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**NATURAL ATTENUATION OF TRACE METALS IN A CONTAMINATED STREAM,
ENOREE RIVER BASIN, SOUTH CAROLINA**

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Trace metals are important contaminants in a river system because they can have a major impact on the biotic composition of the system. In most rivers trace metal concentrations are quite low, making sample contamination a major problem when investigating the fate and transport of metals in a river system. However, a galvanizing plant in the community of Travelers Rest, Greenville, SC is discharging the trace metals Zn, Mn, Al, and Fe into the headward portion of the Enoree River at concentrations in the mg/L range. The continuous discharge of this effluent from the plant provides the opportunity to study the natural attenuation of trace metals in a fluvial system. The contaminated stream was sampled at eight localities along its 8 km length. Additional samples collected elsewhere in the watershed determined that background concentrations of Zn are less than 1 $\mu\text{mol/L}$, and Al, Fe, and Mn are normally below detection limits. In the vicinity of the galvanizing plant, however, Zn concentrations range from 100-200 $\mu\text{mol/L}$, Al concentrations generally range from 20-50 $\mu\text{mol/L}$, Mn ranges from 30-50 $\mu\text{mol/L}$, and Fe concentrations range from 4-8 $\mu\text{mol/L}$. These concentrations are far higher than what would normally be expected for a small first-order stream. Metal concentrations decrease downstream to background levels near the confluence of the Enoree with the North Enoree River. Concentrations of these metals also remain relatively constant except when they are diluted during significant rain events. The only identifiable source of Zn, Al, Mn, and Fe in the contaminated stream is the galvanizing plant. The high-grade biotite gneiss bedrock contains no known sulfide deposits. Also, no mitigation efforts are currently underway to reduce contamination. Thus, the downstream decrease in metal concentrations is the result of natural attenuation processes such as dilution, sorption to clays and organics, and storage in the floodplain.

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