Abrasion and weathering of lead bullet in Florida shooting range soils. (S11-hardison112941-Oral)

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Abstract:

Lead contamination has been documented in the soils of shooting ranges. Past research on Pb contamination of shooting ranges has focused on weathering reactions of Pb bullets/pellets in soil. In the present investigation, the physical contamination of soils due to the abrasion of Pb bullets passing through berm soil was quantified through a field experiment. Weathering studies were performed using Pb powder to simulate abraded Pb. The effects of soil properties on abraded Pb weathering were examined by XRD patterns after incubation. Physical abrasion of lead bullets passing through soil contributes significantly to soil Pb contamination in shooting ranges. XRD patterns show that the Pb powder transformed to hydrocerussite within the first week. Soil pH, moisture level, and organic matter played a significant role in the transformation of metallic Pb to reactive Pb compounds. Our research has clearly demonstrated that Pb contamination as well as Pb transformation in shooting range soils occurs rapidly in newly opened ranges. Therefore, it is important to develop best management practice to minimize the adverse impacts of Pb in all shooting ranges regardless of their ages.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 10:00 am

Keywords:

Pb, physical abrasion, weathering, hydrocerussite