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**OCCURRENCE, DISTRIBUTION, AND FATE OF CONTAMINANTS OF EMERGING CONCERN THROUGH  
AN URBAN STREAM CORRIDOR, ST. VRAIN CREEK, COLORADO, 2005 AND 2006**

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**ABSTRACT:** Urban growth during the last two decades has resulted in conversion of agricultural land to urban land in and around the cities of Longmont and Boulder, Colorado. This growth has led to an increase in volume of treated wastewater being released from wastewater-treatment plants (WWTPs) in the basin. Historical water-quality monitoring in the basin did not include sampling for emerging contaminants such as detergents, disinfectants, fragrances, fire retardants, plasticizers, and nonprescription drugs. These chemicals can be released to the environment through discharges from WWTPs and other sources. In the spring of 2005 and 2006, the U.S. Geological Survey in cooperation with the City of Longmont investigated selected emerging contaminants in a 13.8 mile reach of St. Vrain Creek that brackets most of the developed area of Longmont. Seven sites were sampled following a Lagrangian design, with sites located upstream and downstream of the Longmont WWTP outfall and the primary contributing tributaries, at the Longmont WWTP outfall, and at the mouths of the tributaries, Left Hand Creek and Boulder Creek (which is influenced by multiple WWTP outfalls). The Longmont WWTP receives human waste and industrial waste from poultry and dairy operations and biotechnology and metal processing facilities. Of the 63 emerging contaminants analyzed, 36 compounds were detected in one or more samples. For mainstem sites, from one to 12 compounds were detected upstream of the WWTP outfall and 25 to 34 compounds were detected downstream from the outfall. Between 20 and 25 compounds were detected in the two tributaries and 34 compounds were detected in the WWTP outflow for both sample events. In 2005, higher streamflow was associated with fewer emerging contaminant detections but larger emerging contaminant loads in St. Vrain Creek and its tributaries when compared to 2006. Loads of selected emerging contaminants, such as certain detergent metabolites, decreased between upstream and downstream sites while others, such as fire retardants and plasticizers, exhibited conservative behavior resulting in increased loads at downstream sites. Identifying the occurrence, distribution, and fate of emerging contaminants in urban streams will aid stakeholders in addressing source-control and reduction efforts.

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