

Analysis of EPA Mandated Soil Amendments¹

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Abstract: Tar Creek was formally a part of the Tri-State mining district that encompassed Missouri, Kansas, and Oklahoma. Specifically, the Oklahoma portion of Tar Creek had extensive lead and zinc mining that caused contamination throughout the soil and water systems. While many efforts have been made to combat these negative implications, remediation is currently ongoing. At Tar Creek, the Environmental Protection Agency (EPA) has been implementing soil amendments to reduce concentrations of lead (Pb), zinc (Zn), and cadmium (Cd). As part of this study, we tested whether this mandated amendment has been effective as intended. In accordance with the EPA field sampling method, we conducted quarterly sampling for a year after amendments were implemented. Samples were analyzed in a lab to determine total levels of Pb, Zn, and Cd, in addition to organic matter, pH, phosphorus, potassium, and nitrogen. We then compared post-amendment heavy metal concentrations against pre-amendment concentrations. Preliminary analysis suggests that there was no apparent reduction in the amount of heavy metals in the soil following remediation, although we expect that further analysis should more effectively reveal trends in these contaminants. From the preliminary results, we hypothesize that such remediation may not be readily evaluated within the time frame implemented in this study. Therefore, future research should be conducted to determine the impact of soil amendments over time and if any specific component of the amendment and/or environment impacts the success of such remediation methods.

Additional Keywords: Tar Creek, Superfund Site, heavy metal mining, remediation, soil contamination

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