Vapor Intrusion Assessment at the Mound, Ohio, Site

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Mound Site Location
Background

- Mound operated from 1948-2003 as an integrated research, development, and production facility to support the nation’s energy and weapons programs
  - Employed 2,500 employees in 120 buildings on 306 acres
  - Stable isotope separation, fossil fuels research, tritium recovery, radioisotope thermoelectric generators

- Named to National Priority List (1989) due to volatile organic compound contamination in groundwater
  - Tripartite Federal Facility Agreement between DOE, the U.S. Environmental Protection Agency (EPA), and Ohio EPA
  - Record of Decision includes Institutional Controls and Pump & Treat remedy
Remediation and Reuse

- CERCLA cleanup completed in 2006
  - 14 million cubic feet of soil waste was removed and disposed of
  - Remediated to industrial/commercial reuse standards
- Additional cleanup conducted 2006–2010 with congressional and American Reinvestment and Recovery Act of 2009 funding
  - OU-1 landfill excavated
- Mound Development Corporation manages industrial/commercial reuse of the site as the Mound Business Park
Why Vapor Intrusion at Mound?

- Outcome of the fourth CERCLA Five-Year Review in 2016
  - Vapor intrusion was never evaluated in the Residual Risk Evaluation process as a potential exposure pathway for the Mound site
  - Vapor-forming chemicals present in the subsurface at the Mound site
  - Available information was not sufficient to evaluate whether all conditions of vapor intrusion were present under current or reasonably expected future conditions
  - **Recommendation**: conduct a vapor intrusion assessment to determine whether complete exposure pathways are present or could be present in the future
Vapor Intrusion Approach

- **Work Plan** *(completed)*
  - Phase 1: Preliminary Screening and Assessment Report *(in process)*
  - Phase 2: Vapor Source Characterization and Building Foundation Assessment
  - Phase 3: Near-Building and Indoor Air Quality Determination *(if required)*

- Final Summary Report
Phase 1: Preliminary Screening and Assessment Report

- Initial conceptual site model
  - Reviewed 134 documents from historical Mound record
  - Sources of contamination, remedial actions, use of most current data
  - Dominating geological features
  - Current and future land use
  - Traditional building designs
  - Building slope threshold of 20%

- Screening of historical soil, groundwater, and soil-gas data
Phase I: Preliminary Screening and Assessment Report

- Screening levels obtained from the vapor intrusion screening level (VISL) calculator
  - VISL calculator allows for inputs of site-specific data. Assumptions used for the Mound site:
    - Exposure scenario, commercial (present and future on-site land use)
    - Target risk for carcinogens = $1 \times 10^{-6}$
    - Target hazard quotient for noncarcinogens = 0.1
    - In situ groundwater temperature = 15 °C
Phase 1: Preliminary Screening and Assessment Report (continued)

- Preliminary screening results
  - Soil
    - Identified general areas of detections in soil
    - Historical data representing soils left in place were used
    - Retained any data with results above the detection limit
    - Main categories of contaminants:
      - Volatile organic compounds
      - Benzene, toluene, ethylbenzene, and xylenes
      - Polychlorinated biphenyls/polyaromatic hydrocarbons
      - Mercury
Phase 1: Preliminary Screening and Assessment Report (continued)
Phase 1: Preliminary Screening and Assessment Report (continued)

- Preliminary screening results (continued)
  - Groundwater
    - Focus on 2015–2016 data
    - Primary contaminants that exceeded VISL: trichloroethene (TCE) and vinyl chloride
  - Soil-gas
    - Primary contaminants that exceeded VISL: TCE and dichloroethene
Phase 1: Preliminary Screening and Assessment Report (continued)

- Preliminary screening results (continued)
  - Fifteen areas identified as potential vapor sources
  - Two areas (6 and 13) not retained
    - Ongoing groundwater remedy
    - Slopes >20%
  - Mercury eliminated from further investigation
    - Not attributable to Mound site
Path Forward

- Finalize Phase 1 Assessment Report
  - Regulator approval
- Develop Sampling and Analysis and Quality Assurance Plans
  - Regulator approval
- Communicate with property owners and lessees
  - Possible of perception that CERCLA cleanup was not completed
- Conduct Phase 2: Vapor Source Characterization and Building Foundation Assessment (anticipated spring 2019)
  - Soil-gas sampling at Phase I identified locations
  - Utilize data to update conceptual site model
- Determine if Phase 3 (sub-slab/indoor air) is necessary
- Final report and recommendations for addressing VI if necessary