

## Selected OLEM and OW Actions Informed by SHC Topic 3 Research

1. **Vapor intrusion-related actions: (1) Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (June 2015), (2) Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites (June 2015), and (3) Addition of the Subsurface Intrusion to the Hazard Ranking System, Final Rule (Fall 2016).**

SHC provided the following research, and technical support, to inform these actions:

- *Simple, Efficient, and Rapid Methods to Determine the Potential for Vapor Intrusion into the Home: Temporal Trends, Vapor Intrusion Forecasting, Sampling Strategies, and Contaminant Migration Routes*, EPA/600/R-15/070.
- *Assessment of Mitigation Systems on Vapor Intrusion: Temporal Trends, Attenuation Factors, and Contaminant Migration Routes under Mitigated and Non-Mitigated Conditions*, EPA/600/R-13/241 (June 2015)
- *Passive Samplers for Investigations of Air Quality: Method Description, Implementation, and Comparison to Alternative Sampling Methods*, EPA/600/R-14/434.
- *An Approach that Uses the Concentrations of Hydrocarbon Compounds in Soil Gas at the Source of Contamination to Evaluate the Potential for Intrusion of Petroleum Vapors into Buildings (PVI)*, EPA/600/R-14/318.
- *Ground Water Issue Paper: An Approach for Developing Site-Specific Lateral and Vertical Inclusion Zones within which Structures Should be Evaluated for Petroleum Vapor Intrusion due to Releases of Motor Fuel from Underground Storage Tanks*, EPA/600/R-13/047.
- *Fluctuation of Indoor Radon and VOC Concentrations Due to Seasonal Variations*, EPA/600/R-12/673.

While others are undergoing review or in progress, recently published journal articles include:

- “The Effect of Equilibration Time and Tubing Material on Soil Gas Measurements” *Soil and Sediment Contamination: An International Journal*, 25:2, 151-163 (2016).
- “Comparing Vapor Intrusion Mitigation System Performance for VOCs and Radon” *Remediation* 25 (4):7–26 (2015).

### 2. **Management Standards for Hazardous Waste Pharmaceuticals; Proposed Rulemaking (Sept. 2015)**

The following research supports OLEM’s rulemaking and its proposed conditional exemption for acute (P-listed) hazardous waste pharmaceutical residues in empty containers:

- *Evaluation of P-listed Pharmaceutical Residues in Empty Pharmaceutical Containers*, EPA/600/R-14/167.

### 3. **Guidelines for Evaluating the Post-Closure Care (PCC) Period for Hazardous Waste Disposal Facilities under Subtitle C of RCRA and forthcoming “Technical Guidance” (transmitted to OMB on Sept. 7<sup>th</sup>, with interagency comments due Sept. 27, 2016)**

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SHC is evaluating data from eight landfills that are nearing the end of their 30-year PCC period to quantify the field performance of engineered containment systems. Results will form the basis for *technical guidance* to evaluate HW landfills, with a final report projected for completion in late fall 2016.

### 4. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCRs) from Electric Utilities; Final Rule (published on April 17, 2015)

SHC is developing the *Leaching Environmental Assessment Framework (LEAF) Implementation Guidance* and supporting software (*i.e.*, *LeachXS-Lite*) for data management, analysis, and visualization. The following LEAF-related publications are cited in the *Federal Register* promulgating the CCRs final rule:

- *Leaching Test Relationships, Laboratory-to-Field Comparisons and Recommendations for Leaching Evaluation using the Leaching Environmental Assessment Framework (LEAF)*. EPA-600/R-14/061.
- *Interlaboratory Validation of the Leaching Environmental Assessment Framework (LEAF) Method 1314 and Method 1315*. EPA/600/R-12/624.
- *Interlaboratory Validation of the Leaching Environmental Assessment Framework (LEAF) Method 1313 and Method 1316*. EPA/600/R-12/623.
- "Evaluating the fate of metals in air pollution control residues from coal-fired power plants," *Environmental Science and Technology*, 44, 7351–7356.
- *Characterization of Coal Combustion Residues from Electric Utilities – Leaching and Characterization Data*. EPA-600/R-09/151.
- *Characterization of Coal Combustion Residues from Electric Utilities Using Wet Scrubbers for Multi-Pollutant Control*. EPA/600/R-08/077.
- *Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control*. EPA-600/R-06/008.

### 5. CCR Beneficial Use Evaluation: Fly Ash Concrete and FGD Gypsum Wallboard (February 2014) >> Next Generation Leaching Tests

The following analyses of fly ash used in production of cementitious materials provided data critical to OLEM's decision that the use of fly ash (and gypsum) for encapsulated uses is appropriate and meets EPA's definition of beneficial use:

- "Effect of Coal Combustion Fly Ash Use in Concrete on the Mass Transport Release Constituents of Potential Concern." *Chemosphere* 103 (2014) 131–139.
- "pH-dependent Leaching of Constituents of Potential Concern from Concrete Materials Containing Coal Combustion Fly Ash." *Chemosphere* 103 (2014) 140–147.

Current work entails developing next generation leaching tests for organics for help with beneficial use assessments and evaluation of disposal, treatment, and remediation technologies.

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- Workshop Report: Considerations for Developing Leaching Tests for Semi- and Non-Volatile Organic Compounds, EPA/600/R-16/057.

### **6. Science Integration into Ongoing OLEM and OW Actions**

SHC researchers work through ORD's Office of Science Policy (OSP) to provide research products and technical support for regulatory and non-regulatory actions developed by Program Offices (e.g., OLEM, OW).

- Office of Water's work on the Lead and Copper Rule regarding age-group specific aggregate exposure assessment to lead
  - OW's Office of Ground Water and Drinking Water (OGWDW) requested ORD technical assistance with exposure modeling to inform a health-based value for lead in drinking water, in response to National Drinking Water Advisory Council (NDWAC) recommendations regarding the revised Lead and Copper Rule. This underwent a peer consult in September 2016 and will be considered in OW's decision.