

## Planning for a Regional Water Reuse Ordinance

Water use in much of the Great Lakes region is not consistent with sustainable growth concepts. For example, in the past the Chicago diversion from Lake Michigan has exceeded the decreed limit, and most of the water is used in applications that do not demand high-quality water. Furthermore, the water and wastewater treatment processes dissipate a substantial amount of energy. Wastewater reuse in the Chicago metropolitan area could reduce the costs of municipal (drinking) water treatment, reduce the costs of wastewater treatment, reduce the amount of water diverted from Lake Michigan, and result in significant energy savings.

Comprehensive planning for wastewater reuse is a multi-objective decision process that includes diverse issues with potential conflicts. There are, for example, treatment and distribution costs for municipal (drinking) water and for treated wastewater, and these costs depend on the distance between the water source and the reuse application. Furthermore, the flow of the Chicago River system affects transportation, habitat, water quality, and hydroelectric capacity, and these issues need to be considered. Finally, there are risk management and public perception/education issues that must be addressed whenever water reuse is promoted.

A cooperative study involving IIT, the Chicago Metropolitan Agency for Planning, and the Illinois Waste Management and Research Center, headed by Professor Paul Anderson (ChBE), is developing a multi-objective decision model for urban water use, which can lay the foundation for a water reuse ordinance in the Chicago metropolitan area. In the initial phase of the project, existing technological, economic, societal, and environmental incen-

tives and barriers to wastewater reuse were evaluated. The completed decision model will help in understanding the relative weights associated with these issues, and plan effective, long-term sustainable water use. Short-term success of the project can be defined in terms of the model development. Long-term success can be measured in terms of the volume of wastewater reuse, decreased withdrawal from Lake Michigan, energy savings, and their associated economic benefits.

Methods and information developed from this study will be presented through planning entities (the Chicago Metropolitan Agency for Planning in northeast Illinois) and technology transfer (the Illinois Waste Management and Research Center). The project has numerous direct beneficiaries in the Chicago Metropolitan area including the City of Chicago, commercial and industrial entities opting for more choices in water and energy supplies, water and wastewater utilities planning for future growth, and the students and faculty involved in the research. We expect the methodology developed in this research will also have applications and bring benefits to other established urban centers that need to plan for sustainable water use, and all regional residents who make use of Great Lakes water resources.

### FOR MORE INFORMATION...

**Dr. Paul Anderson**  
**Chemical and Biological**  
**Engineering**  
**312.567.3531**  
**[andersonp@iit.edu](mailto:andersonp@iit.edu)**