UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OLEM Directive 9200.2-167

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OFFICE OF
SOLID WASTE AND
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OFFICE OF LAND AND
EMERGENCY MANAGEMENT

MEMORANDUM

SUBJECT: Updated Scientific Considerations for Lead in Soil Cleanups

FROM: Mathy Stanislaus
Assistant Administrator
Office of Land and Emergency Management

TO: EPA Regional Administrators, I-X

This memorandum highlights the current science and risk assessment tools that Regions may consider when implementing the 1994 *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities* (Office of Solid Waste and Emergency Response [OSWER] Directive 9355.4-12).

Childhood lead poisoning is a complex, multi-media problem that is most effectively addressed through the cooperative efforts of many programs at the federal, state, tribal, and local level. The overarching public health goal is to eliminate lead hazards before children are exposed by implementing primary prevention measures in homes and public facilities.

OSWER Directive 9355.4-12, issued on July 14, 1994, established the Office of Land and Emergency Management's (OLEM's) current approach for addressing lead in soil at Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) sites. OLEM's risk reduction goal in the directive is "...to limit exposure to soil lead levels such that a typical (or hypothetical) child or group of similarly exposed children would have an estimated risk of no more than 5% of exceeding a 10 µg/dL blood lead level." This goal was consistent with the CDC blood lead action level at the time of the directive's issuance.

OLEM programs use response authorities to assess and, where appropriate, to clean up lead contaminated soil and, if necessary, groundwater, that present unacceptable human health and/or ecological risk. As discussed in the *Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities* (OSWER Directive 9200.4-27P), issued in August 1998:

> Several sources of lead-contamination, including soil, ground water, airborne particulates, lead plumbing, interior dust, and interior and exterior lead-based paint may be present at Superfund

sites [and] may contribute to elevated blood-lead levels…However, there are limitations on the Agency's statutory authority under CERCLA to abate some of these sources...When EPA's resources, or authority to respond or to expend monies under Superfund is limited, OSWER recommends that EPA Regions identify and coordinate to the greatest extent possible with other authorities and funding sources (e.g., other federal agencies and state or local programs).

Since issuing the 1998 guidance, the EPA's experience has demonstrated that lead-contaminated soil responses are more effective when they employ a multi-pathway approach.

Based on the current scientific consensus and national public health recommendations regarding lead exposure, OLEM is highlighting the following recommendations for Regions to consider when implementing OLEM soil lead policy:

- Within the framework of existing policy, consider the current scientific conclusions[1] in conjunction with the Integrated Exposure Uptake and Biokinetic (IEUBK) model to determine soil screening levels for residential cleanups. Similarly, Regions should continue to use the most current version of the Adult Lead Methodology (ALM) to determine soil screening levels for commercial and industrial cleanups. Soil screening levels are used to determine if additional site-specific risk characterization is needed at sites where lead is detected in soil. Levels of lead above the screening level neither automatically require an action nor designate a site as "contaminated."
- Consistent with existing policy, soils screening levels are generally not used as default preliminary remediation goals (PRGs) and cleanup levels. Site-specific information is generally used to determine PRGs and cleanup levels. In particular, Regions should evaluate the site-specific bioavailability of lead using the EPA's *in-vitro* bioaccessibility assay for lead (see: https://www.epa.gov/hw-sw846/validated-test-method-1340-vitro-bioaccessibility-assay-lead-soil) when determining cleanup levels. Site-specific cleanup levels that are protective of human health may be higher or lower than the screening value depending on the bioavailability of lead. For example, Regions have observed site-specific relative bioavailability levels as low as 14% and as high as 88%, which can impact the soil screening level by as much as a factor of 6.
- On a site-specific basis, Regions may wish to vary some of the internal IEUBK model parameters (e.g., ingestion rate or mass soil to dust) based on peer-reviewed literature or site-specific studies. However, Regions shall consult with the Office of Superfund Remediation and Technology Innovation (OSRTI) and the Technical Review Workgroup for Lead before modifying these parameters.
- Continue to use Superfund removal authorities to address imminent risks associated with high levels of soil lead contamination. The current Removal Management Level (RML) for lead can be found on the RML website at https://www.epa.gov/risk/regional-removal-management-levels-chemicals-rmls

[1] The current scientific literature on lead toxicology and epidemiology provides evidence that adverse health effects are associated with blood lead levels (BLLs) less than 10 µg/dL. For example, EPA's Office of Research and Development reviewed the health effects evidence for lead in the 2013 Integrated Science Assessment for Lead (ISA for Lead) and found that several studies have observed "clear evidence of cognitive function decrements (as measured by Full Scale IQ, academic performance, and executive function) in young children (4 to 11 years old) with mean or group blood Pb levels between 2 and 8 µg/dL (measured at various lifestages and time periods)." In addition, the National Toxicology Program's (2012) Monograph on Health Effects of Low-Level Lead found sufficient evidence of delayed puberty, reduced post-natal growth, and decreased hearing for children at BLLs below 10 µg/dL and adverse effects on academic achievement, IQ, other cognitive measures, attention-related behaviors, and problem behaviors at BLLs below 5 µg/dL

- Consider the *Role of Background in the CERCLA Cleanup Program* (OSWER Directive 9285.6-07P). As discussed in that guidance, the RCRA Corrective Action and Superfund programs do not normally set cleanup levels below natural or anthropogenic background levels. Consideration of the EPA's background policy can be especially important in urban areas where contributions from sources other than the release being addressed under CERCLA or RCRA cleanup authorities (e.g., historic industry releases or lead gas emissions) may result in background levels much higher than the lead soil screening level.
- Work across programs to address multiple sources of lead at contaminated sites. Children in communities located near or on contaminated sites may be exposed to sources of lead that are not being addressed using CERCLA/RCRA cleanup authorities. As such, Regions should leverage their presence in communities to make a concerted effort to collaborate with federal, state, tribal and local partner agencies to communicate best practices to reduce exposure to lead.
- Prioritize resources for investigation and assessment of lead contamination at CERCLA and RCRA Corrective Action sites using a risk-based prioritization approach and in collaboration with state, local and federal public health agencies.

Regions should summarize the application of these recommendations, including the basis for the derived screening level, PRG, and final cleanup level, how site-specific bioavailability was considered, any variation of default parameters to the IEUBK model, and a description of how the region is prioritizing their resources to address sites with the highest risk, during a consultation with the OSRTI before finalizing any cleanup decision documents. OSRTI shall develop a compendium of application of these recommendations.

The EPA is undertaking a unified, cross-Agency approach to addressing lead. As part of that effort, OLEM is evaluating whether updated policy recommendations are needed to incorporate the current scientific consensus and national public health recommendations regarding lead exposure into land cleanup programs. Until that cross-Agency policy work is complete, OLEM's current policy, along with these recommendations, remain in effect.

If your staff have questions regarding these interim recommendations, please contact Michael Scozzafava (Chief, OSRTI Science Policy Branch) at (703) 603-8833.

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