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THE ROLE OF REDOX CONDITIONS ON THE REMOVAL OF WASTEWATER-DERIVED CONTAMINANTS DURING RIVER BANK FILTRATION

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ABSTRACT: Riverbank filtration (RBF) is a widely used natural process for drinking water treatment applications. RBF has been shown to be effective in moderating the peak concentrations of various contaminants in the river and, in many cases, RBF can remove these contaminants below detection levels. Recent investigations have shown the removal efficiency may depend upon the type of dominant redox conditions present in the subsurface (i.e., aerobic vs. anoxic).The objectives of this research were to investigate the role of 1) redox conditions and 2) available biodegradable carbon on the removal of selected organic micropollutants, such as pharmaceutically active compounds and chlorinated flame retardants, during subsurface treatment. Laboratory-scale column experiments were conducted to simulate degradation processes under saturated anoxic and unsaturated oxic conditions. Degradation rates for various organic contaminants were determined for anoxic and oxic conditions with differing available biodegradable organic carbon concentrations. Laboratory-scale experiments were validated with monitoring results from a demonstration-scale RBF site in Brighton, CO.

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