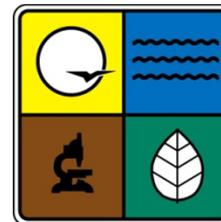


What we found and Where we found it!

Chris Cady

Scott Walker



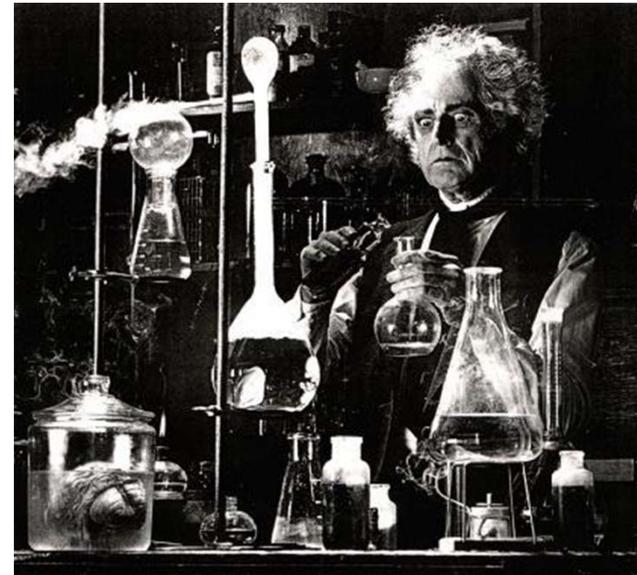
MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Part 1: Sites and Their Contaminants: What to Look For, What to Expect



Phase I Environmental Site Assessment (ESA)

- American Society for Testing and Materials (ASTM)
- Standard requirements for Phase I ESA
- Records and site history
- Recognized Environmental Conditions (RECs)



Phase II Environmental Site Assessment (ESA)

- RECs are investigated
- Soil and groundwater sampling
- Lead paint
- Asbestos
- Can lead to further sampling



Risk Assessment

- What is the intended future use for the site
- How “clean” does the site need to be
- Follow Missouri Risk-Based Corrective Action (MRBCA)

Remedial Action Plan (RAP)

- What remediation will be performed
- How it will be performed
- The more details,
the better
- Quality Assurance
Project Plan (QAPP)



Exposure Pathways

- Surficial soil
 - Top 3 feet
 - Ingestion, inhalation, and dermal contact
 - Leaching to ground water



Exposure Pathways

- Subsurface soil
 - Below 3 feet to ground water
 - Indoor inhalation
 - Leaching to ground water



Exposure Pathways

- Groundwater
 - Indoor inhalation of vapor emissions
 - Dermal contact
 - Domestic use (drinking)
 - Discharge to waterways (streams, lakes)



Typical contaminants

- Lead paint
- Asbestos
- Hazardous waste

Old buildings

- Lead paint
- Asbestos
- Hazardous waste
 - Ballasts
 - Mercury switches
 - Small containers of chemicals
- Transformers



Urban Fill

- Polynuclear Aromatic Hydrocarbons (PAHs)
- Coal Cinders or Coal Ash
- Lead
- Other stuff



Old Gas Stations

- *Regulated stations go through tanks unit for closure
- Tank may have already been removed but residual contamination could be encountered
- Surprise!



Commercial Facilities

- Anything is possible
- Always look for lead paint and asbestos
- Shopping centers and malls
- Hospitals – backup generator fuel tanks
- Stadiums and arenas – backup generator fuel tanks also

Commercial Facilities (cont.)

- Tire and auto repair – similar contaminants encountered at gas stations and also solvents
- Dry cleaners – chlorinated and petroleum based solvents, depending upon timeframe that the business operated
- Prisons
- Schools – heating oil tanks

Industrial Facilities

- Anything is possible
- The type of industry will be an indication of what to look for



Industrial Buildings (cont.)

- Chemical plants
- Auto industry
- Battery manufacturing
- Metal mining, smelting, machining, plating
 - Chat
 - Metal dust
 - Solvents
 - Lagoon sediments

Industrial Buildings (cont.)

- Landfills
 - Gas
 - Leachate
- Railroads
 - Cinder fill
 - Arsenic herbicide for weed control
 - Fueling
 - Maintenance



Industrial Buildings (cont.)

- Railroad facilities
 - Undocumented tanks
 - Trash/burn piles
 - Hazardous materials that were transported
 - Other chemicals of concern



Industrial Buildings (cont.)

- Military bases
 - Asbestos
 - Lead paint
 - Dumps
 - Fuel tanks
 - Transformers
 - Shooting ranges



Questions?