



Future Investment in Drinking Water and Wastewater Infrastructure

November 2002

The Congress of the United States ■ Congressional Budget Office

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Notes

Numbers in the text and tables may not add up to totals because of rounding.

Unless otherwise indicated, all costs referred to are in 2001 dollars.

Cover photo shows chlorine contact tanks at a wastewater treatment plant within the Delta Diablo Sanitation District, Antioch, California. ©Paul Cockrell.



Preface

According to experts from the Environmental Protection Agency and various nonfederal groups, the nation's drinking water and wastewater systems face increasing challenges over the next several decades in maintaining and replacing their pipes, treatment plants, and other infrastructure. But there is neither consensus on the size and timing of future investment costs nor agreement on the impact of those costs on households and other water ratepayers.

The Congressional Budget Office (CBO) has analyzed those issues at the request of the Chairmen and Ranking Members of the Subcommittee on Water Resources and Environment of the House Committee on Transportation and Infrastructure and the Subcommittee on Environment and Hazardous Materials of the House Committee on Energy and Commerce. This study provides background information on the nation's water systems, presents CBO's estimates of future costs for water infrastructure under two scenarios—a low-cost case and a high-cost case—and discusses broad policy options for the federal government. In keeping with CBO's mandate to provide objective, impartial analysis, this report makes no recommendations.

The study was written by Perry Beider and Natalie Tawil of CBO's Microeconomic and Financial Studies Division, under the supervision of David Moore and Roger Hitchner. Many people within CBO and outside it provided valuable assistance; they are acknowledged in Appendix D.

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Director

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The 4 Percent Benchmark for Affordability

The Environmental Protection Agency has never adopted a measure to indicate how much an individual household can pay for water services before they become unaffordable. Yet participants in the current debate use (and attribute to EPA) the assumption that any household with water bills in excess of 4 percent of its income is experiencing a hardship. In adopting that notion, they mistakenly apply to individual households “affordability criteria” that the agency developed for whole water systems.

The distinction is important because EPA’s criteria compare the revenues collected by a water system to the median household income (MHI) in a service area, not to individual household income. Certainly, average household costs that correspond to 4 percent of a community’s MHI represent an even higher percentage of the income of an individual household earning less than the median. Thus, EPA’s (subjective) judgment that 4 percent of MHI is a reasonable ceiling on a water system’s yield does not translate into a judgment that each individual household served by that system should pay no more than 4 percent of its income for water services.

The 4 percent benchmark reflects EPA’s separate figures of 2 percent each for wastewater and drinking water. The origins of those individual figures highlight the subjectivity inherent in setting affordability criteria.

EPA’s Affordability Criterion for Wastewater Systems

EPA’s guidance on the affordability of investment in wastewater systems uses an average household rate of

2 percent of MHI as one assessment factor in conjunction with measures of the system’s debt, socioeconomic conditions of the area, and financial management conditions.¹ The focus on affordability at the system level is also reflected in the guidance’s reference to a 1988 study examining municipal governments’ ability to issue revenue bonds to finance environmental compliance. EPA assumed that lending institutions would initially be reluctant to accept ratios of user fees to income that were much above those already in existence in most communities, but the agency was clearly not concerned about whether individual households could afford higher rates—it asserted that as new environmental regulations gained wider acceptance, lenders would not be put off by higher ratios.²

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1. See Environmental Protection Agency, Office of Water, Office of Wastewater Management, “Combined Sewer Overflows—Guidance for Financial Capability Assessment and Schedule Development,” EPA 832-B-97-004 (February 1997).
 2. Financial markets do not use a household-level affordability criterion in determining a system’s overall financial condition and credit capacity. But they do consider whether rates that are comparatively low for a region may constrain asset maintenance and whether rates that are too high may limit expansion of the industrial customer base. Rate assessments allow for timely capital improvement plans and rates that reflect the full cost of service. In addition to rates, financial analysts examine the diversity and breadth of a system’s customer base, the strength of the local economy, the system’s governance and organizational structure, the quality of its management and strategic focus, and its liquidity. See Mary Francoeur, Chee Mee Hu, and Thomas Paolicelli, *Rating Methodology: Analytical Framework for Water and Sewer System Ratings* (Moody’s Investor Service, Municipal Credit Research, August 1999). Conversation with Chee Mee Hu, December 17, 2001.

EPA's Affordability Criterion for Drinking Water Systems

EPA was led to establish an affordability criterion for drinking water systems by the 1996 Amendments to the Safe Drinking Water Act. The amendments specified that small public drinking water systems would be allowed to use less effective pollutant control technologies when designated technologies capable of achieving a maximum contaminant level for a pollutant or satisfying a treatment technique requirement were not "affordable." EPA judged that a technology was not affordable for a small system if the associated average expense per household served exceeded 2 percent of the service area's MHI.

EPA settled on 2 percent after seeking a value that would be "closer to the cost of other utilities, and not significantly less than the cost of specific discretionary items."³

3. See International Consultants and others, "National Level Affordability Criteria Under the 1996 Amendments to the Safe Drinking Water Act (Final Draft Report)," USEPA Contract 68-C6-0039 (August 1998), pp. 6-2, 4-6; and Environmental Protection Agency, Office of Water, "Variance Technology Findings for Contaminants Regulated Before 1996," EPA 815-R-98-003 (September 1998), p. 19.

Consumer expenditures on alcohol and tobacco represented 1.5 percent of 1995 pretax MHI, and expenditures on energy and fuels accounted for 3.3 percent.⁴ From that range, the agency selected 2 percent, in part because it was roughly consistent with the premium that some households were choosing to pay when installing a drinking water treatment device or purchasing bottled water.⁵

EPA recently decided to raise the value to 2.5 percent of MHI, which highlights the subjective underpinnings of the agency's affordability criterion. The change allows EPA to designate point-of-use treatment devices as "compliance technologies" because it ensures that average household charges by small systems installing such devices would remain below the affordability criterion. In effect, the change limits the recourse of small drinking water systems to less effective pollutant control technologies.

4. Environmental Protection Agency, Office of Water, "Variance Technology Findings," p. 45.

5. International Consultants, "National Level Affordability Criteria," p. 4-3.