

## Chemical-Based Fecal Source Tracking Methods

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### INTRODUCTION

A useful source tracking approach that has emerged over the past few years involves detection of human-specific chemicals found in wastewaters and septage. Chemicals specific to human wastewaters offer some potential advantages over biologically based methods: they are generally faster to prepare and analyze; they are more source-specific because they are not confounded by regrowth in the environment; and chemicals may be more geographically and temporally stable. However, chemicals have received less scrutiny to date, often require specialized equipment, and sample processing is usually more expensive. Additionally, many chemicals specific to human waste streams may occur at concentrations low enough to be diluted below detection limits once the waste stream enters the ambient environment. This chapter describes the different classes of wastewater chemicals and explores the advantages, disadvantages of each as potential source tracking candidates. While no single chemical has emerged as the best, there are several viable candidates for source tracking applications. For initial water sample screenings, optical brighteners (OBs) in detergents have shown considerable promise. Although not as sensitive as most microbial assessments, OBs can be measured with a handheld fluorometer, providing near real-time and relatively inexpensive tracking of signals in the field if the sample contains an OB concentration large enough to produce a measurable signal. Fecal sterols and stanols have been found to work best for source attribution, correlating with fecal indicator bacteria and providing discrimination between humans and several other fecal sources.

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