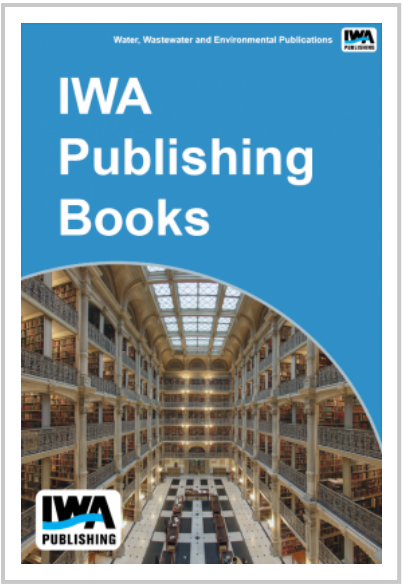
Characterizing the Quality of Effluent and Other Contributory Sources During Peak Wet Weather Events



This study evaluates the impacts of blending practices at municipal wastewater treatment plants on effluent and receiving water quality, and estimates public health risks associated with recreation in surface waters receiving blended flows. Field samples were collected at four municipal wastewater treatment plants for in-plant processes and receiving waters during wet weather blending, wet weather non-blending, and dry weather events. Laboratory analyses for Giardia, Cryptosporidium, viruses (adenovirus, enteric viruses, rotavirus, norovirus), pathogen indicator organisms (fecal coliform, E. coli, enterococcus, and male specific coliphage), and other water quality parameters were performed on these samples. Field sample results for the East Bay Municipal Utility District's (EBMUD) Main Wastewater Treatment Plant were used to develop a hydrodynamic and water quality computer models to predict receiving water conditions and a quantitative microbial risk assessment (MRA) to evaluate increased risks of gastrointestinal and respiratory infections for people recreating in waters receiving blended flows.

EBMUD field sampling results indicated that Giardia and adenovirus concentrations in plant final effluent increased during wet weather blending events in comparison to non-blending events, and so receiving water modeling was conducted for these organisms. T-test results indicated that the differences between blending and non-blending were not considered to be statistically significant for any of the pathogen and indicator organisms except Giardia cysts (enumeration). Additionally, TSS, cBOD5 and particle concentrations from final effluent grab samples also appeared higher during blending events, but no increase was observed in VOC levels during these periods, and no NPDES permit limits were exceeded. An estimate of the incremental annual number of infections associated with blending practices at EBMUD's wastewater treatment plant was developed based on two pathogens (adenovirus and Giardia spp.) and three exposure sites. Estimated individual risk per exposure event for people recreating in waters receiving blended flows were greater by about an order-of-magnitude (10x) at the EBMUD MWWTP Outfall location and less than an order-of-magnitude (10x) at three other exposure sites, than if these blended flows received full secondary biological treatment during wet weather conditions. Thus the relative increase of annualized risk appeared negligible, at less than one infection annually assuming 100 exposure events per day for 30 blending days per year.

Available as ebook only

Also available as part of your Water Inteligence Online subscription

Publication Date: 10/03/2010
ISBN13: 9781843392989
eISBN: 9781780403533
Pages: 150

Print:
Standard price: £29 / €36 / $44
Member price: £22 / €27 / $33

eBook:
Standard price: £29 / €38 / $50
Member price: £22 / €29 / $38