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Studying Chemicals of Concern in Iowa's Water

IOWA CITY Iowa (April 19, 2006) — Iowa's water is not tested for many chemicals that can be found, researchers noted Wednesday in a new report.

Current water-quality testing concentrates on several pollutants. However, recent research has shown many compounds not previously considered contaminants are present in Iowa's water, according to the report from the Iowa Policy Project (IPP).

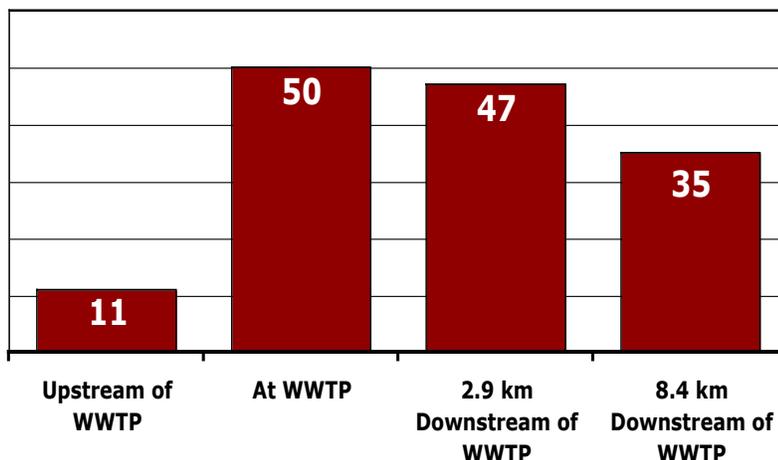
These compounds include human and veterinary prescription drugs, diagnostic agents, hormones, cosmetics, dyes, preservatives, detergents, and numerous other organic compounds.

“There are increasing concerns about the potential environmental effects that may occur from such ‘emerging contaminants,’” said Doug Schnoebelen, a U.S. Geological Survey (USGS) research hydrologist, University of Iowa adjunct professor of Geoscience and Engineering, and co-author of the IPP report. The report, *Chemicals of Concern*, summarizes these contaminants and describes an Iowa research site selected for their study.

Fourmile Creek near Ankeny, Iowa, was initially sampled in a statewide study in 2001 (in collaboration with the Iowa Geological Survey) for select emerging contaminants to determine the effect of urban areas on the concentration of emerging contaminants. This study found three emerging contaminants upstream of the Ankeny wastewater treatment plant and 31 downstream (Note: The Ankeny wastewater treatment plant is meeting all current regulations and these results are representative of contributions from wastewater treatment plants to streams in Iowa and across the nation.)

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Number of Emerging Contaminants Detected at Various Locations of Fourmile Creek



*WWTP = Wastewater Treatment Plant

Primary Uses of Emerging Contaminants Tested:

Antacid, insect repellent, gasoline component, antibiotic, wood preservative, antidiabetic, fragrance, caffeine metabolite, domestic pest control, antihistamine, pesticide, nicotine metabolite, plasticizer, antiinflammatory, herbicide, fire retardant, antiasthmatic, degreaser, detergent metabolite, antidepressant, etc.

A variety of hydrologic factors led to Fourmile Creek being part of ongoing studies by the USGS to better understand the occurrence of these compounds, what happens to them once they enter the environment, and their potential effects on aquatic ecosystems. IPP, the U.S. Environmental Protection Agency, Iowa Geological Survey, and several local agencies are collaborating at the Fourmile Creek research site.

“The effects of emerging contaminants on aquatic organisms are difficult to measure because concentrations of these compounds are generally low and, over the life of the organism, may produce no acutely toxic effects. However, detrimental effects to organisms from emerging contaminants may be subtle and go unnoticed until some cumulative threshold is reached,” said coauthor Dana Kolpin, a USGS research hydrologist and project chief of the USGS’s emerging contaminants project.

One area of concern is emerging contaminants that affect human and animals’ “key control system,” the endocrine system. For example, nonylphenol (a detergent degradation product found in laundry and dish detergents), and AHTN (a polycyclic musk found in perfumes, laundry products, air fresheners and cosmetics) have been shown to disrupt reproduction and growth in fish by affecting the endocrine system.

Antibiotics, which are commonly used in humans and animals to fight bacterial infections, as well as being used in livestock to promote rapid growth, are a second area of concern. Because antibiotics are only partially metabolized by humans and animals, high concentrations remain in their urine and feces. These can enter the environment and may contribute to a decrease in antibiotics’ effectiveness.

“Bacteria’s resistance to antibiotics may also increase with the glut of new products available that include antimicrobial disinfectants such as liquid soaps, dishwasher powders and plastics,” Schnoebelen said. “By increasing the antibiotic resistance of bacteria, these chemicals may also reduce algae diversity in streams and affect natural ecosystem functions such as soil microbial activity.”

IPP Executive Director David Osterberg said the new report is groundbreaking for public understanding of the issue.

“Science is just beginning to understand emerging contaminants and their effects. It is important to continue this research and support work being done at Fourmile Creek, which has established Iowa as a center for this kind of research,” Osterberg said.

The Iowa Policy Project is a nonprofit, nonpartisan research organization dedicated to promoting public policy that fosters economic opportunity while safeguarding the health and well-being of Iowa’s people and environment. IPP reports are available at www.iowapolicyproject.org.

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