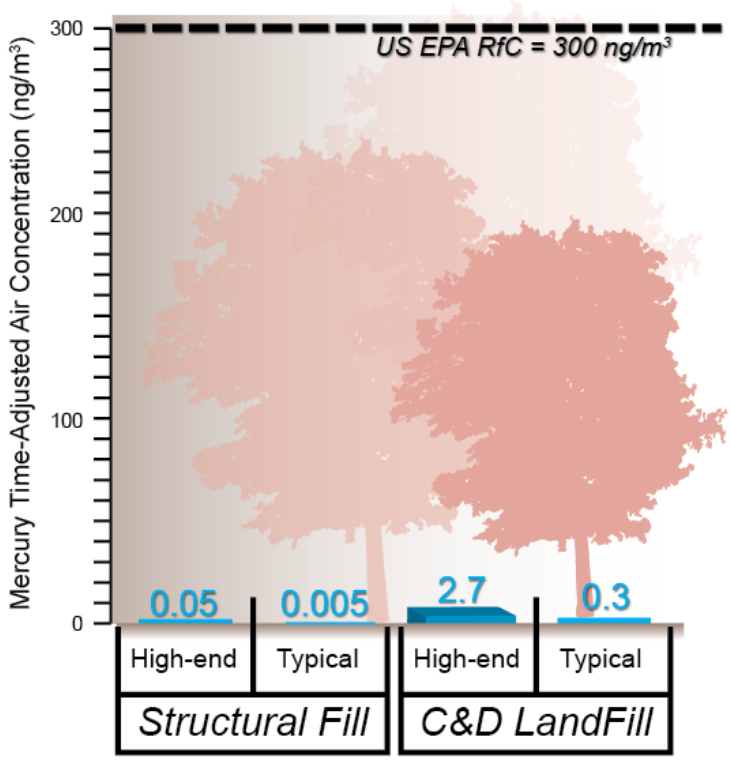
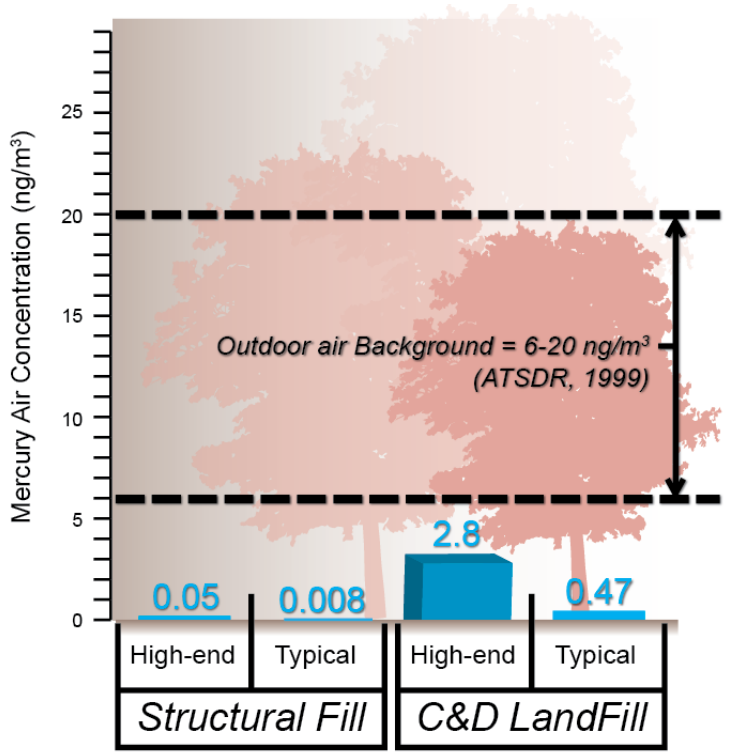
KEYWORDS: risk assessment, mercury, beneficial use, structural fill, landfill

The beneficial use of coal combustion products (CCPs) conserves natural resources, reduces landfill waste, and can improve the quality and performance of construction materials. Concerns remain, however, about potential exposures to mercury (Hg) in CCPs, including coal fly ash (CFA) used in concrete and structural fills, as well as flue gas desulfurization (FGD) materials used in wallboard. Moreover, with continued regulation of airborne Hg emissions, Hg concentrations in CCPs are likely to increase. Therefore, to examine potential exposures to Hg emissions from CCPs and any associated human health risks, we conducted a risk assessment to determine worst-case inhalation and more typical exposures to Hg for two outdoor exposure scenarios: (1) CFA used as structural fill material, and (2) CCP concrete and wallboard disposed of in a construction & demolition (C&D) landfill. For the structural fill scenario, we considered both fugitive dust emissions and volatilization of elemental Hg from the CFA. For the landfill scenario, we considered volatilization of elemental Hg from CCPs in concrete and wallboard. We estimated outdoor Hg air concentrations using the US Environmental Protection Agency's Wind Erosion SCREEN3 models, applying conservative, worst-case assumptions. To estimate potential risks to children and adults, we adjusted modeled outdoor air concentrations for exposure time, frequency and duration and compared to toxicity criteria. Our results showed that Hg exposures *via* inhalation from the CCP materials are near or below ambient Hg levels, and several orders of magnitude lower than health-based toxicity criteria. Thus, our findings indicate that upper-end exposures to Hg from the beneficial use of CCPs in structural fills, and from disposal of building materials containing CCPs, are not expected to pose an inhalation health risk. Key results are displayed graphically below.





This work was sponsored by the Electric Power Research Institute.

risk assessment, mercury, benefical use