



Overview of Wastewater Treatment

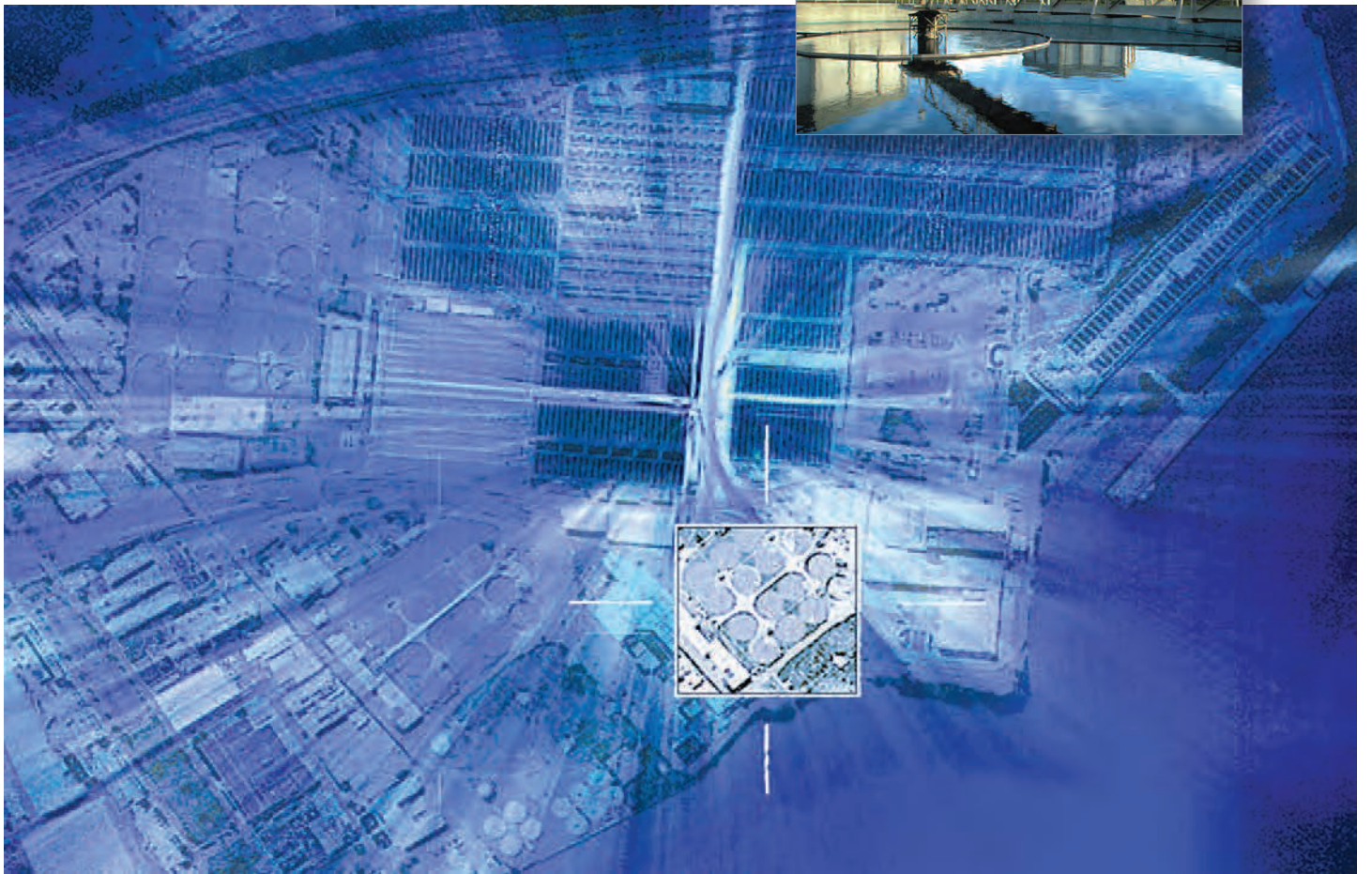
An Online Continuing Education Course for Engineers

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The Need for Wastewater Treatment

Wastewater treatment is needed so that we can use our rivers and streams for fishing, swimming and drinking water. For the first half of the 20th century, pollution in the Nation's urban waterways resulted in frequent occurrences of low dissolved oxygen, fish kills, algal blooms and bacterial contamination. Early efforts in water pollution control prevented human waste from reaching water supplies or reduced floating debris that obstructed shipping. Pollution problems and their control were primarily local, not national, concerns. Since then, population and industrial growth have increased demands on our natural resources, altering the situation dramatically. Progress in abating pollution has barely kept ahead of population growth, changes in industrial processes, technological developments, changes in land use, business innovations, and many other factors. Increases in both the quantity and variety of goods

produced can greatly alter the amount and complexity of industrial wastes and challenge traditional treatment technology. The application of commercial fertilizers and pesticides, combined with sediment from growing development activities, continues to be a source of significant pollution as runoff washes off the land.

Water pollution issues now dominate public concerns about national water quality and maintaining healthy ecosystems. Although a large investment in water pollution control has helped reduce the problem, many miles of streams are still impacted by a variety of different pollutants. This, in turn, affects the ability of

people to use the water for beneficial purposes. Past approaches used to control water pollution control must be modified to accommodate current and emerging issues

Effects of Wastewater on Water Quality

The basic function of the wastewater treatment plant is to speed up the natural processes by which water purifies itself. In earlier years, the natural treatment process in streams and lakes was adequate to perform basic wastewater treatment. As our population and industry grew to their present size, increased levels of treatment prior to discharging domestic wastewater became necessary.



(Data from U.S. Public Health Service multi wastewater inventories;
2000 USEPA Clean Watershed Needs Survey)

Population Receiving Different Levels of Wastewater Treatment

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- Population growth is taxing many existing wastewater treatment systems and creating a need for new plants;
- Farm runoff and increasing urbanization provide additional sources of pollution not controlled by wastewater treatment; and
- One third of new development is served by decentralized systems (e.g., septic systems) as population migrates further from metropolitan areas.

Collecting and Treating Wastewater

The most common form of wastewater pollution control in the United States consists of a centralized system of sewers and wastewater treatment plants. Sewers collect municipal wastewater from homes, businesses, and industries and deliver it to facilities for treatment before it is discharged to water bodies or reused.

Decentralized Collection

In the early days of our nation's history, people living in rural areas and small cities and towns used cesspools to dispose of wastewater. Cities began to install wastewater treatment systems in the late 19th century because of growing awareness of disease and the health benefits of indoor plumbing and flush toilets.

The use of sewage collection systems brought dramatic improvements to public health, further encouraging the growth of metropolitan areas. In the year 2000 approximately 208 million people in the U.S. were served by centralized collection systems.