Organic Compounds in Raw Wastewater & STE from Single Sources

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Abstract. Pharmaceuticals and consumer product chemicals are present in low levels in the environment. They have been shown to have adverse effects on exposed ecosystems, sometimes associated with the endocrine system. These chemicals originate in wastewater, and while numerous studies have focused on municipal wastewater treatment plants, few studies have quantified their occurrence in onsite wastewater treatment systems from single sources. The current research objectives are to: (1) quantify the occurrence of pharmaceuticals and consumer product chemicals in raw wastewater and septic tank effluent (STE) from residential single-source OWS; (2) identify variations in wastewater strength due to geographic location; and (3) determine if differences exist in wastewater strength due to the age of the occupants. Three regions (The West, The Midwest/North and The South) were used in the analysis, with Colorado, Minnesota and Florida chosen as representative states. Collection vessels were installed on the sewer line between the residence and the septic tank. A mobile sampling unit was used to sample the raw waste stream based on flow events, and an autosampler was used to collect time weighted samples of the STE. Several organic compounds are of interest, including caffeine, 4-Nonylphenol, and triclosan. The preliminary results show no apparent trends based on the age of the occupants, or between the raw waste stream and the STE. Concentrations were found to range from 32 to 950 µg/L for caffeine, from below detection to 227 µg/L for triclosan, and from 6 to 133 µg/L for 4-Nonylphenol.