Addressing Mine-Scarred Land in the Upper Mississippi River Mining District

Geoffrey Siemering and Kyle Pepp
University of Wisconsin, Madison
Department of Soil Science

Production Totals

- 814,000 tons of lead
- 1,000,000 tons of zinc
- 40,000,000 tons of ore
Sick corn gets your attention!

Human and Ecological Impacts
Current
• Ignored
• ‘Low-Productivity’ Land
• Hauled ‘away’
• Spread in thinner layer over region

Preferred
• Clearly identified
• Site access controlled
• Eliminate off-site movement
• Remediation plans developed

Regulatory Concerns
• No innocent landowner provision in state ‘Spills’ law
• Contaminant levels above regulatory thresholds require listing on state Brownfield/Contaminated Lands registry
• Real estate law requires disclosure of known contaminants
• Farm succession plans beginning to require environmental review
• Strong regulatory incentive to not test for contaminants.
How can we help?

Several initiatives underway to assist local communities:
- Integration of mine map resources into current GIS based mapping systems
- Investigating soil amendments to immobilize lead and detoxify zinc
- Testing ‘low-engineering’ pollinator island alternative land use

Historic Mining Data Sources

USGS Professional Paper 309
Heyl et al. 1959

Wisconsin Geologic and Natural History Survey’s Mineral Development Atlas
- Data compilation effort began in 1945
- Gathered permitting information from mining companies
- Finished by WGNHS in 1976
- PLSS section maps of mine activity
- Aided by current data:
  - County land records
  - 2017 imagery
  - High resolution lidar-derived DEM

Upper Mississippi Valley Zinc and Lead District (Heyl 1959)
Regional Mining History

**1600-1850**
- Lead Surface Mining
  - Scattered small-scale operations prior to 1850
- Civil War munitions
- Surface lead contamination

**1850-1909**
- Underground Zinc Mining
  - Gravity Concentration (tailings at mine site)
- Roasting and magnetic refining (tailings along railway)

**1929-1979**
- Underground Zinc Mining (new technology)
  - Gravity Concentration (tailings at mine site)
- Flotation refining (isolated tailings slurry ponds)

Mapping Process

Digitize Layers from Mine Atlas:
- Boreholes
- Underground Mines
- Unsurveyed Underground Mines
- Open Pit Mines
- Mines Shafts
- Abandoned Railroads
- Lead Diggings Sites
- Acid Plants
- Missing Data Areas

Mine Development
Planning Applications

Add relevant layers:
- City Owned Parcels
- WDNR Impaired Waters
- Civil Divisions
- Highways and Roads
- Orthophotos
- LIDAR Hillshade

Problems

Soil Amendments

- Composted yard waste
- Fishbone meal + sulfur
- Triple super phosphate (TSP)
- Phosphoric acid
- Non-amended control.
Pollinator Islands

Would pollinator islands be successful in these areas?
- Put lands into conservation easements.
- Can pollinator plants be grown successfully in mine-scarred soil?
- Will the pollinator plants absorb Pb into their tissues?
- Can we develop a faster way to measure metal content in plant tissue?
Rural Communities Not Excluded!

V.3. Considerations and Other Factors

In making final selection recommendations from among the most highly ranked applicants on scales of the form described in Section V.C.  EPA’s Selection Officer may consider the following factors, if appropriate. In their proposals, applicants should provide a summary as to whether and how any of these factors apply:

- the proposed assessment project advances the applicable region’s regional priorities;
- the proposal is for an area defined to include urban and rural areas, including an eligible community (as defined by the EPA) or “marginal” communities (these communities with populations of 15,000 or less).
- the proposal is for a rural, African American, or Spanish speaking community, including “rural” communities, as defined by the EPA.
- the proposal is located within a cluster of only experimental, important pesticides, like 391, or more, of the population lives less than 50 years old over the past 50 years, as determined by the EPA and the population loss in density over the past 50 years, as determined by the EPA.
- the project is located within an EPA’s “Six Regions” and among the state and counties;
- compliance with the 75 percent statutory allocations for funding assistance;
- whether the project is for a federally recognized Indian tribe or United States territory or whether the territory to minimize a risk or to
- whether major environmental losses are impacted by non-urban land;
- whether the project primarily focuses on Phase II assessment;
- demonstrates from leveraging commitments for facilitating brownfield project completion, by identifying in the proposal the amounts and contributions of resources including documentation that has contributed to the project; and/or
- whether the applicant is a recipient of an EPA Brownfields Area-Wide Planning grant.

Rural Solar?

Summary

• Mine scarred lands in many states
• Local communities know of mining history, but not hazards this history still causes
• Agriculture industry and agencies may not be aware of historic mining hazards
• Institutional control and non-low engineered interventions can be used to protect public health
• EPA Brownfields funding a potential funding source
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Contact information:
Geoff Siemering  gsiemering@wisc.edu  608-262-9969
Kyle Pepp      kyle.j.pepp@wisc.edu