

## **Consideration of Risk Perception as a Sustainable Remediation Best Practice: Case Study on Lead-Impacted Residences**

**Melissa A. Harclerode** (harclerodema@cdmsmith.com) (CDM Smith, Edison, NJ, USA and Montclair State University, Montclair, NJ, USA)  
Pankaj Lal (lalp@mail.montclair.edu) and Nareej Vedwan (vedwann@mail.montclair.edu)  
(Montclair State University, Montclair, NJ, USA)  
Bernabas Wolde (woldeb1@mail.montclair.edu) and Michael E. Miller  
(millerme@cdmsmith.com) (CDM Smith, Boston, MA, USA)

**Background/Objectives.** Stakeholder engagement is considered a sustainable remediation best management practice. Engagement of stakeholders is performed for various reasons throughout the remediation project life cycle, included during remedy implementation, control, and monitoring. A common reason for engaging community representatives during this process is to educate the public on identifying and preventing exposure to contamination they can be in direct contact with. Eradicating multiple sources of recalcitrant, non-point source pollutants within a large-scale residential setting can be technically and financially infeasible, thus resulting in public outreach playing a dominant role in risk management. Risk perception of community stakeholders has a direct influence on the success rate of public outreach. An individual's and community's perception to risk is directly influenced by site-specific physical, psychological, sociological, and demographical characteristics. Identification of these factors among the population can assist agencies implementing outreach activities to refine education material and modes of delivery to maximize benefits to the community and meet specific needs of the targeted public sector.

**Approach/Activities.** A risk perception survey was conducted of 244 community members in an urban setting in northern New Jersey. The case study area was chosen due to the presence of wide-spread sources of lead-based paint and historic fill material. Survey questions were developed to identify the following: (1) determine if residents are aware of lead contamination in soil and paint that may be present at their homes; (2) identify actions being taken by residents to address contamination issues; and (3) evaluate residents' perception of risk to lead contamination compared to other hazards, such as crime and flooding.

**Results/Lessons Learned.** The survey results indicate the community exhibits "optimism bias" and the majority of residents (approximately 80% of the respondents) do not identify themselves at high risk to susceptible and immediate hazards, including lead exposure, thus do not participate in prevention activities. In addition, these residents participate in behavior that may increase their exposure, such as interacting with surface soils. The results of the correlation analysis identified that residents exhibiting "optimism bias" are knowledgeable of adverse health effects to lead and perceive themselves as having the ability to address pollution. To overcome inaction, the analysis found a correlation between performance of lead testing with participation in prevention activities. In addition, the analysis identified vulnerable sub-populations who perceive their risk as low to lead impacted materials, including minorities, tenants, children under the age of 3, and Long-term residents, between 5 to 10 years. Therefore, we recommend providing interactive opportunities for stakeholders, especially vulnerable sub-populations, to participate in testing and mitigation activities, as well as encourage more landlord-tenant communication. In conclusion, education and outreach for remediation projects should be reevaluated to address heterogeneity of risk perception within the community and promote empowerment of residents to control risk.