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Small Systems Working Group Members

Kevin Brown
Division of Drinking Water
Utah Department of Environmental
Quality

Jack Bryck
Dayton & Knight, Ltd.

Judy Chambers
Borough Manager, Mercersburg, PA

Mary Gaiski
Pennsylvania Manufactured Housing
Association

Jason Gray
Virginia Water Project, Inc.

Robert Hinton
Public Staff
North Carolina Utilities Commission

Diane Kiesling
Commissioner
Florida Public Service Commission

Ted Michaels
Natural Resources Group
National Governors' Association

David Monie
SB Water Company, NJ

Gary Morgan
Rural Utilities Services, USDA

Bridget O'Grady
Association of State Drinking Water
Administrators

Yvette dePeiza
Division of Water Supply
Mass. Dept. of Environmental Protection

Teresa Rissmiller
Mount Joy Township Authority, PA

John P. Scheltens
City of Hot Springs, SD

Peter E. Shanaghan
Office of Groundwater and Drinking
Water, U.S. EPA

Jim Sheldon
Cedar-Knox Rural Water Project, NE

Donna Shell
Environmental Information Center, VA

Rich Siffert
Drinking Water Division
Washington Department of Health

Gerald Smith
Drinking Water Protection
Minnesota Department of Health

William A. VanDeValk
Lamont, VanDeValk Engineers, P.C.

Julie Ward
Great Lakes Rural Community Assistance
Program

Rita Wayco
U.S. EPA, Region 4

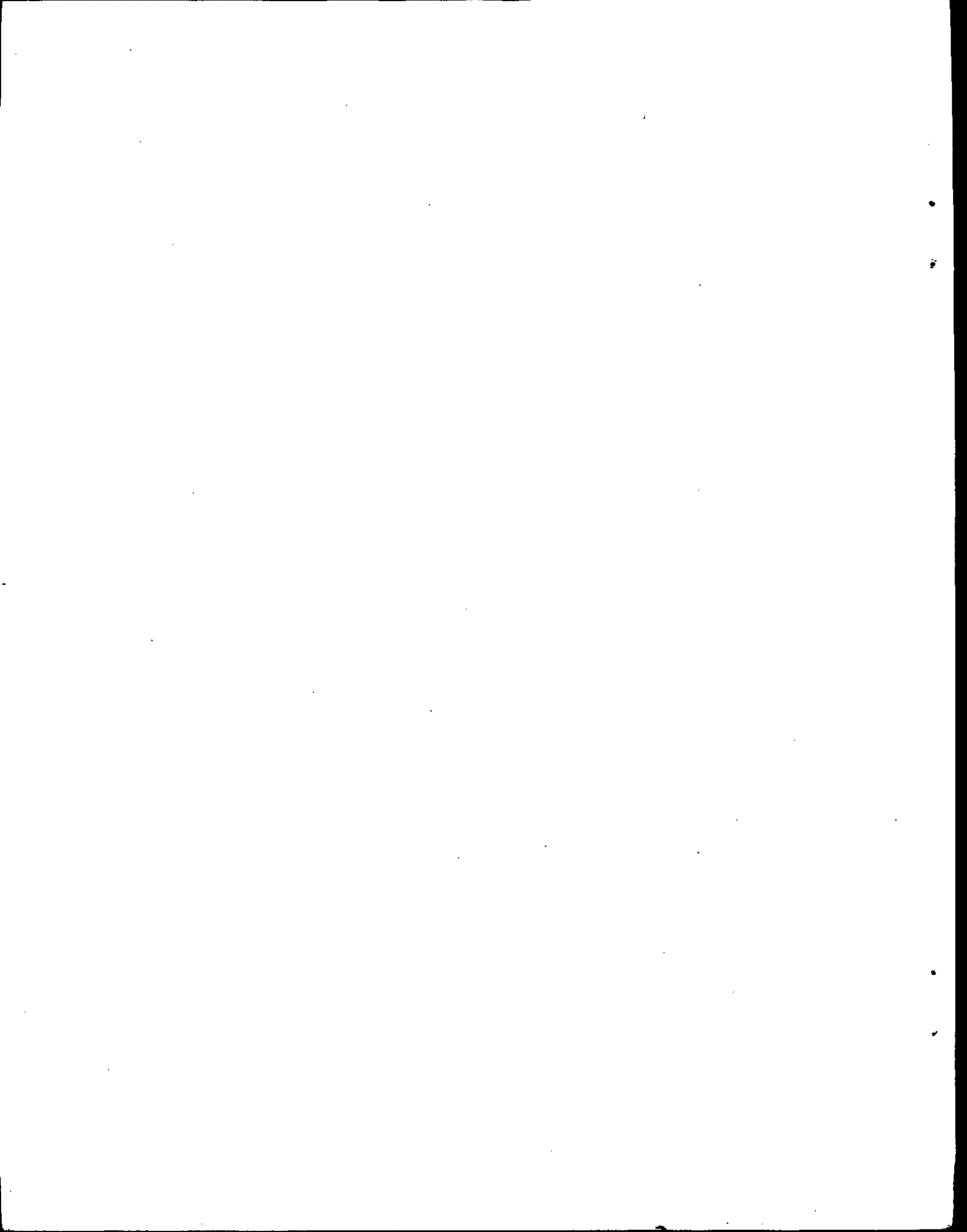
Table of Acronyms

Acronym	Meaning
AHERA	Asbestos Hazard Emergency Response Act
AMHI	Adjusted Median Household Income
AMWA	Association of Metropolitan Water Agencies
ASDWA	Association of State Drinking Water Administrators
AUC	Annual User Charges
AWWA	American Water Works Association
BAT	Best Available Technology
CCE	Comprehensive Compliance Evaluation
CCN	Certificates of Convenience and Necessity
CCP	Composite Correction Program
CCR	Consumer Confidence Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CG	Capitalization Grant
CIP	Capital Improvement Plan
CPE	Comprehensive Performance Evaluations
CWS	Community Water System
DEP	Department of Environmental Protection
DOH	Department of Health
DWRSF	Drinking Water State Revolving Fund
EDU	Equivalent Dwelling Unit
EPA	Environmental Protection Agency
EWS	Early Warning System
FVT	Financial Viability Test
G&A	General and Administrative
GO Debt	General Obligation Debt
IRS	Internal Revenue Service
IUP	Intended Use Plan
LIHEAP	Low-Income Home Energy Assistance Program
MABEL	Municipality's Ability to Pay Model
MCL	Maximum Contaminant Level
MHI	Median Household Income

Acronym	Meaning
MOU	Memorandum of Understanding
NARUC	National Association of Regulatory Utility Commissioners
NAWC	National Association of Water Companies
NCWS	Noncommunity Water Systems
NDWAC	National Drinking Water Advisory Council
NETA	National Environmental Training Association
NPDWR	National Primary Drinking Water Regulations
NRRI	National Regulatory Research Institute
NRWA	National Rural Water Association
NTNCWS or NTNC	Nontransient, Noncommunity Water System
O&M	Operations and maintenance cost
OGWDW	Office of Ground Water and Drinking Water
PACNIF	a financial capabilities model used by PENNVEST
PIPPS	Percentage-of-income payment plans
POTW	Publicly Owned Treatment Works
PUC	Public Utility Commission
PWS	Public Water System
RCAP	Rural Community Assistance Programs
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RUS	Rural Utility Service
S&P	Standard & Poors
SDWA	Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SRF	State Revolving Fund
TNCs or TNCWS	Transient Noncommunity Water Systems
TNRCC	Texas Natural Resource Conservation Commission
TSC	Target Service Charge
WAC	Washington Administrative Code
WQS	Water Quality Standards
WUFS	Water Utility Financing Study

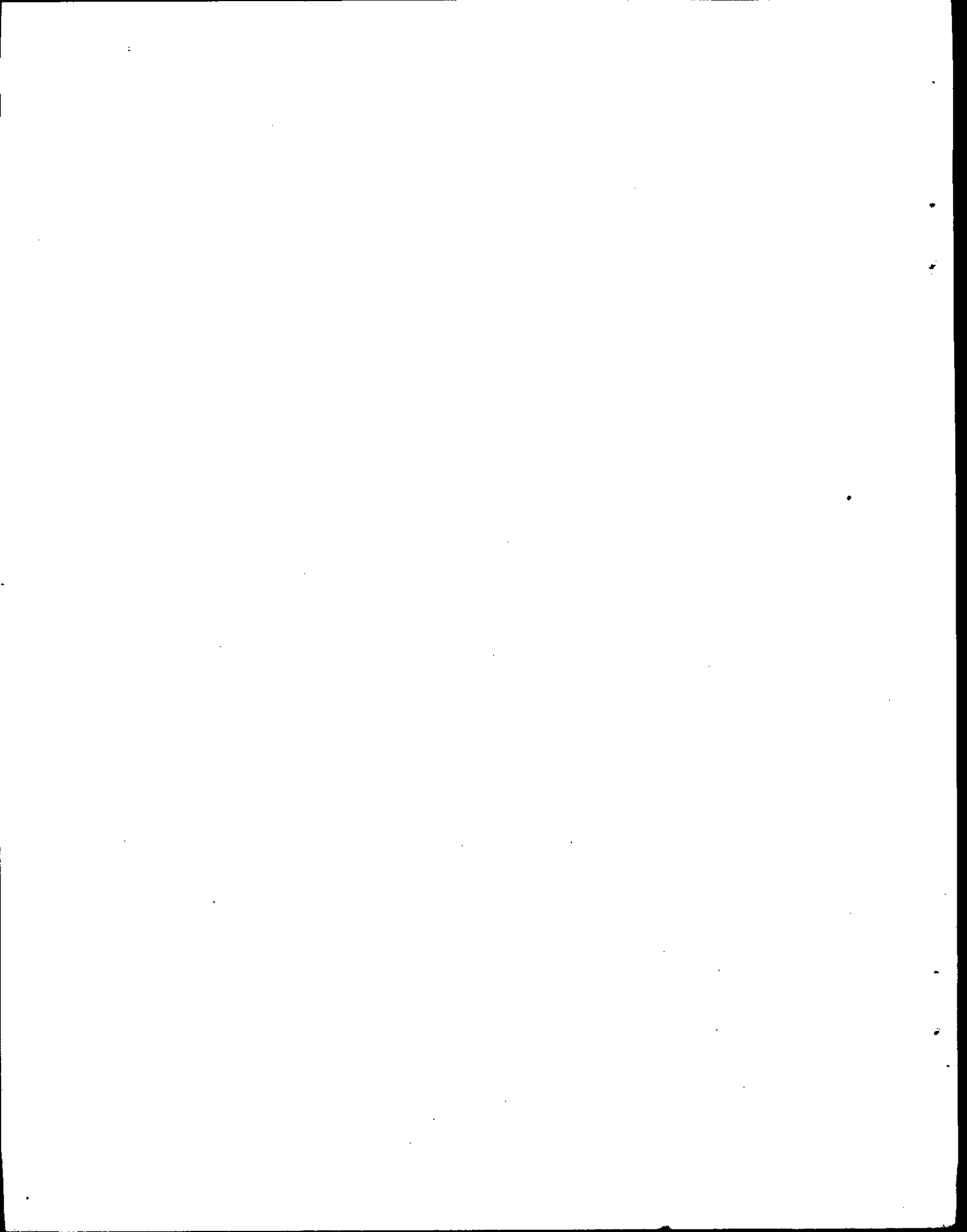
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CHAPTER 1:

Introduction to Technical, Managerial, and Financial Capacity of Water Systems



INTRODUCTION

The 1996 Safe Drinking Water Act (SDWA) Amendments bring significant improvements to the national drinking water program. Capacity development is an important component of the Act's focus on prevention. The capacity development provisions offer a framework within which States and water systems can work together to ensure that systems acquire and maintain the technical, financial, and managerial capacity needed to achieve consistently the public health protection objectives of the SDWA. In short, capacity development is about helping systems uniformly provide safe drinking water.

The 1996 Amendments emphasize technical, managerial, and financial capacity as integral components of the implementation strategies of the Act. By enhancing and ensuring the technical, financial, and managerial capacity of water systems, States will promote compliance with National Primary Drinking Water Regulations (NPDWRs). To avoid a reduction in its Drinking Water State Revolving Fund (DWSRF) allotment, each State is required to obtain legal authority or other means to ensure that new systems have adequate capacity, and to develop and implement a strategy to assist existing systems in acquiring and maintaining capacity. This requirement is specified in the Act as follows:

- **Section 1420(a): STATE AUTHORITY FOR NEW SYSTEMS-** *A State shall receive only 80 percent of the allotment that the State is otherwise entitled to receive under section 1452 (relating to State loan funds) unless the State has obtained the legal authority or other means to ensure that all new community water systems and new nontransient, noncommunity water systems commencing operation after October 1, 1999, demonstrate technical, managerial, and financial capacity with respect to each national primary drinking water regulation in effect, or likely to be in effect, on the date of commencement of operations.*
- **Section 1420(c): CAPACITY DEVELOPMENT STRATEGY- (1) IN GENERAL-** *Beginning 4 years after the date of enactment of this section, a State shall receive only--(A) 90 percent in fiscal year 2001; (B) 85 percent in fiscal year 2002; and (C) 80 percent in each subsequent fiscal year, of the allotment that the State is otherwise entitled to receive under section 1452 (relating to State loan funds), unless the State is developing and implementing a strategy to assist public water systems in acquiring and maintaining technical, managerial, and financial capacity.*

The Act also provides that the Environmental Protection Agency (EPA) will assist State capacity development efforts by providing information and guidance:

- **Section 1420(d): FEDERAL ASSISTANCE-(1) IN GENERAL-** *The Administrator shall support the States in developing capacity development strategies. (2) INFORMATIONAL ASSISTANCE- (A) IN GENERAL-* *Not later than 180 days after the date of enactment of this section, the Administrator shall--(i) conduct a review of State capacity development efforts in existence on the date of enactment of this section and publish information to assist States and public water systems in capacity development efforts. . . . (4) GUIDANCE FOR NEW SYSTEMS-* *Not later than 2 years after the date of enactment of*

this section, the Administrator shall publish guidance developed in consultation with the States describing legal authorities and other means to ensure that all new community water systems and new nontransient, noncommunity water systems demonstrate technical, managerial, and financial capacity with respect to national primary drinking water regulations.

Aiding the technical, financial, and managerial capacity of small water systems offers great potential for correcting and preventing their noncompliance with NPDWRs and for ensuring their provision of reliably safe drinking water. The capacity development provisions in the Act offer a simple, flexible framework within which States can organize their efforts to address the challenges facing small systems. Each state has extraordinary flexibility to implement a capacity development program that is uniquely tailored to its circumstances.

The statute specifies that new systems must demonstrate technical, managerial, and financial capacity prior to commencing operation, and States must develop and implement strategies to assist public water systems in acquiring and maintaining technical, managerial, and financial capacity. The statute lists several specific issues which a State must consider and solicit public comment on when preparing its capacity development strategy. The statute does not dictate what a State strategy must contain.

This chapter presents the background information necessary to understand the information documents that are provided in Chapters 2 through 4 to assist states in implementing the capacity development provisions of the Act.

Included in this introductory chapter are a discussion of the demographics of systems affected by the provisions, and working definitions of technical, managerial, and financial capacity that will be used throughout this document.

SYSTEM DEMOGRAPHICS¹

The capacity development provisions of the SDWA apply to several types of public water systems. Several provisions apply to all public water systems (PWSs), which include: 1) community water systems (CWSs); 2) nontransient, noncommunity water systems (NTNCWSs); and 3) transient, noncommunity water systems (TNCWSs). Other provisions apply only to community water systems and nontransient, noncommunity water systems.

A public water system is a "system for the provision to the public of piped water for human consumption, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year." (40 CFR §141.2) There are approximately 172,000 public water systems nationwide.

A community water system is "a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents." (40 CFR §141.2) There are approximately 55,000 community water systems serving over 246 million people. Approximately 20 percent of these systems (serving over 157 million people) use as water sources either surface water or ground water under the direct influence of surface water. The remaining 80 percent of systems (serving almost 89 million people) receive their water from a ground water source.

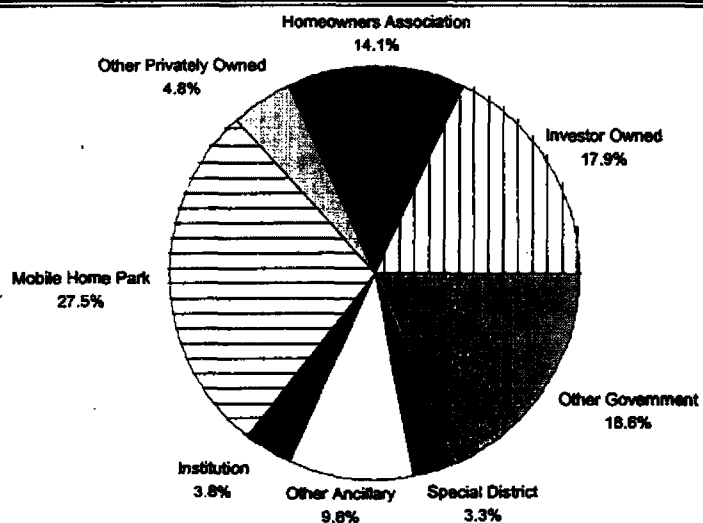
Slightly more than 86 percent of CWSs are classified as "very small" (serving fewer than 500 persons) or "small" (serving from 501 to 3,300 persons). Although the small and very small systems comprise a significant majority of CWSs, they serve just over 10 percent of the population served by CWSs. Community water systems can be classified into two major ownership types—privately owned and publicly owned. Within the privately owned category, a substantial number of systems are "ancillary systems," i.e., they provide water as an ancillary function of their principal business or enterprise. An example is mobile home parks (Figure 1). Like NTNCWSs, they provide water to their customers, but provision of water is not their principal business. The incidence of ancillary systems varies significantly by system size. In small CWSs serving between 25 and 100 persons, over half (53 percent) are ancillary systems. In larger CWSs serving more than 10,000 persons, only 0.1 percent are ancillary systems.

A nontransient, noncommunity water system is defined as "a public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year." (40 CFR §141.2) Examples of establishments served by nontransient, noncommunity water systems include schools, factories, office/industrial parks, and major shopping centers. Many are privately owned. The approximately 20,000 NTNCWSs across the nation serve approximately 6 million people. Over 96 percent of NTNCWSs use ground water as their primary source. They typically are small systems; 99 percent of NTNCWSs are classified as "very small" or "small."

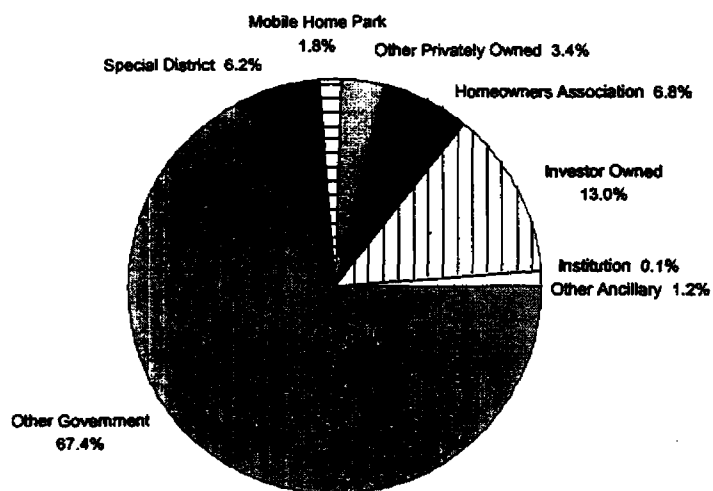
¹ Data Source: Safe Drinking Water Information System (SDWIS)

FIGURE 1

Ownership of Systems Serving Population 25 - 500
(Percent of Systems)



Ownership of Systems Serving Population > 500
(Percent of Systems)



DEFINING CAPACITY

Water system capacity is the capability to function as a water system in accordance with accepted performance criteria. Capacity encompasses the technical, managerial, and financial capability of the water system to plan for, achieve, and maintain compliance with applicable drinking water standards given available water resources and the characteristics of the service population.

Technical, managerial, and financial capacity are three general, highly interrelated areas of water system capacity:

- *Technical capacity refers to the physical infrastructure of the water system, including but not limited to the adequacy of the source water, infrastructure (source, treatment, storage, and distribution), and the ability of system personnel to implement the requisite technical knowledge.*
- *Managerial capacity refers to the management structure of the water system, including but not limited to ownership accountability, staffing and organization, and effective linkages.*
- *Financial capacity refers to the financial resources of the water system, including but not limited to revenue sufficiency, credit worthiness, and fiscal controls.*

KEY QUESTIONS

Technical, managerial, and financial capacity are individual yet highly interrelated areas of a system's capacity, as illustrated in Figure 2. A system cannot sustain capacity without maintaining adequate capability in all three areas. Indicators of capacity within each area can be framed by key sets of issues and questions, including but not limited to the following:

Technical capacity

- *Source water adequacy.* Does the finished water meet the provisions of the SDWA? Does the system have access to a reliable source of drinking water? Is the source adequately protected?
- *Infrastructure adequacy.* Can the system provide water that meets SDWA standards? What is the condition of the system's infrastructure, including well(s) and/or source water intakes, treatment, storage, and distribution? What is the life expectancy of the system's infrastructure? Does the system have a capital improvement plan?

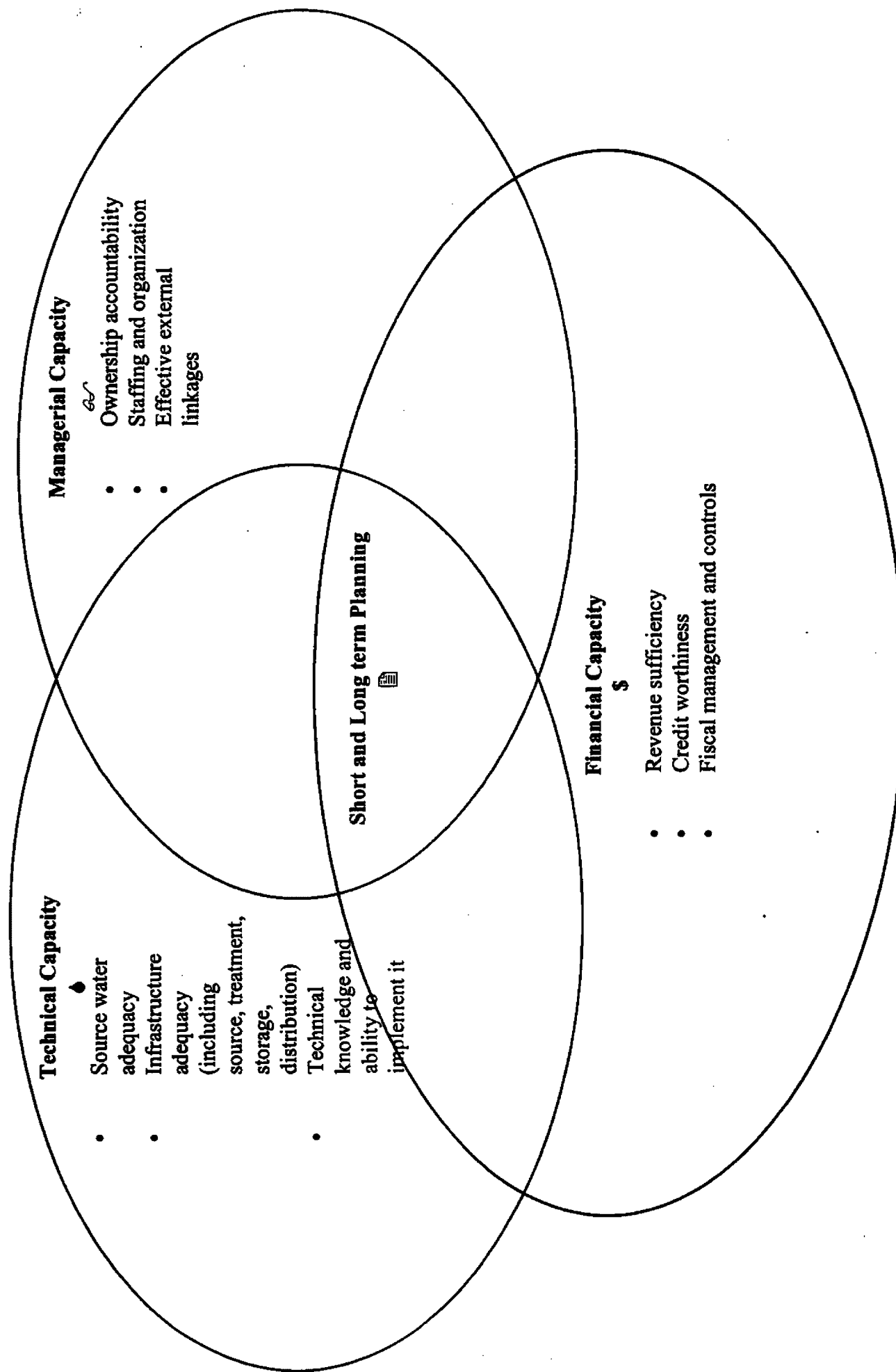


Figure 2
Technical, Managerial, and Financial Capacity

- **Technical knowledge and implementation.** Does the system have a certified operator? Is the system operated with technical knowledge of applicable standards? Are personnel able to implement this technical knowledge effectively? Do the operators understand the technical and operational characteristics of the system?

Managerial capacity

- **Ownership accountability.** Are the system owner(s) clearly identified? Can they be held accountable for the system?
- **Staffing and organization.** Are the system operator(s) and manager(s) clearly identified? Is the system properly staffed and organized? Do personnel understand the management aspects of regulatory requirements and system operations? Do personnel have adequate expertise to manage water system operations? Do personnel have the necessary licenses and certifications?
- **Effective external linkages.** Does the system interact well with customers, regulators, and other entities? Is the system aware of available external resources?

Financial capacity

- **Revenue sufficiency.** Do revenues cover costs? Are rates and charges for water service adequate to cover the cost of service?
- **Credit worthiness.** Is the system financially healthy? Does it have access to financial capital through public or private sources?
- **Fiscal management and controls.** Are adequate books and records maintained? Are appropriate budgeting, accounting, and financial planning methods used? Does the system manage its revenues effectively?

Many aspects of water system operations involve more than one kind of capacity. A program of infrastructure replacement and improvement, for example, requires technical knowledge, management planning and oversight, and financial resources. In other words, a water system with adequate capacity draws on strengths in all three capacity areas—technical, managerial, and financial.

CONCLUSIONS

The concepts of technical, managerial, and financial capacity figure prominently in the 1996 SDWA. In accordance with the Act, the States will have substantial flexibility in designing and implementing capacity development programs that best suit the needs of their citizens and water systems. The framework provided here is designed to assist that endeavor by identifying several key criteria for assessing water system capacity.

CHAPTER 2:

Information for States on Ensuring that All New CWSs and NTNCWSs Demonstrate Technical, Managerial, and Financial Capacity

INTRODUCTION

Section 1420(a) of the Act directs the Administrator to withhold a portion of a State's allotment under §1452 unless the State "has obtained the legal authority or other means to ensure that all new community water systems and new nontransient, noncommunity water systems . . . demonstrate technical, managerial, and financial capacity with respect to each national primary drinking water regulation in effect, or likely to be in effect, on the date of commencement of operations."

Under this provision, States must demonstrate legal authority or other means to ensure the capacity of new water systems. "Legal authority or other means" typically is demonstrated by reference to statutes, regulations, rules, or policies adopted by the State. This authority typically is implemented at control points in the process of new system development (e.g., the issuance of a permit for construction). At each control point, the State has the ability to ensure that creating a new water system is the most appropriate alternative for providing water service, and that newly created systems will have adequate technical, financial and managerial capacity.

The next section of this chapter, entitled "Control Points," provides an overview of these control points and the statutory or regulatory basis for this authority. The third section discusses strategies that can be used to enhance State authority. The final section presented in the chapter reviews additional issues that arise when dealing with proposed nontransient, noncommunity systems.

CONTROL POINTS

Table 1 (p.I-10) provides a summary of the control points where States can intervene in the development process to ensure new system capacity. Columns in the table provide the following information:

- A. **Basis of Authority.** Statutes, regulations, rules, or policies typically are the primary bases authority for government agencies to ensure the technical, managerial, and financial capacity of new water systems.
- B. **Agency Vested with Authority.** The governmental agency with jurisdiction to make authoritative determinations about new water system capacity.
- C. **Control Points.** The specific points in the process of developing a new water system where agencies can exercise authority to ensure capacity.
- D. **Type of Capacity Assessed.** Agencies can assess technical, financial, or managerial capacity of proposed new water systems. This column generalizes about the type of capacity assessed at each control point.

The authority vested in State and local governments varies substantially from State to State. Not every jurisdiction may find that it has adequate authority to ensure new water system

capacity. Some may find it necessary to seek more explicit or additional authority from State legislatures.

The types of authority considered in this paper are:

- State Authority for Drinking Water Quality
- State Authority for Economic Regulation of Public Utilities
- State Authority for Water Resource Management
- State Authority for Revolving Loan Funds
- State Authority for Planning and Growth Management
- State Enabling Authority for Local Government
- State Authority for Public Safety
- Local Governmental Authority For Land-Use, Planning, And Finances
- Federal Rural Utilities Authority
- Interstate Authorities and Compacts
- State Authorities to Regulate Related Businesses

The following discussion provides an overview of each of these types of authority and the agencies and control points associated with each type of authority.

State Authority for Drinking Water Quality

State Drinking Water Primacy Agency

Implementation of the provisions of the SDWA, as well as the implementation of State statutes, generally is vested in State primacy agencies. Their comprehensive jurisdiction makes State primacy agencies critical for ensuring new system capacity. Some States provide only the minimal authority required to carry out the SDWA (e.g., Alabama and Pennsylvania), while others define the primacy agency's mission in terms of broader public health objectives (e.g., Montana, Colorado, and North Carolina). In recent years, some States have added capacity concepts (e.g., Virginia and Iowa) to their statutes.

Within the broader function of water quality regulation, the State primacy agencies exercise authority related to certification, technical standards, and planning. Control points implemented by the State primacy agencies are:

- Plan and specification review and/or construction permit. State SDWA primacy agencies generally require a review of plans and specifications and/or a construction permit before construction can begin on a new public water system. The plan approval or permit process itself presents the major control point in any new system capacity assurance program, affecting all public water systems and providing an opportunity to impose additional requirements and guarantees.
- Construction requirements for springs and wells. Some States may require new systems using ground water resources to meet construction requirements for springs and wells. Meeting well-construction requirements may be a signal of technical capacity.

- **Operating permit.** In addition to approving plans and specifications and issuing construction permits, primacy agencies may grant a renewable operating permit. Primacy agencies also may grant licenses to operate a facility such as mobile home parks, nursing homes, and other supervised living facilities.
- **Operator certification.** A facility operator generally must be certified as technically competent. States vary in certification requirements for different categories of systems, as well as the requirements related to the on-site presence of the operator.
- **Approval of source water protection plan.** Primacy agencies may require new systems to submit a source water protection plan and the ability to do so may signal technical as well as managerial capacity.
- **System planning requirements.** Primacy agencies also can require a comprehensive business plan or multi-year operating plan from new water systems above and beyond the basic facilities plan.

State Authority for Economic Regulation of Public Utilities

State Public Utility Commissions

Forty-five State public utility commissions (PUCs) regulate water utilities (the commissions in Georgia, Michigan, Minnesota, North Dakota, and South Dakota do not have this authority). Commission authority usually is comprehensive for investor-owned or private water systems, although commissions in several States have some authority for publicly owned systems.

Several State commissions have addressed water system capacity by: 1) conducting a formal proceeding on small system policies (New York); 2) developing and issuing policy statements (California, Connecticut, and Pennsylvania); and 3) engaging in memoranda of understanding with sister agencies (Connecticut, Missouri, Pennsylvania, North Carolina, and Washington).

Within the broader function of economic regulation, the State PUCs exercise authority related to certification, ratemaking, and planning. Control points implemented by the State commissions are:

- **Issuance of certificate of convenience and necessity.** Most PUCs require new jurisdictional water utility systems to obtain a certificate of convenience and necessity (or need) that establishes the service territory and places other conditions on service. PUC approvals or certificate modifications also may be required for extensions of service to new developments outside the original franchise area or the boundaries of municipal systems. PUC certificates can be conditioned by the requirement of a performance bond or other financial guarantees.
- **Approval of system's investments (ratebase).** As part of the certification process, or separately, many PUCs can review the new water system's ratebase investments. Some

commissions use informal benchmarks (e.g., investment per customer) to evaluate whether the investment in the system is sufficient to maintain financial health.

- **Approval of financial structure.** Many PUCs can review the new water system's financial structure, including use of debt and equity instruments and the ratio of debt to equity. Commissions also may require a business or financial plan focused on cost-of-service, financing, and rate issues.
- **Approval of initial rates and rate design.** Whether or not the PUC certifies a new system, initial rates must be approved for all systems subject to ratemaking jurisdiction. Commission review generally focuses on whether rates adequately reflect the cost of providing service and properly balance the interests of investors and ratepayers. Rate design refers to the differentiation of rates based on class of service, amount of water usage, period of usage, and other factors.
- **System planning requirements.** The PUC role in planning varies and may be somewhat limited, even for investor-owned systems. Increasingly, however, commissions require some form of capital planning, as well as other types of system planning. Commissions also often play a review and advisory role in conjunction with planning processes required by other State agencies. In some cases, commissions may be asked to review financial aspects of plans prepared by nonjurisdictional utilities.

State Authority for Water Resource Management

State Water Resource Agency

The authority for water quantity regulation generally rests with State natural resource agencies (which in some cases may be identical to the primacy agencies). The authority of the water resources agency may be embedded within general environmental laws or in separate statutes. The nature of authority over water quantity issues varies by geographic region and by State, as do the instruments of water resource policy (e.g., rights, permits, and registration systems).

The State water resource agencies exercise authority related to permitting, planning, and environmental resource management. Control points at which State authority is implemented by water resource agencies are:

- **Withdrawal and source development permits.** Access to a reliable water source is an obvious prerequisite for drinking water systems. Water resource agencies may have authority to approve a proposed development and withdrawals, as well as water markets (sales and transfers) and supply management measures.
- **Approval of water rights.** In some States, a system of water rights governs access to and use of water resources. The State water resource agency may be involved in legal review and approving water rights or transfers of water rights from one party to another.

- **System planning requirements.** Water resource agencies may be responsible for developing, encouraging, or overseeing development of Statewide, regional, or river basin plans for water use. Some resource agencies may require demand management, as well as supply management measures.
- **Approval of environmental impact assessment.** Substantial developments may require an environmental impact assessment. Impacts considered include ecological and social systems, and the benefits and costs of the proposed project. In this context, better planning and regional solutions also could be encouraged to address some environmental goals.

State Authority for Revolving Loan Funds

State Financial Assistance Agency

The State financial assistance agency responsible for administering a State revolving fund (SRF) or other grant and loan programs can exert substantial authority to ensure new system capacity. Some States have established independent agencies for this purpose (e.g., PENNVEST in Pennsylvania). The focus of attention in general is financial capacity because of the need to assure the prudent use of grant funds or the timely repayment of loans. The control point for State financial assistance agencies is:

- **Deciding eligibility and approving grants and loans.** Eligibility criteria used by the State financial assistance agencies can incorporate capacity provisions. State financial agencies also can obtain information needed to assess capacity as part of the loan/grant application, review, and approval process.

State Authority for Planning and Growth Management

State Planning or Development Agency

Water systems play a role in the larger context of growth and development. Some States have planning, development, or growth management agencies authorized to promote better planning and growth management strategies. A few States have implemented Statewide regional planning processes for water supply (e.g., Maryland). The control point for State planning and development agencies is:

- **Review and approval of plans.** State planning agencies may be authorized to review development plans that include new water systems.

Regional Planning Councils (Intrastate)

Regional entities exist in some States both as comprehensive planning organizations and as special-purpose water resources planning bodies. In many instances, these bodies do not have significant authority to affect new system development, but they may have effective influence on

the local and county governments within the region. The control point for regional planning councils is:

- Review and approval of plans. Regional planning agencies may be authorized to review development plans that include new water systems.

State Enabling Authority for Local Government

Secretary of State (or Other Agency)

State enabling laws define the powers and responsibilities of local government and can provide local government with an important role in the process. Enabling legislation may affect the formation of a new water system in a variety of contexts. Control points in this area include:

- Authorization of local governments and special districts. Formation of a new local governmental entity, including special districts formed to provide water service, requires State authorization. Some States also have planning statutes of various types that confer special powers to local jurisdictions.
- Subdivision and platting regulations. In many States, subdivision and platting laws define more specifically the powers of local government with respect to approving land development.
- Authorization of funding (debt, bonds). Local governments generally must have State approval to issue debt instruments, such as bonds, which may be needed to fund new system operations.

State Authority for Public Safety

State Fire Marshal (or Other Agency)

The State Fire Marshal or another agency vested with public safety authority may require water systems to meet fire protection standards. Therefore, potential control points at which authority is exercised by the State Fire Marshall are:

- Permits and approvals related to fire protection codes. Water distribution systems for new systems typically should be designed to meet fire protection codes. New systems might be required to submit engineering specifications related to water storage, pressure, fire hydrant locations, and various building codes.

Local Governmental Authority for Land-Use, Planning, and Finances

Municipalities, Counties, and Special Districts

Local governments (municipalities, counties, and special districts) play an important role in the creation of new water systems. Local governments can intervene very early in the conception of new systems. Specific procedures for approval of new development are defined in local ordinances.

Control points where local governments can exercise authority to ensure new system capacity include:

- Subdivision, zoning, and land-use approvals. Developers usually must obtain preliminary and final approval for subdivisions. The preliminary approval process is a more important control point because it usually occurs before the developer has made significant fixed commitments. Active local or county governments require sufficient planning information to evaluate needs for utilities, roads, and other services. Performance bonds also may be required.
- Construction permits and approvals. Local government can exercise some authority through requirements such as building permits.
- Franchise approval. For many utility services, providers must obtain a franchise that defines the service territory and the terms of service. The franchise agreement can be negotiated and conditioned as to various terms.
- Local planning approvals. Capacity-related questions are often raised in the context of local planning processes. The extent to which local authority for planning is exercised can be highly variable. Some States have adopted a strategy of encouraging local water supply planning processes where they are acceptable and developing other means of addressing new systems in other parts of the State (for example, Pennsylvania, North Carolina).
- Authorization of local government financing. A new publicly owned system will require local approval of financing arrangements, such as the issuance of debt instruments.

Federal Rural Utilities Authority

Rural Utilities Service

Like grants and loans from State financial assistance agencies, grants and loans from the federal Rural Utilities Service (formerly the Farmers' Home Administration) are a critical control point where the capacity issue can be addressed.

- Approval of grants and loans. Capacity issues may be embedded with the eligibility criteria and approval processes for grants and loans. Use of grants and loans also may be affected by various provisions and conditions.

Interstate Authority

River Basin Commissions

In a few river basin regions, interstate authority may be relevant to the development of new water systems. For example, the Delaware River Basin Commission has authority comparable to State water resource agencies. Federal interstate compacts, however, carry the force of federal law and thus can preempt the States with respect to certain policies. Interstate institutions and authorities may become more important as the potential for conflict over interstate water resource allocation rises. Control points exercised by river basin commissions include:

- **Basin withdrawal permits.** An interstate commission can require a withdrawal permit from water resources common to more than one State. These permits may be conditioned on a variety of terms.
- **Basin planning and resource management requirements.** An interstate commission also can require supply management planning and practices, as well as demand management to ensure that only necessary withdrawals are permitted.

State Authority to Regulate Related Businesses

Banking Regulators

The States regulate the banking industry, which in turn makes loans to water systems and developers. A control point exercised by banks is:

- **Loan approval.** Loan eligibility and approval process are used to assess the financial capacity of applicants.

Insurance Regulators

The States regulate the insurance industry, which in turn provides insurance to water systems and developers. A control point exercised by insurance companies is:

- **Insurance approval.** Insurance eligibility and approval processes can be used to assess the financial capacity of applicants.

Table 1: Potential Authorities and Control Points for Ensuring the Technical, Managerial, and Financial Capacity of New Water Systems

(a) Statutes include legal authorities, as well as rules, and regulations that carry the force of law.
Boldface type indicates principal approval processes for creating a water system.

A	B	C	D. Capacity Assessed		
Basis of Authority (Statutory or Other)	Agency Vested with Authority	Control Points for Ensuring New System Capacity	Tech- nical	Mana- gerial	Finan- cial
State Authority for Drinking Water Quality (a)	State drinking water primacy agency	Facility plan review and permit			
		Operating permit			
		Operator certification			
		Construction requirements for wells			
		Source water protection plans			
		System planning requirements			
		Certificate of convenience and necessity			
		Approval of system's investments (ratebase)			
State Authority for Economic Regulation of Public Utilities	State public utility commissions (PUCs)	Approval of system's financial structure			
		Approval of initial rates and rate design			
		System planning requirements			

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A	B	C	D. Capacity Assessed		
			Technical	Managerial	Financial
Basis of Authority (Statutory or Other)	Agency Vested with Authority	Control Points for Ensuring New System Capacity			
State Authority for Water Resource Management	State water resource agency	Withdrawal and source development permits			
		Approval of water rights			
		System planning requirements			
		Approval of environmental impact			
State Authority for Revolving Loan Funds	State financial assistance agency	Eligibility and approval of grants and loans			
State Authority for Planning and Growth Management	State planning, growth management, or development agency	Review and approval of plans			
	Regional planning councils (intrastate)	Review and approval of plans			
State Enabling Authority for Local Government	Secretary of State (or other State agency)	Authorization of local governments and districts			
	State financial control agency	Subdivision and platting regulations			
		Authorization of local government financing (public systems)			
State Authority for Public Safety	State fire marshal (or other agency)	Permits and approvals related to fire protection codes			

A	B	C	D. Capacity Assessed		
Basis of Authority (Statutory or Other)	Agency Vested with Authority	Control Points for Ensuring New System Capacity	Tech- nical	Mana- gerial	Finan- cial
Local Governmental Authority for Land-Use, Planning, and Finances	Municipalities, counties, and special districts	Subdivision, zoning, and land-use approvals			
		Construction permits and approvals			
		Franchise approval			
		Local planning approvals			
		Authorization of local government financing			
Federal Rural Utilities Authority	Rural Utilities Service	Approval of grants and loans			
Interstate Authorities and Compacts	River basin commissions	Basin withdrawal permits			
		Basin planning and resource management requirements			
State Authorities to Regulate Related Businesses	Banking regulators	Loan approval by commercial lenders			
	Insurance regulators	Insurance approval by insurers			

(a) Statutes include legal authorities, as well as rules, and regulations that carry the force of law.
Boldface type indicates principal approval processes for creating a water system.

ACTIONS TO ENHANCE OR ENABLE STATE AUTHORITY

This section provides an overview of actions that States can take to establish the necessary authority or other means to ensure new system capacity (if these do not already exist) or to enhance the effectiveness of existing authority.

Ensuring the capacity of new water systems can be facilitated by the use of a two-part approach, represented by two basic and sequential questions:

1. Is authorizing a new water system the "best" option compared with the available alternatives in terms of technical, managerial, and financial capacity, as well as other relevant considerations pursuant to applicable authorities?
2. If creating the new water system is the best option, how can technical, managerial, and financial performance be strengthened and assured for the future?

As discussed below, these questions lead logically to specific actions that States can take to establish or enhance their authority. These actions can be used with several different types of authority and control points. The actions are not mutually exclusive, but mutually reinforcing. The challenge is in designing a comprehensive and coordinated set of actions that best meets each State's institutional arrangements and capacity development needs.

The following actions are described below:

- Expand authority to add, strengthen, or coordinate control points.
- Coordinate agency capacity efforts.
- Enhance system approval processes.
- Promote awareness of capacity issues.
- Encourage interconnection, consolidation, or regionalization.
- Strengthen new system capacity.
- Require guarantees and assurances.

Expand Authority to Add, Strengthen, or Coordinate Control Points

Enact Legislation Regarding Authority or Jurisdiction

Some States may want to evaluate whether existing statutory or other authority provides adequate capability to intervene prior to new system development in order to obtain assurances of technical, managerial, and financial capacity. State authority and the specific control points derived from it can be added, strengthened, or coordinated statutorily for the purpose of ensuring new system capacity. Another potential use of legislation is expanding the jurisdiction of agencies to provide greater coverage. Legislation also can be used to further goals of interagency coordination by specifying when and how agencies will collaborate in joint efforts. Ultimately, in order for the State capacity evaluation to have the desired effect on the front end of the development process, the statute or other authority must be strong enough for the State to say "no."

Issue Rules, Regulations, and/or Policies.

Some States may find that existing statutory authority provides a sufficient basis for developing and clarifying new water system capacity policies through rules, regulations, and/or policy statements. Where adequate statutory authority exists, new elements can be added to application requirements with either amended regulations or, more simply, with revisions to guidance manuals or application forms.

Enhance Capacity Assessment Resources

State agencies must rely on their own capability to implement a capacity development strategy. This may include expanded responsibilities for engineering analysis and financial analysis. Staff may need additional tools and training to conduct business planning and other activities. New staff functions might be created or outsourced. Memoranda of Understanding (MOUs) can address sharing of personnel among agencies. In some States, for example, PUCs perform financial reviews for primacy agencies.

Agency resources devoted to capacity development should translate into future resource savings from avoided capacity problems.

Coordinate Agency Capacity Efforts

Conduct Regular Meetings

A useful approach for coordination that many States use is to conduct regular meetings that include representatives from the different agencies with authority for water systems. These meetings can facilitate informal means of coordination (such as information sharing) and more formal means (such as executive memoranda of understanding). Through regular meetings, agency personnel can craft and implement more effective capacity policies.

Formulate Interagency Policies and MOUs

State agencies can formulate joint policies to direct their capacity development activities. These policy statements convey common goals and activities among agencies. Coordination among State agencies can be greatly enhanced through the development of a formal MOU. MOUs typically include a joint policy statement or statement of objectives, a description of the specific areas where collaboration is envisioned, and the mechanics of the collaboration.

Some of the major mechanical issues addressed in MOUs are: 1) coordinating information required of applicants to avoid duplication, streamlining application requirements, and providing consistency in evaluations by ensuring that the multiple agencies are examining the facts in the same framework; 2) sharing analytical resources and capabilities (e.g., one agency may have engineering capabilities while another has financial capabilities); 3) coordinating decisionmaking to clarify which agency decides first, whether one agency's decision is contingent upon that of another, or whether the multiple agencies need to act concurrently; and 4) describing the protocol

to be employed in monitoring and evaluating the collaboration defined in the MOU and adapting the agreement as needed.

In several States, primacy agencies and public utility commissions have developed MOUs. In some cases, natural resource agencies also have engaged in the development of MOUs. These agreements also could be drafted to include State financial assistance agencies, the RUS, and local governments.

Hold Joint Proceedings and/or Provide Testimony

Regulatory and administrative hearings provide more formal means of coordinating policy actions. Government agencies often have authority to conduct joint hearings among agencies with common missions and interests. This type of authority could be used, for example, to conduct a consolidated approval process among the agencies responsible for water quality, water quantity, and economic regulation.

Another means of procedural coordination is to have personnel in one agency provide testimony at the hearings of another agency.

Share Data and Information Resources

One important barrier to effective review of new water systems is the inaccessibility of relevant information. Economic regulators may have access to key financial information, while primacy agencies may have access to key technical information. Sharing information and developing a holistic picture may be difficult. New information-sharing technologies, including computer mapping, can greatly enhance interagency communications and policymaking.

Clarify State and Local Roles

An important challenge in capacity development is the clarification of State and local roles. While States are responsible for ensuring the capacity of new water systems, many critical control points for creating new systems are at the local level. Well informed and active local governments will both achieve more efficient development practices and reduce the need for State intervention.

Where allowed by State law, the States can, consistent with 1420(a), delegate some of the responsibility for ensuring capacity of new systems to local government, provided that the arrangement is guided by clear written agreements. A key to making local control points effective in assuring capacity is making sure they are coordinated with local approval processes and known and understood by new system applicants.

More generally, improving information flows among State and local governmental bodies would be a positive attribute of a capacity development initiative. State and local governments can share information resources and coordinate various activities, perhaps using field staff of State agencies.

Enhance System Approval Processes

Conduct Preliminary Feasibility Meetings With Applicants

Some States have adopted a practice of encouraging informal pre-feasibility meetings between developers, their engineers, and State plan review and permitting staff. The objective is to talk through alternative approaches for providing service in light of State requirements at the earliest possible phase. Additional control points at the local or county government level include applications for building permits or business licenses.

Develop a Standard Operating Procedure (SOP) for Approvals and Denials

The fragmented approval process for new water systems could be coordinated through the development of a standard operating procedure (SOP) identifying critical authorities and control points, and an optimal sequence of approvals. A SOP could be drafted with input from relevant stakeholders in the State. Memoranda of Understanding could be drafted to recognize the SOP. The SOP could be offered to the counties and municipalities in a State for implementation of local components. Development of a SOP is one way to coordinate State and local activities.

A credible and effective capacity initiative will include denials of permit applications when capacity criteria cannot be met. States may also want to develop a "disapproval" SOP whereby alternatives to creating the new system and implementation steps are recommended to applicants. Denial of an application does not preclude the State from providing the advice or technical assistance necessary to move a new system applicant from "no" to "yes."

Promote Awareness of Capacity Issues

Form a Stakeholder Group

State capacity development efforts, and communications about those efforts, can be greatly enhanced by a formal process for stakeholder involvement. The key groups involved in new system formation are represented in each State by builders associations, realty associations, mobile home park operators associations, county associations, municipal associations, planning associations, consulting engineers associations, water industry groups (AMWA, AWWA, NAWC), consumer advocates, environmental interests, operators associations, and technical assistance providers (NRWA, RCAP). While such organizations do not represent everyone, their communication networks reach a large percentage of the target audience.

Several States have convened an advisory committee or task force consisting of all of the relevant stakeholder groups plus the relevant agencies of State government. Some of these groups have opted to continue to meet regularly in order to monitor and manage the implementation process. Some States have developed a written communications plan to support program implementation. The plan identifies objectives, specifies the individual segments of the target audience, outlines the messages and information to be conveyed to each segment, and itemizes the tactical options for delivering these messages.

Educate New System Applicants

New system applicants may be unfamiliar with State authority for water systems and unaware of capacity development policies. Clear and early communications with new water system applicants, such as property developers, provides an important approach to capacity development.

It is possible to include property developers as partners in ensuring capacity. One of the most important profit/loss issues in development is minimizing uncertainty. At the point where property developers begin to commit significant investment dollars, they need to have some confidence that they will be able to complete the development within a reliably estimable time period. Many developers will trade assurances of capacity for minimizing uncertainty. This process can be made easier as consulting engineers and local officials become aware of the importance of considering capacity in making decisions about development.

Educate Consumers and Communities

Educating consumers and communities can help bring market forces to bear on new system capacity. If home buyers knew what to look for and how to tell a well-conceived and planned community water system, market forces could provide substantial pressure to ensure capacity. State and local governments could provide consumers with information resources, as well as opportunities for public hearings related to key approval processes.

Educate the Technical Community

Property developers may rely on a myriad of technical consultants to design and build infrastructure facilities. Ideally, engineering and other consultants will be made aware of capacity development issues and policies. Consultants can play an especially important role in identifying alternatives to new system capacity.

Educate the Financial Community

New water systems probably will require various supports from the private sector, including the lending and insurance industries. Bankers and insurers can be given a fuller understanding of water system capacity to help avoid potential liabilities. Better informed providers can exert a degree of market power on the water industry to enhance capacity development efforts.

Encourage Interconnection, Consolidation, or Regionalization

Require Consideration of Regional Alternatives

Consideration of regional alternatives can be made a part of the State approval processes. State primacy agencies and PUCs often can require a demonstration that alternatives have been

considered which might provide a more reliable supply for the proposed service area. Regulators sometimes require a new system applicant to demonstrate why the proposed service area cannot be absorbed within a larger system or served by a line extension of reasonable length from a nearby system. Regional options could be considered for all or part of utility operations. Some new systems, for example, might run only distribution facilities and purchase wholesale water from a regional supplier. Others might maintain ownership but contract for operations services with a nearby utility. Washington State's water system plan requirement is one example of a state-sanctioned regional alternative.

Promote Regional Planning

Regional water system planning can ensure capacity by providing more efficient alternatives to serve new real estate developments and by heading off new systems before they are ever conceived. Regional planning can link capacity development to other planning processes and provide opportunities for interaction among local governments. Maryland officials, for example, direct all new development to county planning processes. The States can promote regional planning through grants and other incentives.

Establish an Interconnection Policy

Through policy statements, memoranda of understanding, and other vehicles, State agencies can establish an interconnection policy for guiding approvals and other determinations. A coordinated interconnection policy at the State level requires attention to a variety of existing policies that may or may not be consistent with regionalization goals. These policies, which may differ greatly, include State natural resource agency determinations about water transfers, State public utility commission orders regarding acquisitions by investor-owned utilities, and local annexation policies and practices. Some State regulations provide for serious consideration of interconnection with a nearby system if one exists within a certain distance of a proposed system.

Minimize Bypass Opportunities

Policies vary as to whether customers within an enfranchised service territory must connect to the water system and stay connected, versus self-supply through individual wells. A policy that mandates interconnection, and prohibits opportunities for bypass, can enhance capacity by reducing uncertainty and enlarging the customer base, making it possible to achieve economies of scale. Minimizing bypass also can improve regional environmental management by making it easier to monitor and control withdrawals, supply management, and source protection practices.

Modify Annexation Policies

Local annexation policies and practices may encourage inefficient growth and development practices. State statutory and other policies that guide annexation might be modified to consider implications for new system capacity. The States can work with local government to use annexation practices to promote regional solutions to water utility services.

Strengthen New System Capacity

Require a Comprehensive Business Plan

Requiring new water systems to provide a comprehensive business plan may be one of the most important means of ensuring capacity. Planning requires applicants to demonstrate technical, managerial, and financial capacity. Planning is a diagnostic tool as well as a capacity development tool. Planning can be used to generate more reliable information about costs and other issues needed to make sound decisions about a water system's future.

In a number of instances, States have found that existing statutes and regulations already provide authority for such things as requiring financial data (Colorado, Montana, and North Carolina). Some States have amended statutes and/or regulations to clarify authority to gather and use planning information (California, Connecticut, Iowa, Massachusetts, Montana, Pennsylvania, South Carolina, Virginia, and Washington). Several States have used such authority to develop processes for the evaluation of business plan or water system plan information (Connecticut, North Carolina, Massachusetts, Pennsylvania, South Carolina, Virginia, and Washington). Several States have now produced technical guidance manuals for completing water system plans.

One issue in the implementation of a water system plan approach is the need for review capability at the State level. There are two dimensions to this: engineering analysis and financial analysis. Engineering staff would typically be called upon to evaluate the engineering elements of the water system plan, and additional training may be needed. One clear need is a method for validating cost estimates to be submitted in the plans against standard cost estimating practices and actual operating experience. Some work was initiated in this area with the development of the PAWATER cost model by Pennsylvania and EPA. PAWATER provides a tool for validating cost estimates. Additional tool development is necessary in this area.

In the case of SDWA primacy agencies, the rationale for incorporating business planning into State approval processes is that public health protection, as well as safe, adequate, and reliable service, cannot be assured unless all of these elements are present. From the State PUC perspective, the rationale is that without all the elements of a sound business plan, service reliability and affordability will suffer. From a local government perspective, the elements of the water system plan are essential to assure that new infrastructure is conceived in a sustainable manner, providing a stronger footing for economic development. From the consumer's perspective, it means safe and reliable drinking water in a cost effective manner.

Require a Technical Operations Plan

This approach expands on the use of engineering standards, relying on inherent public health authority to set such standards. This involves such things as well construction standards (Minnesota), requirements for approval of surface water sources for small systems (Missouri), requirements for the frequent presence of a certified operator on the premises (Florida and South Carolina), specific operator certification requirements, requirements for system water rates, and management certification requirements.

A principal benefit of the engineering/operations approach is that it can be implemented with the type of staff already in place in State primacy agencies. The trade-off is that while the level of assurance of technical and managerial capacity is great, the assurance of financial capacity is indirect. In conducting engineering reviews, clear standards are available but the State also has considerable room to exercise judgment if it is not fully satisfied with the adequacy of proposed plans. In most cases, the basis for exercising this judgment is the State's legal authority to protect public health.

Develop Benchmarks or Minimum Standards

Under various authorities, agencies can develop benchmarks or minimum standards for screening proposed systems. For assuring financial capacity, for example, systems may be required to make a minimum per-customer investment or achieve a specified coverage ratio. While standards usually are developed formally, benchmarks often emerge from practical experience. Benchmarks and standards also can be used to monitor system performance over time.

Require Guarantees And Assurances

Provide Performance Guarantees

Performance guarantees provide specific remedies for a system's failure. Guarantees can be required of either the system developer or the local government authorizing the system's creation. Guarantees tend to emphasize financial protection and may take the form of a performance bond, a letter of credit, a guarantee from a parent company or affiliated organization, and an operations contract with a reputable provider that includes performance criteria. Some States require developers of new water systems to establish escrow accounts or reserves (Maryland and Washington).

Ensure Takeover by Another Entity in Case of Failure

Ensuring the takeover of a failed water system should help to guarantee that newly created systems have adequate capacity, while also providing a solution if they do not meet performance expectations. Ensuring a takeover involves appointing a local government or another system as trustee or securing a commitment from the local government to annex, assimilate, or interconnect the system. A road-based assurance approach is to give some unit of sub-state (municipal or county) government responsibility for all water service within its purview. Therefore, if a new system fails, the sub-state unit is required to provide water to the customers served by the failed system.

New Jersey approves only municipal or investor-owned water systems, which forces local government to accept responsibility to provide service for new development unless an investor-owned provider seeks to provide the service. In Connecticut and Washington, a local government issuing approval for a new system prior to the State's viability review can be

designated as the receiver if the system fails. The idea of strengthening capacity in the first place, of course, is to avoid receivership and mandatory takeovers of failed systems.

Table 2: Actions to Establish or Enhance Authority to Ensure the Capacity of New Water Systems

Objectives	Actions
Expand authority to add, strengthen, or coordinate control points	Enact legislation regarding authority or jurisdiction
	Issue rules, regulations, and/or policies
	Enhance capacity assessment resources
Coordinate agency capacity efforts	Conduct regular meetings
	Formulate interagency policies and MOUs
	Hold joint proceedings and/or provide testimony
	Share data and information resources
	Clarify State and local roles
Enhance system approval processes	Conduct preliminary feasibility meetings with applicants
	Develop a protocol for approvals and denials
Promote awareness of capacity issues	Form a stakeholder group
	Educate new system applicants
	Educate consumers and communities
	Educate technical community (consultants)
	Educate financial community (lenders and insurers)
Encourage interconnection, consolidation, or regionalization	Require consideration of regional alternatives
	Promote regional planning
	Establish an interconnection policy
	Minimize bypass opportunities
	Modify annexation policies
Strengthen new system capacity	Require comprehensive business plan
	Require a technical operations plan
	Develop benchmarks or minimum standards
Require guarantees and assurances	Require performance guarantees
	Assure takeover by another entity in case of failure

ENSURING CAPACITY OF NEW NONTRANSIENT, NONCOMMUNITY WATER SYSTEMS

Nontransient, noncommunity water systems (NTNCs) provide service to schools, factories, office/industrial parks, major shopping centers, resort hotels, and other such establishments that may be physically isolated from central water supply systems. Many NTNCs are private, investor-owned establishments; some are publicly owned (e.g., schools). Water service is developed in these instances as an ancillary function. The water system is not the principal business or focus of the organization that is running it.

Because of their unique character, ensuring of capacity in new NTNCs must be approached somewhat differently than the approach taken in community systems. Many elements of the approach are still the same, however. In this section, the major program elements are reviewed in the same order as presented in the preceding three sections. To avoid repetition, this discussion highlights the exceptions, or the places where the approach to new NTNCs needs to be developed differently.

Legal Authority or Other Means

All of the local and county government sources of legal authority discussed for community water systems (CWSs) are relevant also to NTNCs, but NTNCs may become more involved in zoning approval than subdivision approval processes. At the State level, the authority of the State water resources agency and SDWA primacy agency still pertain, but the authority of the State PUC is unlikely to be involved. State authority through a technical operations plan review may be an effective means of ensuring capacity for NTNCs.

Adding the capacity assurance dimension for NTNCs to the traditional authority of State primacy agencies may require the same effort in developing regulations, guidance, or new legislation as for CWSs, depending upon existing statutory language and existing practices.

Control Points in the New System Development Process

Many of the control points relevant to new CWSs do not apply to NTNCs (e.g., home buyers, developers, mortgage lenders), but local government and State agencies (except the PUC) still play an important role in NTNC approval processes. In addition, the local government control point may be less effective with NTNCs than it is with community water systems, leaving greater reliance on the State to ensure capacity.

Actions to Ensure Capacity of New Systems

In ensuring the capacity of new NTNCs, the full range of communication, coordination, and consolidation discussed for CWSs are also relevant to NTNCs. Technical assistance by States, the water industry, and the private sector also can be an effective tool to enhance the process for new system capacity development in NTNCs. However, the methods used for capacity evaluations must be viewed differently because the nature of the service provided by CWSs and NTNCs is different.

The fact that an NTNC is an ancillary service of a larger business or public enterprise could be interpreted to imply a performance guarantee by that larger business or enterprise. There is, in effect, more capacity implicit in the fact that the system will not have to stand on its own financially. Rather than attempt to obtain authority sufficient to probe the finances of private businesses or school districts, a simpler approach would be to formalize the implied guarantee, making it an explicit condition of the approval and stressing to the applicant that performance shortfalls can result in revocation of a permit, shutting the entire facility down. In this context, the State drinking water regulator is no different than the food service inspector, the building code inspector, or the fire marshall. This approach could be coupled with the engineering and operating standards approach to provide a high level of capacity assurance in approving new NTNCs.

CHAPTER 3:

Information for States on Preparing Capacity Development Strategies Under §1420(c)(2) of the Safe Drinking Water Act

INTRODUCTION

Section 1420(c)(2) of the Safe Drinking Water Act (SDWA) Amendments of 1996 (Public Law 104-182) addresses State capacity development strategies to ensure the technical, financial, and managerial capacity of public water systems. A State not developing and implementing a strategy receives only 90 percent of the Drinking Water SRF allotment in Fiscal Year 2001, 85 percent of its allotment in 2002, and 80 percent in each subsequent fiscal year.²

In developing and implementing a capacity development strategy, the Act requires a State to "consider, solicit public comment on, and include as appropriate" five specific elements. These five elements, which are listed in §1420(c)(2)(A-E) of the statute, require the State to consider the following:

- Methods or criteria to prioritize systems [§1420(c)(2)(A)]
- Factors that encourage or impair capacity development [§1420(c)(2)(B)]
- How the State will use the authority and resources of the SDWA [§1420(c)(2)(C)]
- How the State will establish the baseline and measure improvements [§1420(c)(2)(D)]
- Procedures to identify interested persons [§1420(c)(2)(E)]

In addition to considering the elements listed in §1420(c)(2)(A-E) as part of the capacity development strategy, §1420(b) requires States to "prepare, periodically update, and submit to the Administrator a list of community water systems and nontransient, noncommunity water systems that have a history of significant noncompliance and, to the extent practicable, the reasons for noncompliance." States are also required within five years of the date of enactment to "report to the Administrator on the success of enforcement mechanisms and initial capacity development efforts in assisting [those systems] . . . to improve technical, managerial, and financial capacity." The list and the report must be included as part of the State's capacity development strategy for the purposes of the withholding requirements of §1452(a)(1)(G)(I).

A natural extension of the State's task of prioritizing individual water systems in need of improving capacity is to look beyond these individual systems and analyze capacity issues on a regional basis. This would promote the creation of a coordinated capacity development strategy which, through greater economies of scale, could result in more efficient capacity development State-wide.

This document identifies some of the tools and resources that States could use to address elements A through E. To best assist the States in choosing tools, the discussion in this information document will highlight some of the ways in which the five elements can be valuable for carrying out other parts of the drinking water program. When relevant, this document will offer some options for assembling the tools to form a functioning strategy.

Because of the nature of the five elements, it is likely that the tools and strategies employed by States will vary. For this reason, the document discusses separately each of the five elements of a capacity development program. In addition to discussing the tools and examples of their

² See EPA, Office of Water, *Drinking Water State Revolving Fund Program Guidelines* (EPA 816-R-97-005, February 1997).

uses, Appendix A provides a list of resources where a State can obtain more information on the tools.

Capacity Development—A Broader Perspective

Like source water protection and operator certification, capacity development introduces an extraordinary new focus on prevention and sustainability. Capacity development seeks to prevent compliance problems and associated health risks by ensuring that public water systems have the capability to provide safe drinking water now and into the future.

With its focus on prevention, capacity development also offers many new regulatory flexibilities under the 1996 SDWA. The success of any State capacity development effort will hinge on how a State chooses to capitalize on this new flexibility. Therefore, this prevention approach has two key elements:

- 1) A clear State lead, with flexibility and resources to achieve results. This is necessary because prevention is ultimately about land use and water management, which are State and local issues.
- 2) A strong effort to provide information to the public and involve stakeholders in the decision-making process. A consistent theme in the new law is that States have both new flexibility and resources to tailor programs to State needs and conditions, especially in prevention, and the obligation to provide public information and involvement to ensure that States' choices respond to their constituents' needs and conditions.

Under the 1996 SDWA, capacity development seeks to improve a public water system's ability to meet the challenging tasks of the SDWA by requiring States to ensure technical, managerial, and financial capacity in water systems, and to create capacity development strategies for existing systems to ensure future compliance. These strategies are intended to enhance the technical, financial, and managerial capability of public water systems to deliver safe drinking water. Chapter 1 of this document provides a thorough discussion of the definitions of technical, managerial, and financial capacity.

The tools and approaches that States develop as part of their capacity development strategy will help them make implementation of demanding and complex parts of the law more workable, consistent, and effective. For example, the Amendments' variance and exemption provisions require States to evaluate the affordability of restructuring and water supply alternatives for the systems that apply. In making these evaluations, States can use the information and analytic methodologies for source water management and water system management, both of which they can build in framing their capacity development strategies. These tools will also help evaluate problems of system non-compliance and target technical assistance to systems most in need of help.

Building a Strategy

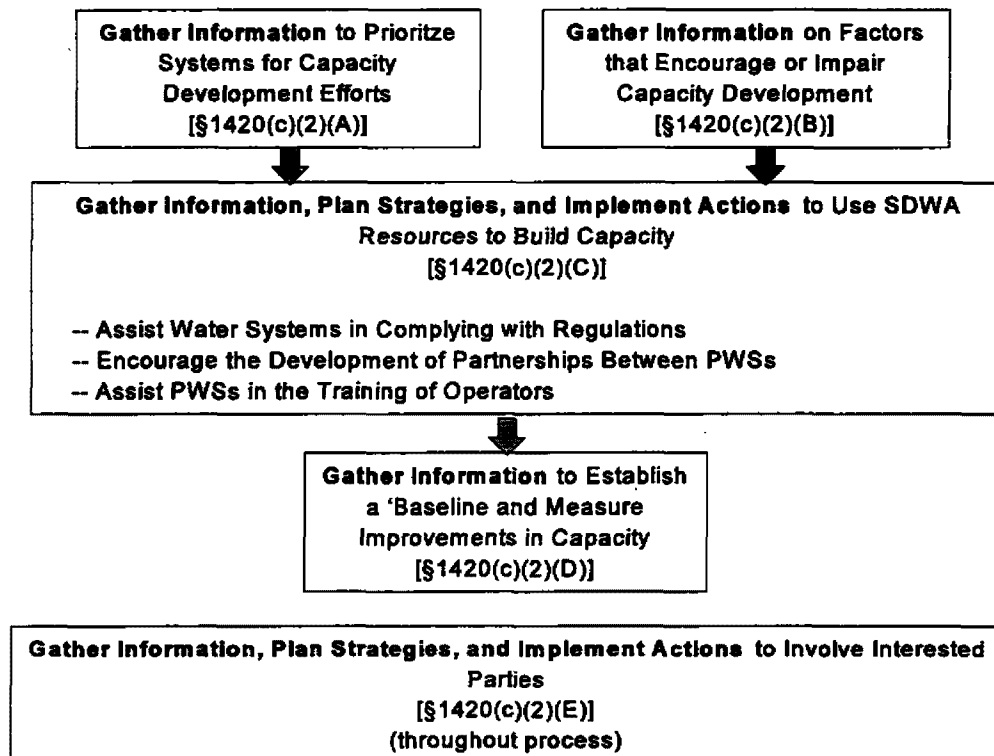
As noted in the previous sections, the Amendments say that each State must consider, solicit public comment on, and include as appropriate five potential elements of a capacity development strategies:

- **Methods or criteria to prioritize systems.** [§1420(c)(2)(A)] This refers to methods or criteria that could be used to identify and prioritize public water systems most in need of improving technical, managerial, and financial capacity. Section 1 provides examples of tools that could be used by States to address this element. Appendix A provides descriptions of these tools.
- **Factors that encourage or impair capacity development.** [§1420(c)(2)(B)] This element refers to the “institutional, regulatory, financial, tax, or legal factors” at the federal, State, or local level that encourage or impair capacity development in water systems. Section 2 offers a discussion of potential factors that could impact capacity development efforts and refers States to work previously completed on this issue.
- **How the State will use the authority and resources of the SDWA.** [§1420(c)(2)(C)] For this element, States should describe how they will use the authority and resources of the SDWA or other means to: 1) assist public water systems in complying with national primary drinking water standards; 2) encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity; and, 3) assist public water systems in the training and certification of operators. Section 3 discusses the tools that could be used by States to accomplish these goals. Appendix A provides descriptions of the tools.
- **How the State will establish the baseline and measure improvements.** [§1420(c)(2)(D)] This element asks States to provide a description of how the State will establish a baseline and measure improvements in capacity in their State. This element provides the tools that State primacy agencies must have to produce and submit a report to their Governors on the efficacy of their capacity development strategy and progress made toward improving the technical, managerial, and financial capacity of public water systems in their State. Section 4 discusses tools that could be used by States to establish a baseline and measure improvement. Appendix A provides descriptions of the tools.
- **Procedures to identify interested persons.** [§1420(c)(2)(E)] This element asks States to describe stakeholders that have an interest in or are involved in the preparation and implementation of the capacity development strategy. Section 5 provides examples of interested parties and discusses tools for identifying additional stakeholders.

Exhibit 1 shows how these five elements lay out a comprehensive capacity development strategy that consists roughly of four steps:

- Information collection and analysis (e.g. prioritizing systems needing improvement, [Element A] and identifying and addressing factors that encourage or impair capacity [Element B]).
- Planning for implementation (e.g. using SDWA resources to *plan* strategies to help systems with compliance or encourage partnerships [the planning aspects of Element C]).
- Implementation actions (e.g. using SDWA resources to *implement* strategies to help systems with compliance or encourage partnerships [the implementation aspects of C]).
- Collecting and evaluating information for feedback on capacity development strategies (e.g. establishing a baseline and evaluating improvements [Element D]).
- Throughout each of these steps, States are encouraged to identify and involve stakeholders [Element E]).

Exhibit 1
Building a Capacity Development Strategy
(Information Gathering, Planning, and Action)



Relationship Between Tools and the Five Elements of a Capacity Development Strategy

While the Act requires that a State consider each of the five elements in its capacity development strategy, it does not require the State to use specific tools. Each State is unique. Some States have access to many of the tools described above, while others have access to only a few. In addition, these tools are used differently in each State.

Systems are unique, too. A tool that is useful in one State for developing capacity for privately owned, ancillary systems may be different from the tools to develop capacity in municipal systems.

The matrix on the following page provides a framework for reviewing the applicability of each tool to preparing a capacity development strategy. The cells in the matrix have been left blank, to be used by the States as a means of shaping their strategy given their unique situation. The tools and examples of their use are described in detail in Appendix A.

Exhibit 2
Tools and Resources for Developing State Capacity Programs

Tools	A Methods or criteria to prioritize systems	B Factors that encourage or impair capacity development	C (How will the State use the authority and resources of the SDWA to?)			D How the State will establish the baseline and measure improvements	E Procedures to identify interested persons
			Assist PWSs in Complying With Regulations	Encourage the development of partnerships between PWSs	Assist PWSs in the training of operators		
Compliance data							
Sanitary surveys							
Water system plan or business plan							
Self-assessment and peer reviews							
The "Dozen Questions" Approach							
Regional plans							
Operator certification							
Permitting requirements							
Capital Improvements plans							
Comprehensive performance evaluations							
Statewide studies of water quality or quantity							
SRF loan applications							
SRF loans							
Simplified budgeting worksheets							
Annual financial reports							
Memoranda of understanding with PUCs							
Cooperation of industry groups, lenders							
Public education and information							
Rate reviews and approvals							
Cooperation with non-governmental orgs.							
Big brother and buddy system programs							
Restructuring							
Training and technical assistance							
Coordination with other agencies							
Source water assessments programs							
Water conservation plants							
Emergency response plans							
Certificates of Convenience and Necessity							
Review of audit report							
Bond issue reviews							
Satellite management							
Consumer Confidence Reports							
Enforcement							
State or Federal surveys of infrastructure needs							

ELEMENT A: METHODS OR CRITERIA TO PRIORITIZE SYSTEMS

There are a variety of methods or criteria that might be used to identify and prioritize systems most in need of improving technical, managerial, and financial capacity. In many cases, a combination of tools could be used effectively in collecting the information needed to prioritize systems. As a State develops its own method, it may want to consider the following:

- Do the State's methods or criteria for prioritizing systems allow it to consider all systems in the State? (Compliance data review would meet these criteria. Tools such as sanitary surveys or simplified budgeting worksheets would meet these criteria if required of all systems over a certain period of time.)
- Do the methods or criteria for prioritizing systems provide the State with a ranking scheme? (Some of the tools discussed below provide an obvious ranking scheme. For example, States could prioritize systems currently in significant noncompliance. In other cases, States must adopt a ranking scheme that fits the tool available.)
- Are the methods or criteria for prioritizing systems easy to implement? (States should consider the resources required to develop the prioritization scheme relative to the resources required to implement its capacity development strategy.)
- What are the data requirements of the prioritization procedure? Does the State have an existing database, can an existing database be modified, or can a new data system be developed, given available resources? (It would be helpful to develop a careful analysis plan for any new prioritization database, so that one can be assured of easy maintenance, user-friendly data retrieval, and, most important, the availability of the correct data. A State might also coordinate its data needs with other, similar data needs, such as a State disadvantaged-community program.)

Examples of States that have systems in place for identifying and prioritizing systems in need of capacity development include Washington and Massachusetts:

Washington State has developed a system to track performance of all systems in terms of their compliance histories, their water system plans, and the financial viability component of their water system plans. Systems are classified according to their compliance and capacity. A color coding system is used; systems classified as "green" have adequate capacity and compliance histories; systems coded as "red" have inadequate capacity and/or compliance histories.

Massachusetts has developed a program for "viability assessment and assurance" for all community water systems and nontransient noncommunity systems serving fewer than 1,000 persons. The program begins with a Comprehensive Compliance Evaluation (CCE) Sanitary Survey, and all systems will be surveyed at least once every six years. Depending on the results of the CCE, systems may be referred to a Mobilization Partner for viability assessment and technical assistance.

The following table lists some tools that States might use in developing a method or criteria for prioritizing systems. The table is meant only as a starting point—States may be able to take advantage of other tools to help prioritize systems. A full description of each tool and examples of its uses are provided in Appendix A.

**Methods or Criteria to Prioritize Systems
Potential Tools**

Tool
Sanitary Surveys
Compliance Data
Water System Plans or Business Plans
Self-Assessments/Peer Reviews
SRF Loan Applications
State or Federal Infrastructure Needs Surveys
Comprehensive Performance Evaluations (CPE)
Operator Certification
Annual Financial Reports
Capital Improvement Plans
Permitting Requirements
Statewide Studies of Water Quality or Quantity
Source Water Assessment Programs
Consumer confidence reports

ELEMENT B: FACTORS THAT ENCOURAGE OR IMPAIR CAPACITY DEVELOPMENT

The statute asks States to consider developing a description of the "institutional, regulatory, financial, tax, or legal factors at the Federal, State, or local level that encourage or impair capacity development." The broad categories of factors included make this description potentially quite comprehensive for each State. Examples of factors that impair capacity development include:

- The State does not have the legal (or regulatory) authority to develop and implement a capacity development strategy.
- There are institutional barriers to developing a capacity development strategy.
- Legal and financial issues associated with water rights are a barrier to developing a capacity development strategy.
- Federal tax law poses some barriers to capacity development—e.g., limitations imposed on the use of tax-exempt bond proceeds for private activities.
- State and local governments cannot afford to implement a capacity development strategy.
- There is a lack of reciprocity for operator certification.
- Systems are unable to obtain variances or exemptions reasonably.
- State statutes or regulations hinder consolidation, regionalization, and interconnection.

The 1996 Amendments add regulatory flexibilities such as more streamlined provisions for variances and exemptions, as well as DWSRF resources to help states overcome some of these barriers.

Examples of factors that encourage capacity development include:

- Statewide growth management legislation encourages capacity development by checking the unrestricted growth of poorly-planned water systems. Any statewide planning statute has similar beneficial effects.
- Statutes on privatization or procurement allow systems to contract for operations and maintenance or other services more easily.
- Statutes on mergers and acquisitions make consolidation more attractive by allowing adjustments to the rate base.
- Statutes that require renewable operating permits for water systems, Certificates of Convenience and Necessity, or periodic sanitary surveys encourage capacity development by enabling the State to assess capacity periodically.

One type of document that could be of assistance is State reports to legislatures on the subject of capacity development. Many of these reports include discussions of the factors that encourage or impair capacity development. Examples are reports by Washington, Connecticut, California, and Pennsylvania. While each State's report will have some aspects that are unique to that State, the process that was followed—including issues that were discussed—should be helpful to other States that are considering these issues.

Another type of product is reports of stakeholders' workgroup deliberations as States prepare capacity development plans. Examples of these include reports from North Carolina and South Carolina.

The following table describes institutional factors (tools) in many State programs that can impair or encourage capacity development. This table is meant only as a starting point as States build their capacity development strategies. States are likely to find other institutional factors (tools) that encourage or impair capacity. The tools and examples of their use are described in Appendix A.

**Factors that Encourage Capacity Development:
Potential Institutional Factors (Tools)**

Tool
Sanitary surveys
Water system plan or business plan
SRF loan applications
Training and technical assistance
Regional plans
Memoranda of Understanding with PUCs
Operator Certification
Permitting requirements
Capital improvement plans
Comprehensive performance evaluations
Coordination with other agencies
Cooperation with non-governmental organizations
Restructuring
Satellite management agency
Rate reviews and approvals
Consumer confidence reports
Source water assessment programs
Water conservation plans

ELEMENT C: A DESCRIPTION OF HOW THE STATE WILL USE THE AUTHORITY AND RESOURCES OF THE SDWA

Under §1420(c)(2)(C), States must describe how they will utilize the authority and resources of the SDWA to improve capacity in public water systems. Specifically, the State is asked to describe how it will accomplish three goals central to a sound capacity development strategy:

- Assist public water systems in complying with national primary drinking water regulations,
- Encourage the development of partnerships between public water systems to enhance the technical, managerial, and financial capacity of the systems, and
- Assist public water systems in the training and certification of operators.

This is the core element of the capacity development strategy, in which the State describes how it will use the new resources—financial and programmatic—of the 1996 SDWA Amendments, and any other statutory or programmatic means, to help water systems deliver safe drinking water reliably. This element encompasses a wide variety of joint, cooperative, or coordinated activities meant to provide assistance to individual water systems and build partnerships among systems.

The activities set forth in Element C are at the heart of the linkages between capacity development and other parts of the law. Not only are the authority and resources in other parts of the SDWA—and the "other means" that may be available in other State and federal programs—vital to developing capacity; the development of greater system capacity through compliance, including technical assistance and multi-system partnerships, is essential for other important parts of SDWA to work.

For example, variances and exemptions are key parts of the new flexibility for small systems in recognition of their limited resources. Before States can give variances or exemptions, the new law requires them to evaluate whether restructuring and water supply alternatives are affordable for the water systems to enable them to comply with a standard. Because both of these alternatives include, by definition, multi-system partnerships, the State's database and methodology for analyzing that data will need to look well beyond the options that lie in the reach of the individual system seeking a variance or exemption.

Because this information has not been required for the drinking water program in the past, many States may not have the database or analytic capabilities to perform these needed functions. But through the opportunity to formulate a capacity development strategy and use new resources from the DWSRF, the new SDWA also offers States the means to assemble this database and workable analytic methodologies that will help them make these decisions.

A State drinking water program should, in formulating its capacity development strategy, locate and learn about the characteristics (including limitations) of these data sources, and to prepare itself to apply these data to assess water supply alternatives for small system variance and exemption applicants. The source water assessments required of States under SDWA Section 1453 (also funded through the DWSRF) can be an important means to assemble

information for water sources currently used by public water systems. States should, to the extent practicable, design their assessments with this use in mind—or capacity development strategies and State decision-making needs on variances, exemptions, technical assistance, and compliance options.

If States apply their DWSRF resources for SDWA's "prevention" activities—especially capacity development and source water protection—in this manner, they may be able to apply their DWSRF set-aside funding for capacity to develop management tools that can offer substantially more effective help and options to small systems. Advances in computing technology have led to powerful (and widely available) analytic tools for solving complex water resource problems. These tools operate on the principle that substantial efficiencies can be gained through better integrated management of water resources and massive "sunk cost" investments in water infrastructure. They have demonstrated their potential to solve difficult supply conflicts in every region of the country, within the constraints of existing systems of water rights and independence of individual water systems. In other words, they do not require changes in water rights or consolidation of systems for their success or effectiveness.

Many tools could be used by States to assist public water systems in complying with national primary drinking water standards, to encourage the development of partnerships between public water systems in order to enhance technical, managerial, and financial capacity, and to assist public water systems in the training and certification of operators. These tools fall into roughly three categories: (1) information collection and analysis; (2) planning for implementation; and (3) implementation actions. Having appropriate tools from each of these categories is essential for a strategy that expends public funds on capacity-building activities efficiently and promotes the greater effectiveness of the State's entire drinking water program to improve drinking water safety. In addition, certain tools act to address systems individually (e.g., with prioritization or technical assistance efforts) or in appropriate groups (e.g., by encouraging partnerships). The discussion of individual tools will highlight those that address individual systems, and those that may be used as building blocks in order to assess system information and develop options for multi-system partnerships. The following table identifies many of the tools that could be used by States. Complete descriptions of these tools and examples of their uses can be found in Appendix A.

**How the State Will Use the Authority
and Resources of the SDWA**

Tool
Training and Technical Assistance
Sanitary Surveys
Compliance Data
Self-Assessments and Peer Reviews
Water System Plan or Business Plan
Comprehensive performance evaluations
Regional plans
Memoranda of Understanding with PUCs
Operator certification
Capital improvement plans
Coordination with other agencies
Rate reviews and approvals
Permitting requirements
Statewide Studies of Water Quality or Quantity
SRF loan applications
Cooperation of Industry Groups, Lenders
Public Education and Information
Cooperation with non-governmental organizations
Big Brother and Buddy System Programs
Restructuring
Satellite management
Emergency Response Plans
Certificates of Convenience and Necessity
Water conservation plans
Review of Audit Reports
Bond Issue Reviews
Enforcement

ELEMENT D: ESTABLISHING A BASELINE AND MEASURING IMPROVEMENTS

The purpose of this element is to encourage States to "establish a baseline and measure improvements in capacity with respect to national primary drinking water regulations and State drinking water law." This element is crucial to completing State responsibilities under §1420(b)(2) and §1420(c)(3). The first provision requires State reports to the Administrator; the second requires State reports to the Governors. As part of both reports, States must provide an evaluation of the success of their capacity development efforts.

As States measure improvements in capacity, they need to understand that capacity building is an incremental process. In some cases, it may take years before changes result in measurable improvements in capacity.

Several approaches can be considered.

- **Volume of outreach activity (sanitary surveys conducted, CPEs conducted, technical assistance provided).** A State could assess its program on the basis of its effectiveness in reaching water systems. This could include the number of sanitary surveys conducted, the number of CPEs conducted, or the number of systems receiving technical assistance. In order to make this more than a bean-counting exercise, however, States would need to ensure that the quality of its outreach was helping systems achieve and maintain capacity.
- **Completion of Water System Plans or Self-Assessments.** A State could also assess its program on the basis of its effectiveness in encouraging systems to complete water system plans or self-assessments. But again, the State would need to ensure that the water system plans or self-assessments and any related technical assistance helped systems achieve and maintain capacity.
- **Operator certification.** States could identify the number of systems with certified operators and the number of operators receiving the training necessary to improve the capacity of the systems they operate.
- **States could use the results of water system self-assessments, water system plans, "Dozen Questions" approach, annual financial reports, or simplified budgeting worksheets to measure "improvements in capacity."** This process would require a baseline measure of all systems at the time when the capacity development efforts began, and a method to update system assessments on a regular basis.
- **Compliance data.** Since the statute explicitly mentions capacity "with respect to national primary drinking water regulations," information on compliance trends could be useful. A State could use compliance data to measure improvements in capacity. The "baseline" would be compliance records as of the calendar quarter when the capacity development efforts began. If compliance data were used, variables such as number of systems in significant noncompliance, number of exceedences, number of M/R violations, and time required to achieve compliance would be candidate measures.

In some cases, however, measuring improvements solely on the basis of compliance might yield an analytical framework that is too limited. Outside factors such as new regulations or new

enforcement tools could influence compliance rates. In addition, trends in compliance data may not yield sufficient data over the short term because capacity development is an incremental, long-term process.

ELEMENT E: IDENTIFYING INTERESTED PERSONS

The purpose of this final element is to identify "persons that have an interest in and are involved in the development and implementation of the capacity development strategy." The overall purpose of identifying and involving interested persons is to inform multiple parties that interact with water systems so they will be better able to contribute to capacity assurance in their actions.

One approach for a State to use in identifying interested parties is to use resources available for other, related outreach programs. Groups of interested persons may include:

- **Advisory panels for new system development.** Foremost among the methods for informing key target groups within a State is the creation of a formal stakeholder involvement process in the development of a new system capacity assurance program. Such panels should include governmental organizations as well as community-based organizations, many of which work in rural areas on community, economic development, and housing development issues. States could take advantage of such a panel to disseminate information on existing system capacity. The key groups involved in new system formation are well represented in each State. While such organizations do not represent everyone, their communication networks do reach a large proportion of the target audience. Such organizations include:
 - Builders' associations
 - Realtors' associations
 - Mobile home park operators' associations
 - County associations
 - Municipal associations
 - Planners' associations
 - Consulting engineers' associations
 - Associations of utilities (AWWA, NAWC, NRWA)
 - Consumer advocates
 - Environmental interests
 - Operators associations
 - Technical assistance providers (NRWA, RCAP)
 - Community action agencies
 - Community development corporations
 - Homeowners' associations.
 - Chambers of Commerce
 - Regulated community
 - Citizens who have registered an interest
 - Bankers and lenders.
- **Operator Certification Advisory Boards.** For those States that have them, operator certification advisory boards can be key resources in disseminating information to help with capacity issues. States might work with operator certification boards to develop a curriculum that would help ensure capacity.

Tools that may identify additional stakeholders include:

- **Regional plans.** Regional planning can serve to promote communication and information sharing between water systems located within the geographic boundaries of the planning area. In Washington State, the regional planning document explicitly specifies the types of support that large systems will provide to assist smaller systems within the jurisdiction of the plan. The support system created by the plan is a formal agreement whereby a large or central utility in a county performs direct, contract, or support services for smaller utilities.
- **Memoranda of Understanding with Public Utility Commissions.** Some State PUCs are involved in regulating public water districts or authorities and even municipal water systems, in some cases. PUC approvals also may be required for extensions of service from existing investor owned systems to new developments outside the original franchise area, or from municipal water systems to new developments outside the municipal boundaries. The statutory authority for the PUCs' actions are defined in their governing statutes that broadly empower them to promote the general public interest by regulating the manner in which monopoly services are provided to assure safe and reliable service at reasonable cost.

These statutory authorities make PUCs logical partners in capacity development strategies. Several state commissions have adopted more expanded roles in small water system capacity by means of: 1) opening a formal proceeding on the matter and requesting public comment (New York); 2) developing and issuing a new policy statement adopted by the commissioners (California, Connecticut); and 3) entering into Memoranda of Understanding with other agencies stating the broad objectives of small system capacity development and itemizing specific commission responsibilities (Connecticut, Pennsylvania, North Carolina).

- **Permitting requirements.** The permitting process alerts permittees to the capacity development process and helps the State identify affected stakeholders.
- **Cooperation of Industry Groups, Lenders, and Non-governmental Organizations.** Developing relationships with these important groups helps ensure their participation in the capacity development process.
- **Public Education.** Public education plays an essential role in identifying interested persons by informing the public of the issue and the opportunity to participate. In addition, public education empowers the general public to participate as an informed party in the preparation of the capacity development strategy.
- **Coordination with Other Agencies.** Coordinating with all involved agencies helps ensure that the capacity development process runs smoothly across all agencies. This is particularly important in those States where the primacy agency is not the only agency participant in the SRF process.

NONCOMMUNITY WATER SYSTEMS

Noncommunity water systems (NCWSs) are stand-alone public water systems located in entities like schools, day care centers, factories, offices, and highway rest stops. NCWSs that serve nontransient populations (e.g., schools and offices where the same people are served each day) are called nontransient noncommunity water systems (NTNCWSs). NCWSs that serve transient populations (e.g., highway rest stops) are called transient noncommunity water systems (TNCWSs). Unlike community water systems, most of these NCWSs were not designed specifically to serve water to the public. Instead, water service is an ancillary function that is not the principal business or focus of the organization.

Unlike community water systems, NCWSs generally do not charge for their water. Instead, the cost of operating the system is built into the cost of their product or service (if the system is a business), or is part of the cost of public services (in the case of public schools).

Because of their unique characteristics, a capacity development strategy for NCWSs must be approached somewhat differently than the approach taken in most community systems. Many elements of the approach are still the same, however. Indeed, it is likely that many of the strategies that apply to NCWSs also apply to ancillary community water systems, such as mobile home parks.

In this section, the major program elements are reviewed in the same order as presented in the preceding five sections. To avoid repetition, this discussion highlights the exceptions—the places where the approach to new NCWSs needs to be developed differently.

Methods or criteria to prioritize systems

Many of the tools that are discussed for CWSs could also be used for NCWSs. For example, States are likely to have information that could be used for prioritization of NCWSs from permit applications, compliance data, or sanitary surveys (since these types of data collection generally apply to both NCWSs and CWSs). NCWSs are less likely, however, to employ tools such as water supply plans and capital improvement plans. In addition, only non-profit NCWSs are eligible to apply for DWSRF funding. Finally, because many are privately owned, they may also resist disclosing financial data.

Factors that encourage or impair capacity development

Many of the factors that impair or encourage capacity development for CWSs also are likely to apply to NCWSs. Operator certification may be less relevant for NCWSs in many States because the requirement to have access to a certified operator may not extend to NCWSs. Dedicating resources for training and technical assistance may be an important step that will encourage capacity in NCWs.

In some States, regulatory, statutory, or policy requirements that encourage capacity may not apply to NCWSs. States should recognize these limitations when they meet Element B of their capacity development strategies.

How will the State use the authority and resources of the SDWA

States can use the programmatic and funding resources of the SDWA to help NCWSs, as well as CWSs, achieve compliance, build partnerships, and have access to trained operators. In some cases, States will want to work with individual NCWSs. In other cases, partnerships between CWSs and NCWSs may be appropriate.

States should recognize some of the limitations of the SDWA with regards to NCWSs. For example, consumer confidence reports will be required only from CWSs and the operator certification requirements will apply only to CWSs and NTNCWSs, but not TNCWSs. However, the Act's important source water protection provisions apply to both NCWSs and CWSs.

How the State will establish a baseline and measure improvements

Assuming that the States may rely most heavily on traditional data sources to establish their baselines and measure improvements, States are likely to have data on both CWSs and NCWSs. Data sources such as compliance data, sanitary surveys, and permit applications are likely to have information on all public water systems.

There is one difference between data collected on CWSs and that collected on NCWSs: States collect information on NCWSs less frequently than CWSs. Assuming that improvement in capacity for all systems will be an incremental process, and assuming that data collected from NCWSs occurs infrequently, it may be more difficult to measure improvements in NCWSs.

Another characteristic of NCWSs is that ownership may change frequently, particularly for small businesses that provide water as an ancillary function. This may make it more difficult for States to measure improvement in these systems.

Procedures to identify persons that have an interest in and are involved in the development and implementation of the strategy

The State should identify representatives of NCWSs and of the communities served by NCWSs to participate in the preparation of the State capacity development strategy. These stakeholders can be identified using the tools discussed in Section 5.

States have been trying to conduct outreach to NCWSs for many years, and some States have perfected methods for doing so. One important step will be to identify some of the largest categories of NCWSs—e.g., public schools, day care centers, offices, factories, and so forth. Interest groups representing these various types of entities can be helpful vehicles for conducting outreach and identifying interested persons.

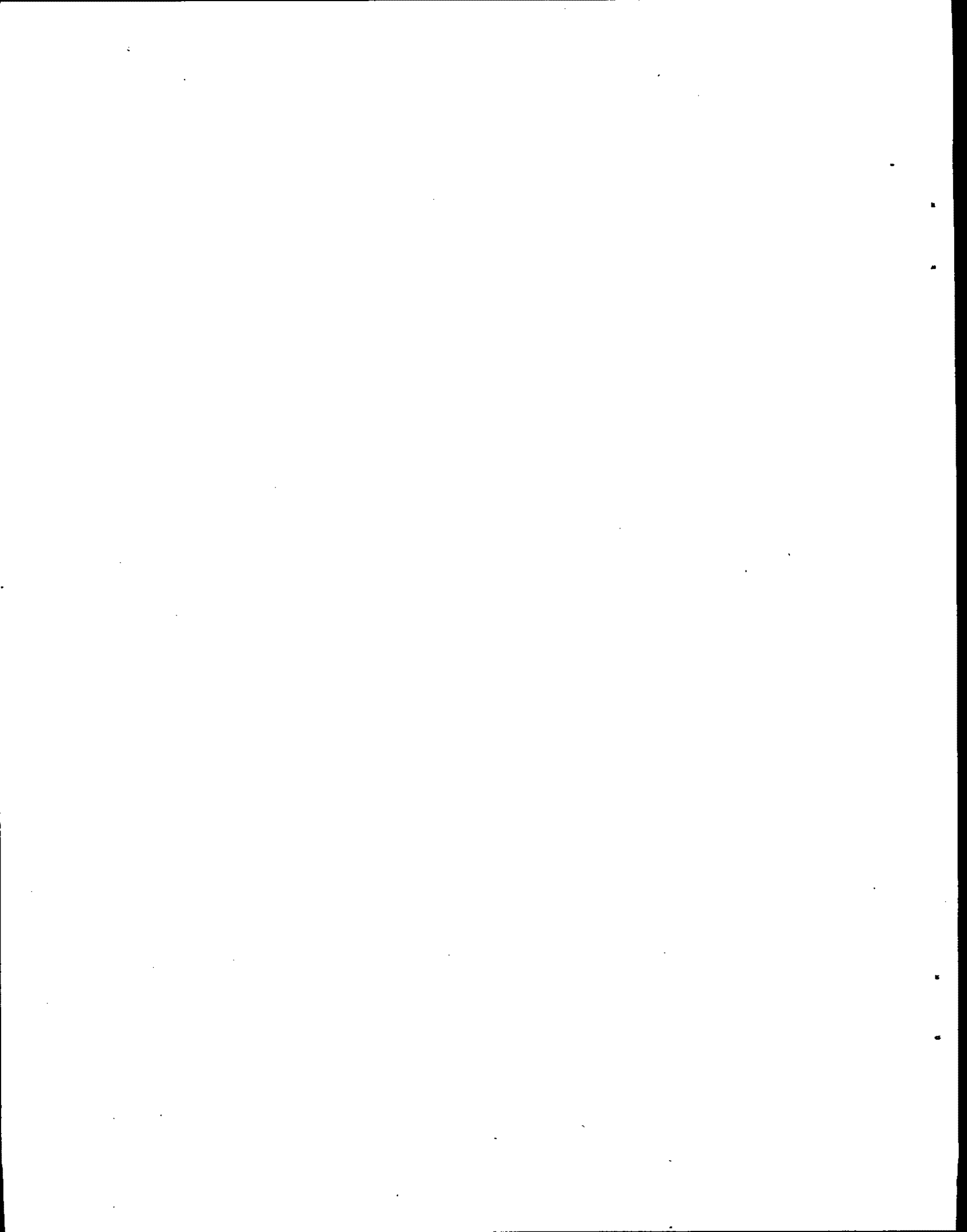
Some States feel that it is difficult to reach the public associated with transient noncommunity systems. Yet, there are many organizations representing the public most affected by water quality at these systems. For example, consider highway rest stops. The American Automobile Association, a large mass-membership organization, has an interest in water quality on the highways. Similarly, organizations representing the tourism industry have a keen interest in

avoiding outbreaks of acute waterborne illnesses. In States like Colorado, Florida, and California, which rely heavily on tourism, the tourism industry has mobilized public attention on water quality in highway rest stops.

The statute recognizes not only persons with an interest in the strategy, but also those who will be involved in implementation of the strategy. This is useful because some drinking water regulators may need to coordinate with other agencies, particularly for NCWSs. For example, for transient noncommunity systems such as food, beverage, and lodging establishments, the drinking water regulators may need to work closely with other State agencies that license these establishments. A memorandum of understanding with the licensing authority may substantially enhance the likelihood that a capacity development strategy will work.

CHAPTER 4:

Information for States on Assessment of System Capacity



INTRODUCTION

Section 1452(a)(3) of the Safe Drinking Water Act (SDWA) Amendments of 1996 (Public Law 104-182) establishes that no assistance from the Drinking Water SRF shall be provided to a public water system that "does not have the technical, managerial, and financial capability to ensure compliance with the requirements of this title" or is in significant noncompliance with a national primary drinking water regulation or variance. Section 1452(a)(3) further specifies that a system without adequate capacity or in significant noncompliance *may* receive SRF assistance if the following provisions are met:

- For those systems that are in significant noncompliance, the use of the assistance ensures compliance;
- For those systems without adequate capacity, "the owner or operator of the system agrees to undertake feasible and appropriate changes in operations (including ownership, management, accounting, rules, maintenance, consolidation, alternative water supply, or other procedures) if the State determines that the measures are necessary to ensure that the system has the technical, managerial, and financial capability to comply with the requirements of this title over the long term."

Specifically, States are required to address the following question:

Which systems lack technical, managerial, and financial capability, thereby rendering them ineligible for SRF assistance (under §1452(a)(3))?

This chapter identifies the tools and resources that States might use to fulfill the capacity assessment requirement under §1452 (a) (3).

METHODS OF ASSESSING CAPACITY

The Drinking Water SRF is a lending operation. Therefore, discussions of capacity that relate to the SRF should keep in mind the perspective that a lender brings to lending decisions. First, a lender must be convinced that the borrower has the financial capacity to repay the loan. Second, the lender expects assurance that the borrower has the technical, managerial, and financial capacity to maintain the system over the life of the loan. This requires a comprehensive view of capacity, with an emphasis on financial capacity.

States have known for some time that among the water systems they regulate there are systems which appear to lack adequate capacity to supply safe drinking water. Inadequate capacity may manifest itself in many ways, but the most serious is persistent noncompliance with State or federal drinking water regulations.

There are many causes of inadequate capacity. Common themes, however, do emerge from State program experiences. Some systems suffer from the cumulative burden of years of neglect and under-investment. Others are faced with fundamental institutional weaknesses (e.g., lack of

a financial plan or lack of a trained operator). When neglect is combined with institutional problems, a system faces an enormous task when making incremental improvements to comply with new State or federal drinking water regulations, or when faced with loan repayment.

The SDWA does not define "technical, managerial, and financial capability." In Chapter 1 of this document, however, we have provided some working definitions of these terms. These definitions may help States think about what is generally meant by the term "capacity".

Tools for Assessing Capacity

There are several tools that might be helpful for assessing a system's technical, managerial, and financial capacity. These include:

- Compliance data
- Sanitary surveys
- Water system plans or business plans
- Self-assessment/peer reviews
- Regional plans
- Criteria used by lenders
- Financial viability assessment methods
- Operator certification
- Financial and managerial training
- Permit application data
- Capital improvement plans
- Comprehensive performance evaluation
- Consumer complaint records.
- State-wide studies of water quality or quantity
- SRF loan application
- Budgeting worksheets
- Annual financial reports
- Source water assessment programs
- Water conservation plans
- Emergency response plans
- Certificates of Convenience and Necessity (CCN)

- Review of audit report
- Bond issue reviews
- Rate reviews and approvals
- Credit rating services
- Financial assurance mechanisms
- Consumer confidence reports
- Interviews with personnel familiar with the system.

Relationship Between Available Tools and the Elements of Capacity

It is impossible to draw firm conclusions about which tool is most appropriate for evaluating which element of capacity. Each State is unique. Some States have access to many of the tools described above, while others have access to only a few. In addition, these tools are used differently in each States. States' abilities to access different tools also vary.

Systems are unique, too. A tool that is useful in one State for assessing the capacity of a very small system may not be useful for assessing the capacity of a large system. Tools to assess privately owned, ancillary systems may be different from the tools to assess municipal systems.

The matrices on the following pages provides a framework for reviewing the applicability of each tool to various aspects of capacity. The cells in the matrix have been left blank, so that each State can use it as a framework for identifying tools that address its unique situation. The tools and examples of their uses are described in detail in Appendix A.

Tools	Managerial Capacity												
	Ownership Accountability		Staffing and Organization							Effective linkages			
	Clear ownership identity	Management information systems	Clear identification of operator/manager	Training and continuing education	Sufficient staff with appropriate expertise and experience	Staff with appropriate licenses and certifications	Procedures and policies for system management and operation	Understanding of management aspects of regulatory requirements and system operations	Awareness of available external resources	Communication with other systems	Communication with customers	Communication with regulators	
Compliance data													
Sanitary surveys													
Water system plans or business plans													
Self-assessment / peer reviews													
Regional plans													
"Dozen Questions to Assess Small System Viability"													
Criteria used by lenders													
Financial viability assessment methods													
Operator certification													
Financial and managerial training													
Permit application data													
Capital improvement plans													
Comprehensive performance evaluations													
Consumer complaint records													
State-wide studies of water quality or quantity													
SRF loan applications													
Budgeting worksheets													
Annual financial reports													
Source water assessments programs													
Water conservation plans													
Emergency response plans													
Certificates of Convenience and Necessity													
Review of audit report													
Bond issue reviews													
Rate reviews and approvals													
Credit rating services													
Financial assurance mechanisms													

Financial Capacity														
Tools	Revenue Sufficiency					Credit Worthiness					Fiscal Management and Controls			
	Revenue cover expenditures	Appropriate rates and charges	Billing and collections practices	Reserves for depreciation and reserves	Cost-of-service studies	Positive credit rating	Access to financial capital through public and private sources	Healthy financial ratios	Bonds and securities	Appropriate debt/equity ratio	Adequate books and records	Annual budgeting and reporting	Appropriate accounting practices	Valuation of utility assets
Compliance data														
Sanitary surveys														
Water system plans or business plans														
Self-assessment / peer reviews														
Regional plans														
"Dozen Questions to Assess Small System Viability"														
Criteria used by lenders														
Financial viability assessment methods														
Operator certification														
Financial and managerial training														
Permit application data														
Capital improvement plans														
Comprehensive performance evaluations														
Consumer complaint records														
State-wide studies of water quality or quantity														
SPR loan applications														
Budgeting worksheets														
Annual financial reports														
Source water assessments programs														
Water conservation plans														
Emergency response plans														
Certificates of Conformance and Necessity														
Review of audit report														
Bond issue reviews														
Rate reviews and approvals														
Credit rating services														

APPLICATION OF THE ASSESSMENT TOOLS FOR NONTRANSIENT NONCOMMUNITY WATER SYSTEMS

Nontransient noncommunity water systems (NTNCs) are stand-alone water systems located in schools, day care centers, factories, offices, and other establishments with non-transient populations. Unlike community water systems, most of these systems were not designed to serve water to the public. Instead, water service is an ancillary function that is not the principal business or focus of the organization.

Unlike community water systems, non-transient noncommunity systems do not charge for their water. Instead, the cost of operating the water system is built into the cost of their product or service (if the system is a business), or is part of the cost of public services (in the case of publicly owned systems like schools).

Nontransient noncommunity systems often have simpler infrastructure than community water systems. For example, the distribution component of most NTNCs consists of plumbing inside a single building.

Because of these unique characteristics, assessment of capacity may need to be approached differently for NTNCs than for community water systems. In general, it appears that most of the tools described in the preceding sections will work for both community water systems and NTNCs. The results of a sanitary survey, for example, can be used to assess the technical and managerial capacity of NTNCs just as well as it can be used to assess the technical and managerial capacity of community water systems. Nevertheless, there may be some areas where the tools may need to be modified for the unique characteristics of NTNCs.

Technical Capacity

The three elements of technical capacity are adequacy of source water, adequacy of infrastructure, and technical knowledge. These three elements can be assessed in both community and nontransient noncommunity water systems. Clearly, NTNCs are simpler in design and construction, but most State regulations nevertheless require a review of plans and specifications before construction, just as they do for community water systems. Indeed, the plan review and inspection prior to construction is an important step in ensuring technical capacity of NTNC systems.

A State could review source water adequacy and adequacy of infrastructure for both CWSs and NTNCs. A State also could assess the technical knowledge of personnel in both types of systems, but it will be more difficult in NTNCs. The problem with NTNCs is that the person responsible will not be a water system professional.

Still, when one looks at the questions raised under the discussion of technical knowledge in Section 2 of this document, the questions seem relevant to NTNCs. One could investigate, for example, whether the system complies with all applicable monitoring requirements, whether the system has access to adequately trained personnel, and so forth. Therefore, it would appear that

the materials presented in the preceding pages can be used for NTNCs as well as community water systems.

Managerial Capacity

The three elements of managerial capacity are ownership accountability, staffing and organization, and effective external relations. NTNCs are smaller and simpler in organizational structure, but this would not preclude using the same type of approach to managerial capacity as one might use for community water systems. For ownership accountability, one would want to see if one could clearly identify the system owners and determine whether they can be held accountable for the system. For staffing and organization, one should examine staff qualifications. For external relations, one would ask whether the system's management is aware of all applicable rules and regulations.

Clearly, there are some questions that would not be applicable to all NTNCs. These questions, however, can simply be skipped. The tools presented in this chapter and discussed in Appendix A still are relevant. They simply must be adjusted for the size and complexity of system, just as they would be revised before application to a very small community water system.

Financial Capacity

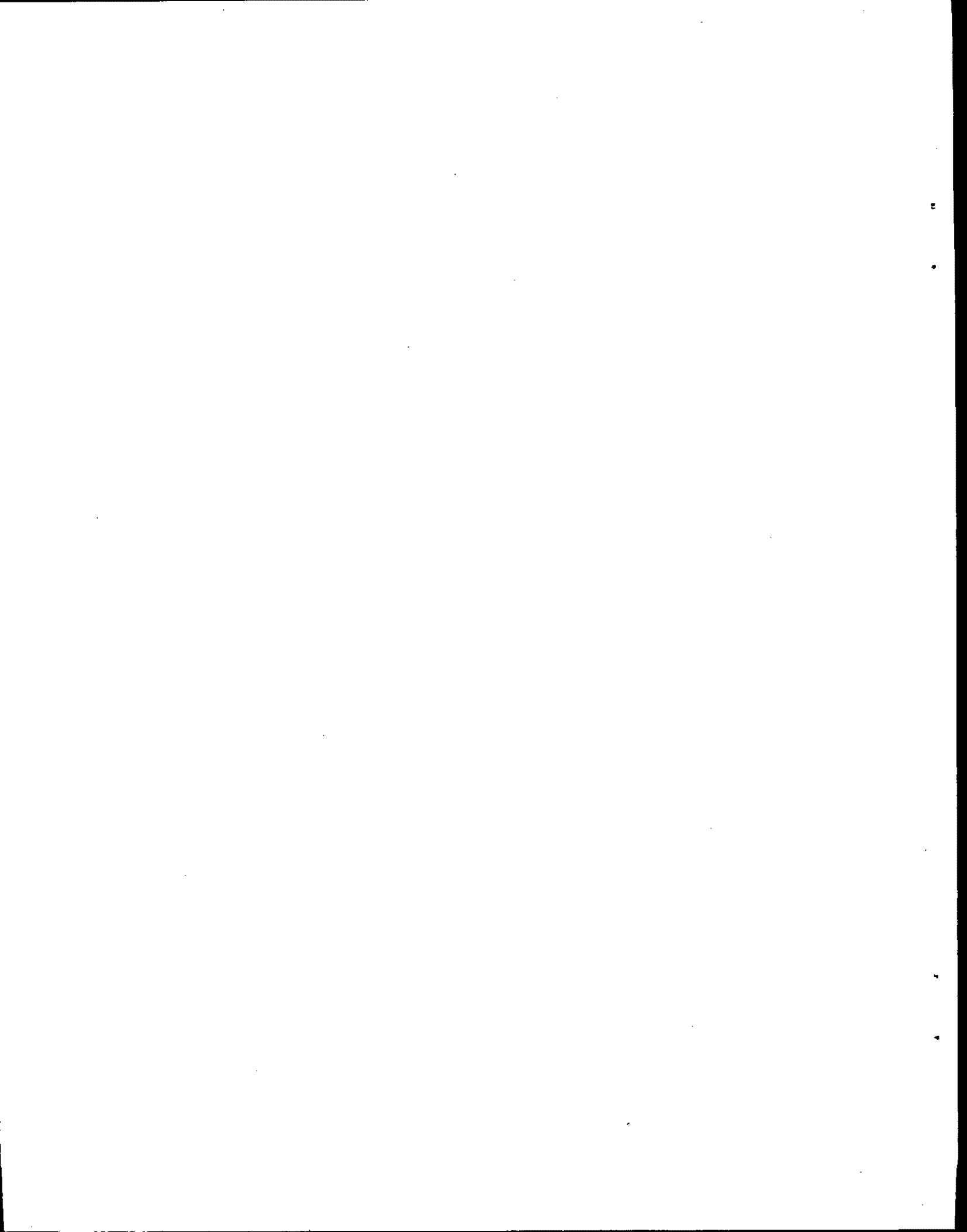
Of all the dimensions of system capacity, this is where most observers believe that NTNCs differ from community water systems. As discussed above, NTNCs generally do not charge for their water. Instead, the cost of operating the water system is built into the cost of their product or service. Therefore, when one tries to assess financial capacity, it is likely that these systems will not be able to readily produce data that would be essential to that assessment.

While it is clear that NTNCs are fundamentally different from medium-sized community water systems in terms of their financial structure, are they different from very small community water systems? Very small community water systems generally are ancillary systems such as mobile home parks, institutions, and some stand-alone multi-family housing units. These systems have financial characteristics that are similar (if not identical) to many NTNCs. They do not charge for water. The cost of water operations is built into the cost of their service. A majority of these systems is privately owned. States have developed the assessment tools described in this chapter for all community water systems, including small, ancillary systems.

States have adapted the tools for the unique financial structure of these systems. It therefore would appear that the materials presented in Section 3 could be used for NTNCs. For these tools to be effective for NTNCs, however, States will need to adapt them in the same way that they have adapted tools for the very small, ancillary, community systems.

Appendix A:

The Tools



Compliance Data

Compliance data refer to records of system compliance with State and federal drinking water regulations. These records are maintained by State primacy agencies, and much of the data is routinely uploaded to EPA's Safe Drinking Water Information System (SDWIS). Review of these data can be a simple first step in assessing certain elements of a system's technical and managerial capacity. At a minimum, States can review which systems are in significant non-compliance with regulations. In addition, States can review the details of system non-compliance. For example, if there is non-compliance, is it for monitoring and reporting, or are systems failing to comply with maximum contaminant levels or with required treatment techniques? If there is non-compliance, is it an isolated event, or a long-term pattern? A system's monitoring and reporting data also may provide information that does not result in a violation, but which nevertheless is interesting for purposes of assessing capacity (e.g., monitoring data on unregulated contaminants).

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use compliance data as part of a capacity development strategy.

- ***To prioritize systems for capacity development efforts.*** The review involves examining the system's monitoring and testing results and other compliance assurance data available to the State. This information resides in the Safe Drinking Water Information System (SDWIS) and in States' compliance databases.

As a prioritization tool, compliance data can be used to:

- Identify systems that are in significant noncompliance. Before providing funds to these systems, the State must be assured that the use of any SRF assistance will ensure compliance.
- Identify systems that are experiencing exceedences.
- Identify systems that may experience compliance problems in the future.
- Identify systems that do not appear to understand applicable monitoring and reporting requirements or have the resources it needs to meet monitoring and reporting requirements.
- ***To establish a baseline and measure improvements in capacity.*** Since the statute explicitly mentions capacity "with respect to national primary drinking water regulations," information on compliance trends could be useful. A State could use compliance data to

measure improvements in capacity. The "baseline" would be compliance records as of the calendar quarter when the capacity development efforts began. If compliance data were used, variables such as number of systems in significant noncompliance, number of exceedences, number of M/R violations, and time required to achieve compliance would be candidate measures.

In some cases, measuring improvements solely on the basis of compliance might yield an analytical framework that is too limited. Outside factors such as new regulations or new enforcement tools could influence compliance rates. In addition, trends in compliance data may not yield sufficient data over the short term because capacity development efforts result in incremental changes in capacity, some of which may not be measurable for years, if at all. This is especially true for small systems and for NCWSs, both of which are generally required to submit compliance data less often than larger systems.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use compliance data to review certain elements of a system's technical and managerial capacity.

- ***To ensure that the system is not in significant noncompliance, or that SRF assistance will assure compliance.*** Under Section 1452(a)(3) of the SDWA, SRF assistance cannot be provided to a water system that "is in significant noncompliance with any requirements of a national primary drinking water regulation or variance," unless "the use of the assistance will ensure compliance." Because of this provision, a review of a water system's compliance information is an essential step in making a decision for the SRF.

The definition of "significant noncompliance" varies by regulation, but it generally refers to long-term, repeated violations and/or violations that constitute a threat to public health. If the system is in significant noncompliance, the State *must* be assured that the use of any SRF assistance will ensure compliance. For example, if a water system is in significant noncompliance because it exceeded the MCL for nitrate, the State might opt to fund a project for a new source if the State is assured that water from the new source would meet the nitrate standard, given any treatment planned by the water system.

- ***To identify exceedences of safety standards for systems not yet in significant noncompliance.*** In some cases, a system's compliance data can reveal violations that do not lead to significant noncompliance, but may nevertheless highlight problems with the system's facilities. For example, intermittent violations of bacteriological standards may indicate a problem with the system's treatment facilities or distribution system. If the State identifies events that appear to indicate problems with the system's facilities, it should use other tools (e.g., a sanitary survey, peer review, or self-assessment) to determine if the system is taking steps to identify or address any deficiency.

- ***To identify levels of contaminants that may be regulated in the future.*** EPA's guidance on assessing capacity directs the State to ensure that the system has the capacity to comply with current *and future* SDWA requirements. A review of a system's compliance data can help States understand how future SDWA requirements might affect a system. For example, a system that serves more than 10,000 people might report a level for total trihalomethanes of 90 parts per billion, which meets the current standard of 100µg/l. but would exceed the standard in EPA's proposed Disinfectants and Disinfection Byproducts Rule of 80µg/l. Other tools would help a State understand if the water system has a plan for addressing the future requirement.
- ***To ensure that the system operators understand and implement the State's monitoring and reporting requirements, and that the system has the resources it needs to meet monitoring and reporting requirements.*** If compliance data reveal a history of monitoring and reporting violations (e.g., failure to report or sampling from an incorrect location), it may indicate that the system operator does not fully understand applicable requirements (including requirements added since the operator was first trained or certified). Monitoring and reporting violations may also indicate that the system does not have the resources it needs to meet the requirements. Resource deficiencies may include lack of:
 - Personnel trained to perform the monitoring,
 - Availability of funds to support sampling and analysis activities, or
 - Availability of a sufficient management information system to schedule and track monitoring.

If monitoring and reporting issues exist, States can use other tools to determine how a system plans to address deficiencies in its knowledge or in its ability to collect the necessary data.

Sources of Additional Information

For definitions of Significant Non-Compliance, see U.S. Environmental Protection Agency, *Water Supply Guidance Manual*. Relevant sections of this document are available from the Internet on the Office of Ground Water and Drinking Water (OGWDW) home page. You can access these documents at www.epa.gov/OGWDW.

Note to Readers: The OGWDW home page does not yet have these documents. This reference is included only as an example of how access to the Internet might be used.

If you do not have access to the Internet, call the Safe Drinking Water Hotline at 800-426-4791.

Sanitary Surveys

In 40 CFR 141.2, a sanitary survey is defined as an on-site review of the water source, facilities, equipment, operation, maintenance, and monitoring compliance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water. The survey provides the opportunity to review many facets of the system's overall operation and management with the intent of identifying and documenting actual and/or potential problems that might lead to noncompliance and/or degradation of drinking water quality.

Each primacy State must establish a systematic program for conducting sanitary surveys. In its program, a State may consider the following factors in determining which systems will be evaluated by a sanitary survey: compliance history of the system; source type, including whether a new source was recently added; treatment technology, including recent changes; system size; system type; whether the system has received a monitoring waiver; and whether the system has a new operator.

Distribution System and Storage Tank Maintenance and Cross-Connection Control

During sanitary surveys, there are a few subjects that require special attention. Inspectors or field engineers must ensure that distribution and storage components of water systems are properly maintained and that all regulations related to cross-connection control are followed. Evaluation of these components requires inspectors: 1) to perform a physical inspection of the relevant system components; and 2) to discuss with system personnel the standard procedures used for operation and management of these components. For example, if an inspection reveals fecal contamination of a finished water storage tank, it is important to identify the proximate cause (e.g., a loose-fitting cover over the storage tank) and also to identify the procedural breakdown that allowed the problem to occur.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- **To prioritize systems.** Sanitary surveys demonstrate that there are systems with ongoing, recurring deficiencies. These deficiencies often do not require compliance or enforcement action, but do constitute a basis for capacity development.

The barrier to using sanitary survey data is that many States have not assembled the data into a database that facilitates easy data retrieval. The benefits of using these data, however, are substantial. For example, sanitary survey data are constantly being updated. Also, sanitary survey procedures can be structured to provide data that are most relevant to

capacity issues. Finally, by tying sanitary surveys to a capacity development strategy, States can begin to break the cycle of recurring, uncorrected deficiencies.

- ***To assess its program on the basis of its effectiveness in reaching water systems, including number of sanitary surveys conducted.*** In order to make this more than a bean-counting exercise, States would need to ensure that the quality of its outreach was helping systems achieve and maintain capacity. In addition, States must recognize that capacity development is an incremental process and that improvements in capacity may not be immediately apparent on sanitary surveys.

Examples of Using the Tool as a Means of Assessing Capacity

The following describes how a State might use this tool as a means of assessing system capacity.

- ***To evaluate the reliability of the system's overall infrastructure, including the source protection, treatment, distribution system, and storage.*** Under Section 1452(a)(3) of the SDWA, SRF assistance cannot be provided to a water system that "is in significant noncompliance with any requirements of a national primary drinking water regulation or variance," unless "the use of the assistance will ensure compliance." Knowledge of the condition of the system's infrastructure, including its age and maintenance history, is extremely useful in assessing the system's ability to continue to provide high-quality drinking water at an affordable cost. Sanitary surveys provide an opportunity to collect and review detailed information about and directly observe the operation of this infrastructure. Some components of the technical evaluation might include:
 - Review of treatment process schematic diagrams and determination of the appropriateness of the treatments(s) given the source(s) used and raw water quality;
 - Examination of distribution system map and plan, including flushing schedules and procedures; and
 - Assessment of pump operating condition, including the presence of reserve pumps.
- ***To determine the technical competence of the system operator.*** Sanitary surveys provide an opportunity to confirm technical competence of the system operator by interviewing the operator and directly observing his or her performance. The State professional or designee conducting the survey can interview the operator about monitoring schedule requirements, technical protocols and practices, and monitoring equipment maintenance and calibration. They can also question the operator about technical aspects of treatment while touring the facility and assess the operator's ability to respond to changing water quality or emergency conditions. They can request copies of professional certifications or accreditations to verify overall job fitness and confirm any claims of auxiliary training.

- ***To assess overall management and operations of the system.*** Sanitary surveys provide an opportunity to assess the overall management and operations of the system. Direct observation of the competence of staff interviewed during the survey provide one measure of the system's management capability. Other more formal measures include review of the existence and adequacy of documents such as Operations and Maintenance manuals and plans, emergency contingency plans, management information system documentation, general personnel, purchasing, and accounting policies, and bylaws or articles of incorporation documenting the utility's decision-making structure.
- ***To transfer knowledge that promotes compliance.*** The on-site component of the sanitary survey, which involves a third-party field presence, itself results in capacity building. Specifically, State drinking water officials or approved inspectors meet with system owners and operators and other support staff. These meetings provide the opportunity to transfer knowledge about sampling and monitoring procedures, technical treatment advancements, and proposed regulatory changes. These surveys also provide both an opportunity for owners and operators to cultivate an ongoing working relationship with State personnel and information about where to turn in an emergency or what conditions warrant immediate State notification/assistance.
- ***To ensure that the system is not in significant noncompliance, or that SRF assistance will assure compliance.*** Under Section 1452(a)(3) of the SDWA, SRF assistance cannot be provided to a water system that "is in significant noncompliance with any requirements of a national primary drinking water regulation or variance," unless "the use of the assistance will ensure compliance." Because of this provision, a review of a water system's compliance information is an essential step in making a decision for the SRF. Sanitary surveys provide an opportunity to confirm compliance history by reviewing monitoring data logs and reports maintained by the system to ensure that these logs accurately reflect data reported by the systems. Additionally, they also allow an independent party to conduct on-site monitoring to verify the integrity of monitoring data recorded and reported by the system.

Sources of Additional Information

For more information on sanitary surveys, see "EPA/State Joint Guidance on Sanitary Surveys," December 1995.

Call the Safe Drinking Water Hotline at 800-426-4791, or call the Association of State Drinking Water Administrators (ASDWA) at 202-293-7655.

Water System Plans or Business Plans

The water system plan (also called a business plan in some States) is a comprehensive document which attempts to capture the true cost of building and operating a water system by projecting costs and revenues over time. The plans can be used for both new and existing water systems.

The water system plan, in contrast to the sanitary survey, covers not only the physical condition of the system's source, infrastructure, and operations, but it also covers managerial and financial issues. In addition, the water system plan is a forward-looking document that forces system owners and operators to think about, and plan for, future operation of the system.

The water system plan is a formal process that provides comprehensive and forward-looking data on financial conditions, technical ability, condition of facilities, and managerial proficiency. The water system plan attempts to capture the true cost of building and operating a water system and projects costs and revenue over time. The water system plan includes a Facilities Plan Checklist that contains a description of required infrastructure and resources, a Management Plan Checklist that describes the system's proposed (or existing) management strategy, and a Financial Plan Checklist that requires systems to provide a complete financial plan.

In order to evaluate business plans submitted in its State, the Pennsylvania Department of Environmental Protection (DEP) has developed a series of benchmarks and indicators that examine various aspects of drinking water systems and provide an overview of where a proposed system fits in relation to other existing systems. DEP uses its PAWATER cost model to perform this function. This process also provides statistically significant information on the capacity of the system. Used in this manner, the information taken from the water system plan could be an effective means of prioritizing water systems.

Washington State has a water system planning program that is based on the capacity and size of the system. It also is applied to both expanding and non-expanding water systems. It includes a comprehensive analysis of the system's capacity, and it seeks to ensure and document system capacity for the future.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- *To assist public water systems in complying with national primary drinking water regulations; and encourage the development of partnerships between public water systems to enhance the technical, managerial, and financial capacity of systems.* Water supply plans, by requiring a planning process for all systems, assist systems in complying

with all Federal and State regulations. Also, since the planning process typically involves consideration of regional solutions to system problems, it encourages the development of partnerships among systems.

- ***To assess its program on the basis of its effectiveness in encouraging systems to complete water system plans.*** The State would need to ensure that the water system plans and any related technical assistance helped systems achieve and maintain capacity.
- ***To measure "improvements in capacity."*** This process would require a baseline measure of all systems at the time when the capacity development efforts began, and a method to update system assessments on a regular basis.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use this tool as a means of assessing system capacity.

- ***To evaluate the system's technical capacity.*** The water system plan typically covers issues such as:
 - Characteristics of the service area (description of current service area and proposed or future service areas, description of neighboring water systems, current and future population estimates, current and future land use information).
 - Adequacy of source (description of source[s], evaluation of long-term source capacity given assumptions of future water demand, and assessment of water rights [if necessary]).
 - Water quality (assessment of source water quality, evaluation of potential for contamination, description of source water protection activities).
 - Facilities (assessment of system components other than source—treatment, transmission, storage, distribution, buildings, and so forth in terms of State criteria for construction and operation). For example, the distribution system should meet fire flow requirements; a hydraulic analysis should predict system pressures and flows under various situations, such as peak daily flows; the basic design should include redundancy to ensure reliable service; and so forth.
 - Operations (does the system's operations comply with applicable State and professional standards?)
 - Maintenance (are the system's components adequately maintained?)

- Emergency (does the system have back-up power and equipment to enable it to respond to emergencies?)
- ***To evaluate the system's managerial capacity.*** The water system plan typically would cover the following managerial issues:
 - Ownership (clear identity of owner).
 - Personnel (certified operator; adequacy of personnel procedures to ensure that trained personnel operate the system).
 - Organization chart
 - Understanding of regulations (owner/operator's understanding of current regulations and professional practice; owner/operator's awareness of proposed future regulations that may affect the system).
 - Management information systems (management's ability to monitor operations)
- ***To evaluate the system's financial capacity.*** The water system plan typically covers the following issues related to financial capacity.
 - Accounting (system's adherence to standard accounting practices)
 - Infrastructure replacement (plan for capital improvements as components end their useful life; recognition of useful life of infrastructure through accounting practices [if applicable]; maintenance of reserve account for replacement and contingencies).
 - Adequacy of resources (access to resources required for current and future operations; rates and other charges cover the cost of service).
 - Adequacy of financial condition (financial ratios; bond ratings [if applicable]; access to credit).
- ***A financial viability test.*** In Washington State, a Financial Viability Test (FVT) is required of all community water systems serving fewer than 1,000 service connections that must submit a water system plan. The FVT consists of four financial tests:
 - Test 1: Develop an operating budget showing that its revenues will meet all incurred expenses over a six-year period.
 - Test 2: Create and fund an operating cash reserve account at a level equal to or greater than one-eighth of its operating budget (O&M plus G&A expenses). This reserve account can be funded by a one-time charge, by a transfer of funds from an

existing reserve, or from funds accumulated in the first year of the six-year budget from Test 1.

Test 3: Create and fund an emergency reserve account to cover the cost of an emergency or failure of its most vulnerable system component (for small systems, usually a well or pump). This reserve account can be funded by a one-time charge, a transfer of funds from existing reserves, a plan to accumulate the fund in the six-year budget from Test 1, or an alternative financing arrangement (e.g., an insurance mechanism).

Test 4: Conduct a median household income index analysis. The system must demonstrate that the rates required to meet the budget from Test 1 and to fund the reserves in Tests 2 and 3 do not exceed 1.5 percent of the annual median household income for its county.

In addition to all of these elements of the water system plan, systems typically submit relevant documents that support the plan, e.g., maps of service areas, maps of facilities, and so forth.

Sources of Additional Information

For more information on water system plans, see:

Washington State Department of Health, "Planning Handbook: A Guide for Preparing Water System Plans," August 23, 1993.

Washington State Department of Health, "Financial Viability Manual for New and Expanding Small Water Systems," March 1995.

Pennsylvania Department of Environmental Protection, "Pennsylvania Water System Self-Assessment Guide," September 1996.

As a cross-reference to related tools, we suggest that readers review information on the tool called "The Dozen Questions" which is described elsewhere in this document. This simple, easy-to-understand guide to evaluating system capacity can be used by systems in the development of business plans.

Self-Assessment/Peer Reviews

Self-assessment has been used in several States to help small water system owners assess their system's capacity. Typically, to assist the system owner or operator in conducting the assessment, a self-assessment manual will be provided. The manual provides a structured system of yes/no questions which follow the major elements of a complete business plan or water system plan. Thus, the questions are organized by categories that cover issues related to technical, managerial, and financial capacity. Within each category, questions are grouped according to overall topic areas. Each topic represents an important area where there may be hidden costs in store for the water system. The manual may contain simple budget worksheets that assist the water system in using its estimates of future costs to develop an assessment of projected revenue, capital requirements, and water rates.

The "Dozen Questions" approach is one self-assessment tool. It groups important questions regarding system capacity into twelve categories. States have used these questions as part of a business plan approach or as a self-assessment exercise.

The Dozen Questions approach can be used to assist public water systems in complying with national primary drinking water regulations; encourage the development of partnerships between public water systems to enhance the technical, managerial, and financial capacity of systems; and assist public water systems in the training of operators.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To prioritize systems.*** In some States, systems have the option of forwarding the results of the self-assessment to the State. States can also encourage systems to request technical assistance if their self-assessment reveals vulnerability. However, self-assessments and peer-reviews are most effective as tools for the system to identify its strengths and weaknesses, not as tools for States to use to prioritize systems.
- ***To assess its program on the basis of its effectiveness in encouraging systems to complete water system plans or self-assessments.*** However, the State would need to ensure that the water system plans or self-assessments and any related technical assistance helped systems achieve and maintain capacity.
- ***To measure "improvements in capacity."*** This process would require a baseline measure of all systems at the time when the capacity development efforts began, and a method to update system assessments on a regular basis.

Examples of Use of the Tool as a Means of Assessing Capacity

Functionally, the self-assessment operates in a manner that is very similar to the water system plan or business plan. The self-assessment usually covers the same subjects. It simply is done in a more user-friendly manner. In a planning context (either water system plan or business plan), the system is required to submit a plan for approval by the State. In a self-assessment context, the State is more interested in a system's consideration of the issues. Plans often require the services of professional engineers or accountants. A self-assessment can be done by the system owner or operator. In fact, a self-assessment usually includes some **simplified budgeting worksheets** that enable the system owner or operator to perform quick financial analyses.

Sources of Additional Information

For more information on self-assessment and peer reviews see:

Cromwell, Schmidt and Albani, "A Dozen Questions to Assess Small System Viability," Proceedings of the 1993 AWWA Annual Conference, San Antonio, Texas.

Pennsylvania Department of Environmental Protection, "Pennsylvania Water System Self-Assessment Guide," September 1996.

Iowa Department of Natural Resources, "Self Assessment Manuals for Iowa Water System Viability," September 1996.

RCAP-Community Resource Group, "The Small System Guide to Viability."

RCAP-Community Resource Group, "The Self-Evaluation Guide for Decision-Makers of Small Community Water Systems."

Rural Water Association and American Water Works Association, Georgia Section, "Georgia's Small System Peer Review Program."

You can obtain more information by calling the RCAP-Community Resource Group at 501-443-2700, the Georgia Rural Water Association at 770-358-0221, the National Rural Water Association at 405-252-0629, or the American Water Works Association at 303-799-7711.

Regional Plans

Regional planning is a strategic management process used to coordinate resolution of drinking water issues related to population demographics, new system development, and overall water quality. The process often involves the consolidation and integration of individual water system plans and allows conflicts that might exist among individual plans to be identified. These plans are usually examined by a committee comprised of representatives of county governments, water utilities, and the State drinking water program. The committee structure also provides a forum to resolve identified conflicts.

Each State approaches regional planning differently. In many States, planning occurs at the county level and may be augmented with State oversight assistance or formal regulatory control derived from enabling laws. For example, in Maryland, counties are responsible for submitting county-wide plans for water and sewer services; the water system component of the plan must be approved by Maryland Department of the Environment. These plans must identify present and future water systems, including schedules and financial methods for new system construction. They also must provide for the development, extension, and expansion of water systems to meet county population growth over a 10-year period.

Typically, the planning committee delineates the exact boundaries of the geographic area where planning will be implemented. The committee often integrates the plans of individual water utilities located within the planning area and develops a detailed document that may include some of the following components:

- demarcation of present and future service areas;
- outline of anticipated water system development;
- itemization of procedures for authorizing new water systems;
- delineation of arrangements for shared use of facilities;
- description of minimum design and fire flow performance standards; and
- creation of satellite support systems to provide assistance to small systems.

Other States that use regional planning as an important tool for capacity development are Connecticut and Washington State.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use compliance data as part of a capacity development strategy.

- ***To assist public water systems in complying with regulations and to encourage the development of partnerships between public water systems to enhance the technical, managerial, and financial capacity of systems.*** Regional water supply plans, by requiring a planning process for all systems in a region, assist systems in complying with all Federal and State regulations. Also, since the planning process is regional, it encourages the development of partnerships among systems.
- ***To promote communication and information sharing between water systems located within the geographic boundaries of the planning area.*** In Washington State, the regional planning document explicitly specifies the types of support that large systems will provide to assist smaller systems within the jurisdiction of the plan. The support system created by the plan is a formal agreement whereby a large or central utility in a county performs direct, contract, or support services for smaller utilities.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use this tool as a means of assessing system capacity.

- ***To identify and address growth and development issues.*** Regional planning provides an opportunity to address issues related to a utility's current service area and anticipated future service area based on population projections. The first step in this process usually involves compilation of individual water system plans, which typically include information about current and anticipated service plans. Washington State, for example, requires individual water system plans to address a 20-year planning horizon. With review of these plans, committees can identify and resolve any conflicts that may exist between individual water systems.
- ***To delineate specific service areas.*** Regional planning often involves granting exclusive service areas to systems. Such systems are expected to provide water to all new residential and commercial developments contained within their respective service area, or to assist

the planning agency in developing procedures to authorize a new water system. In Connecticut, existing privately owned systems can be forced by the Department of Public Utility Control to provide water to new households in its service area. The DPUC also has the authority to establish the rates that will be charged to the new customers.

Granting exclusive service areas acts as a deterrent to unnecessary new system development. For example, with a clear delineation of a water system's current and future service areas, requests for a new water system in a yet unserved area can be coordinated with the growth and expansion plans of the system granted the right to service the area.

- ***Ensuring inter-system information sharing and technical assistance.*** Regional planning can serve to promote communication and information sharing between water systems located within the geographic boundaries of the planning area. In Washington State, the regional planning document explicitly specifies the types of support that large systems will provide to assist smaller systems within the jurisdiction of the plan. The support system created by the plan is a formal agreement whereby a large or central utility in a county performs direct, contract, or support services for smaller utilities.

Sources of Additional Information

For more information on regional planning, see:

Washington State Department of Health, "Planning Handbook: A Guide for Preparing Water System Plans," August 23, 1993.

Criteria Used by Lenders

All lenders have criteria that they use to evaluate loan applications. Some lenders have experience lending to small water systems, e.g., the Rural Utilities Service (RUS) and Co-Bank. The criteria used by these institutions, therefore, may have utility for assessment of the financial capacity of systems. Both RUS and Co-Bank provide financial assistance to small water systems. In the course of making decisions about providing that assistance, both institutions review the financial capacity of the systems that have applied for loans. Thus, a State might review the criteria used by these institutions and use these criteria to assess a system's financial capacity.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To prioritize systems for capacity development efforts.*** States may wish to develop measures that could be used to prioritize systems. Criteria used by lenders might provide examples of measures that could serve this purpose.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use this tool as a means of assessing system capacity.

- **Ensuring that the system has demonstrated that there is an adequate source of revenue for repayment of the loan.** A basic concern of both RUS and Co-Bank is that the loan be repaid. Therefore, both will look for system policies and procedures that will ensure an adequate source of revenue to repay the loan. For small systems, this generally refers to a level of fees (or taxes from publicly owned systems) that will generate an appropriate revenue stream. This may be complemented by sound financial planning, including separate accounts for debt service payments.
- **Evaluating other elements of a system's financial capacity.** Both lending institutions request several types of financial information from systems that have applied for loans.

Since the information requested has been tailored to the unique conditions of small systems, they may be particularly useful for States as they evaluate systems' financial capacity.

- **Evaluating the systems managerial capacity.** RUS looks at more than simply financial capacity. It also assesses the managerial capability of the system as an important aspect of the system's overall capacity.

Sources of Additional Information

For more information on lending criteria see:

“Financial Viability Manual for New and Expanding Small Water Systems.” Washington State Department of Health, Environmental Health Programs, March 1995.

Financial Viability Assessment Methods

State SDWA primacy agencies and public utility commissions (PUCs) have developed methods to assess the financial viability/capacity of public water systems. Typically, these methods focus on a few key financial ratios that are predictive of overall financial health. These methods may be useful for States as they assess the financial capacity of systems.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To prioritize systems for capacity development efforts.*** States may wish to develop measures that could be used to prioritize systems. Like criteria used by lenders, the financial ratios that are used in financial viability assessment methods might serve this purpose.

Examples of Use of the Tool as a Means of Assessing Capacity

Since the assessment methods are focused primarily on financial capacity, they could be considered as an adjunct to other assessment tools. The following describes how a State might use this tool as a means of assessing system capacity.

- ***Financial Ratios and Ratings.*** One of the problems that States may have when trying to apply financial ratios is deciding which ratios to use. Financial analysis typically is the strength of public utility commissions rather than SDWA primacy agencies. An advantage of these viability/capacity assessment methods is that they have been applied and tested on financial results from many utilities. The ability of each ratio to predict financial health has been assessed empirically.
- ***Adequate rates, charges, and revenues.*** One of the conclusions from the research underlying the assessment methods is that many small systems do not have adequate rates or other charges to support their current cost of service. The viability/capacity assessment methods provide mechanisms to assess the adequacy of rates and revenues.

Sources of Additional Information

For more information on regional planning, see:

Beecher and Dreese, "Financial Distress Models for Small Water Utilities," *Proceedings of the Eighth NARUC Biennial Regulatory Information Conference*, Vol. IV, pp. 175-195 (Columbus, OH 1992).

Operator Certification

One method of assessing aspects of technical and managerial capacity is to determine whether or not a system has (or has access to) the services of a certified operator.

Currently, EPA, in conjunction with a State working group and a National Drinking Water Advisory Council (NDWAC) working group, is developing guidelines for State operator certification programs. The final guidelines for States will be published not later than February 1999. Under §1419 of the SDWA, States are required to adopt and begin implementing operator certification programs for community and nontransient, noncommunity public water systems by February 2001.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To target systems without certified operators or with underqualified operators for capacity development efforts.*** Many States have data on the number of systems with certified operators and, in some cases, the qualifications of those operators.
- ***To assist public water systems in complying with national primary drinking water regulations; encourage the development of partnerships between public water systems to enhance the technical, managerial, and financial capacity of systems; and assist public water systems in the training, certification, and continuing education of operators.*** Many States believe that having access to a certified operator will increase the ability of systems to comply with national primary drinking water regulations. Also, States could identify the number of systems with certified operators and the number of operators receiving the training and continuing education necessary to improve the capacity of the systems they operate.
- ***To disseminate information to help with capacity issues through operator certification advisory boards.*** States might work with operator certification boards to develop a curriculum that would help ensure capacity. Such a curriculum might include continuing education requirements to help ensure capacity with regards to new regulations and new technologies.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use information on the operator's qualifications to review certain elements of a system's technical and managerial capacity.

- ***To assess a system's managerial and technical capacity.*** States generally agree that systems that have, or have access to, a certified operator have more adequate managerial and technical capacity.

Sources of Additional Information

For more information on operator certification, see:

Association of Boards of Certification, "Operator Certification Program Standards," January 1997.

Association of Boards of Certification, "ABC Survey of Water Treatment Certification Requirements: Preliminary Results," December 12, 1996.

"American Water Works Association White Paper on Operator Certification Programs," no date

Association of State Drinking Water Administrators, "Final Position Statement-Operator Certification," #96-03, October 30, 1996.

National Rural Water Association, "Operator Certification—the NRWA Position," Fourth Quarter 1996.

If you do not have access to the Internet, you can obtain more information by calling the Association of Boards of Certification at 515-232-3623, the American Water Works Association at 303-799-7711, the Association of State Drinking Water Administrators at 202-293-7655, or the National Rural Water Association at 405-252-0629.

Financial and Managerial Training

In 1990, EPA, ASDWA, AWWA and NRWA joined together to form the National Drinking Water Training Coalition. The purpose of this Coalition was to establish State staff and operator training programs. The Coalition was expanded in 1991 to include RCAP and the National Environmental Training Association (NETA).

One lesson learned from the work of the Coalition is that existing training programs, while adequate in addressing technical issues, are less well-developed in financial and managerial training. The 1996 SDWA Amendments emphasize that system capacity has three dimensions. It is not limited to technical capacity, but also includes managerial and financial capacity. Training programs for operators need to address all three aspects of capacity. Indeed, training on financial and managerial issues need to be given a priority that is equivalent to training on technical issues.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To assist public water systems in complying with national primary drinking water regulations; encourage the development of partnerships between public water systems to enhance the technical, managerial, and financial capacity of systems; and assist public water systems in the training, certification, and continuing education of operators.***
Many States believe that managerial and financial training are essential in helping systems to comply with regulations. Such training also assists public water systems in the training and continuing education of their operators.
- ***To assist public water systems in complying with national primary drinking water regulations; encourage the development of partnerships between public water systems to enhance the technical, managerial, and financial capacity of systems; and assist public water systems in the training, certification, and continuing education of operators.***

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use information from management and financial training programs to review certain elements of a system's managerial and financial capacity.

- *To assess system capacity.* Most training programs do needs assessments prior to development of curricula and implementation of courses. Most programs also do evaluations of the effectiveness of their training courses.

Sources of Additional Information

For more information on financial and managerial training see:

National Training Coalition, "Final Report on Training Needs and Providers," July 1997.

Andrew A. Holton, CET, "Introduction to Utility Management." This is a management training course designed for small and very small water systems.

RCAP-Community Resource Group, "The Small System Guide to Financial Management," "The Small System Guide to Planning, Financing and Constructing Facility Improvements."

You can obtain more information by calling the Association of State Drinking Water Administrators at 202-293-7655, or RCAP-Community Resource Group at 501-443-2700.

Permit Application Data

Permitting is a process designed to help ensure that public water systems are complying with all applicable environmental and public health regulations and that they will have adequate technical, managerial and financial capacity to reliably provide safe drinking water. The State's authority to issue a permit establishes an opportunity for the State to assess system capacity. The requirement to renew operating permits ensures that this assessment of system capacity will be repeated periodically.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To prioritize systems.*** Permitting requirements can provide a wide range of data that could be used by States to prioritize systems. Since permitting requirements vary across States and the availability of existing data in accessible databases will differ, the ability to use this tool will be State-specific.
- ***To identify affected stakeholders by alerting permittees to the capacity development process.***

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use this tool as a means of assessing system capacity.

- ***To assess overall management and operation capabilities of the system.*** Permit applications collect information that can be used to evaluate the overall management and operation capabilities of a water system. The permit applications of most States have components that include, to varying degrees, technical, managerial, and financial support documentation. Typical subjects that may be covered in permit applications include:

Technical. Service area information, source(s) of water supply, monitoring plans, operation and maintenance plans, growth plans, regulatory compliance plans, and construction plans.

Managerial. Legal basis for system organization, management structure and procedure description, summary of supervisory and operating personnel experience.

Financial. Projected short- and long-term revenue and cash flow projections, including detailed yearly anticipated costs for operations, system improvements and maintenance, monitoring, and administration.

- ***To promote system compliance with drinking water regulations.*** Permitting can be used to promote system compliance with drinking water regulations by requiring periodic renewal of permits. The renewal process gives the permit issuer -- either a State or county government entity--the opportunity to review the system's compliance history and identify any potential infrastructure problems that might lead to possible violations of drinking water standards. Information obtained through the renewal process also could be used to assess system capacity.

Sources of Additional Information

For more information on permitting see:

U.S. Environmental Protection Agency, "Initial Summary of Current State Capacity Development Activities," EPA Document # 816-S-97-001, January 1997. This report reviews State capacity development efforts as of August 1996. It responds to the statutory mandate contained in §1420(d)(2) of the SDWA.

Capital Improvement Plans

A Capital Improvement Plan (CIP) is a document produced by a local government, utility, or water system that thoroughly outlines, for a specified period of time, all needed capital projects, the reason for each project, and their costs. Often, it will also provide the source of funding. Almost all large water systems develop CIPs, but only a limited number of small systems use this tool. Investor-owned small systems and small systems in States with a strong emphasis on planning are more likely to develop CIPs.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To prioritize systems.*** Capital improvement plans provide outstanding forward-looking financial and technical data for a system. Typically, the capital improvement plan will provide information on all capital projects planned by a system for five, ten, or twenty years into the future. Capital improvement plans are generally completed only by larger water systems.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use contents of a CIP to review certain elements of a system's capacity.

- ***To evaluate the system's ability to identify needed capital improvements.*** Often, CIPs include a description and assessment of the system's existing infrastructure. They always include information on infrastructure needs. States can use a CIP to ensure that the system has accurately evaluated its capital improvements needs. States can compare the needs listed in the CIP with needs listed in other sources, such as a recent sanitary survey or CPE.

The State can check to see if the system has budgeted adequately for equipment replacement and refurbishment in addition to new equipment. Reviewing the system's

plan for infrastructure replacement helps ensure the State that the rate of infrastructure replacement is sufficient, given the expected life of the equipment. For example, if the system has 200 miles of distribution piping and plans on replacing only 1 mile per year (0.5%), it would take 200 years to replace the entire system.

Finally, the State can use the CIP to help determine if the system has an adequate plan for the future. Many CIPs contain 5-year plans, but, in some cases, a 20-year plan may be more appropriate. Longer term plans may be contained in separate documents, which the State should also review.

- ***To evaluate the estimates of infrastructure needs.*** Usually, CIPs include cost estimates developed by certified professional engineers, often as part of a contractor's bid for specific infrastructure. States can review the reasonableness of these estimates, based on similar projects in other water systems.
- ***To evaluate the system's strategy for financing infrastructure improvement.*** The system's CIP can be used to determine if the system has identified adequate funds for the capital improvements. States can also use the CIP to determine if the system maintains adequate reserve accounts. Moreover, the CIP might include a cost-of-service analysis, which helps the State understand the basis for the water system's rate structure.
- ***To evaluate the managerial capacity of the system.*** A well-managed system will develop a CIP that helps customers and local regulatory authorities understand and appreciate the need for infrastructure improvements and rate increases. Therefore, a review of the CIP could help the State understand the system's capacity in this important aspect of managerial capacity. In addition, the quality or quantity of information in a CIP could provide insight into a system's management information system (MIS).

Sources of Additional Information

For more information on CIPs see:

The "PAWATER Model." This model validates cost estimates and provides comparative information between proposed and existing water systems. Contact the Pennsylvania Department of Environmental Protection, 400 Market Street, Harrisburg, PA 17105. (717) 783-2300.

Comprehensive Performance Evaluation

The Comprehensive Performance Evaluation (CPE) is the first of two formal procedures developed as part of the Composite Correction Program (CCP) approach to optimizing surface water treatment plant performance. A CPE is a thorough review and analysis of a surface water treatment plant's design capabilities and associated administrative, operation and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve optimal performance.

A CPE involves several activities: evaluation of the major unit processes, assessment of plant performance, identification and prioritization of performance limiting factors, assessment of the applicability of a follow-up Composite Technical Assistance program (the second phase of the CCP approach), and reporting of the results of the evaluation. The recommended CPE format utilizes a series of detailed interview/investigative forms and defined evaluation procedures to provide consistent and comparable results. A significant aspect of this is the list of definitions for assessing performance limiting factors in administrative, maintenance, design and operations areas. Completion of all activities would be necessary to apply findings of a CPE to an assessment of small water system capacity.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To prioritize systems.*** A CPE is a thorough review and analysis of a surface water treatment plant's design capabilities and associated administrative, operation and maintenance practices. Completion of a detailed list of activities would be necessary to apply the findings of a CPE to an assessment of water system capacity. However, the tool is only appropriate for surface water systems and is thus limited for the purpose of statewide prioritization.
- ***To assess its program on the basis of the number of CPEs conducted.*** In order to make this more than a bean-counting exercise, however, States would need to ensure that the

quality of its outreach was helping systems achieve and maintain capacity by monitoring the results of the evaluation.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use results of a CPE to review certain elements of a system's technical and managerial capacity.

- ***To ensure that the system is well-operated.*** The results of a CPE provide an evaluation of the major unit processes, an assessment of plant performance, a list of performance limiting factors, and a recommendation on the need for follow-up. Each of these distinct activities will help the State and the system understand if the system is using appropriate treatment technology, operating the plant for optimal performance, and implementing an effective maintenance program. From a managerial perspective, the evaluation also helps ensure that system operators understand the plant.
- ***To ensure that the system operators understand the most effective course for obtaining or maintaining technical capacity.*** A primary objective of the CPE is to determine if significant improvements in treatment performance can be achieved without major capital expenditures. Comparing the results of a CPE to the planned infrastructure improvements outlined in the SRF application can help the State determine if the system has the capacity to understand its needs and allocate its budget appropriately.
- ***To ensure that the system has implemented appropriate administrative and management policies.*** During a CPE, system staff are evaluated for the manpower allotted to the treatment facility, workload distribution, aptitude, qualifications, knowledge, personnel turnover, familiarity with plant needs, and level of supervision.
- ***To understand administrative and managerial factors that may impede compliance and capacity.*** The evaluation of administrative performance-limiting factors is a subjective effort, primarily based on management and staff interviews. It also requires a thorough understanding of the design, operations and maintenance issues impacting the plant so that the evaluator is better equipped to ask insightful questions about the plant and policies.
- ***To understand the system's financial planning strategy.*** A CPE utilizes records and discussion of a system's budget and financial planning to illustrate a plant owner/administrator's objectives. The extent of bond indebtedness, the rate structure and

resultant revenue, and projects planned by administrative officials reveal their priorities and desire to create and maintain a self-supporting utility.

- ***To evaluate the system's knowledge of technical needs and the funds available to meet these needs.*** Technical problems identified by plant staff or the CPE evaluator, and the potential costs associated with these problems, often serve as the basis for assessing administrative factors. Both sides of the story, operational and administrative, are necessary to determine the nature of existing policies. Implemented CPEs have revealed several instances where inadequate communications have resulted in under funding or expenditures which did not result in plant performance improvement.

Sources of Additional Information

For more information on CPEs see:

U.S. Environmental Protection Agency, **Summary Report: Optimizing Water Treatment Plant Performance with the Composite Correction Program**, EPA/625/8-90/017, March 1990.

Consumer Complaint Records

This tool refers to a State's record of consumer complaints regarding the water system. These records may reside with the State primacy agency or with regional or local authorities. State housing commissions may receive information on water systems operated by developers, neighborhood associations, or communities of manufactured housing. The State public utility commission receives complaints regarding investor-owned utilities and other utilities within its jurisdiction.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To prioritize systems.*** This is one criterion that States could use to develop a system of prioritization. It is not likely to be the most important criterion, particularly when compared with compliance and financial capacity. Nevertheless, it might be considered.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use consumer complaint records to review certain elements of a system's technical and managerial capacity.

- ***To identify technical problems in the water system.*** Sometimes, consumer complaints might help identify problems with the water system. The most common consumer complaints usually concern taste, odor, or low pressure. The State can use follow-up information on the complaint or other tools to determine if the system is taking steps to identify the source and find a solution to any problem.
- ***To identify problems in the system's billing and collection procedures.*** If there are problems with a system's billing and collection procedures, consumers are likely to complain. Consumers may complain that they were over-billed, or that the water system fails to recognize receipt of their payments.

- ***To evaluate a system's efforts at customer outreach and service.*** When a large number of complaints is received about a specific system, it can indicate that the system does not have an adequate outreach program. States can evaluate the complaints to determine: if the system is failing to provide the service it promises, if it is providing insufficient information on the quality of drinking water, if it has failed to explain the reasons for rate increases, or if it is not addressing other customer concerns.

Sources of Additional Information

As mentioned above, States have different methods of recording consumer complaints but most have records at either the State, regional or local level.

State-Wide Studies of Water Quality or Quantity

This group of tools includes studies dealing with topics such as contaminant occurrence, ground water subsidence or other quantity issues, and/or pesticide usage or other watershed management concerns. Such studies may be produced by the State primacy agency, regional or local authorities, large water systems, academic institutions, or they may appear in trade journals.

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To prioritize systems based on the adequacy of a system's water quality or quantity.*** In some cases, particularly systems with bad raw water quality, quality may be a very important factor in assessing priorities. Water quantity problems also may be a criterion, particularly in western States.
- ***To encourage the development of partnerships between public water systems to enhance the technical, managerial, and financial capacity of systems.*** Systems with water quantity problems may present situations that are best resolved through partnerships between and among systems to optimize the use of scarce water resources. Quantity problems often are amenable to regional solutions.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use State-wide studies to review certain elements of a system's technical and managerial capacity.

- ***To identify potential water quality or quantity issues.*** Often, States or institutions within the State will conduct studies to estimate the impact of future regulations. Such studies may indicate that the system is located in an area where a future standard may pose a problem. Studies may also indicate that the system is located in a watershed where activities such as fertilizer or pesticide use may affect the quality of the system's source. Further, a study may show that a system is in an area affected by source depletion issues.

The State could use other tools to ensure that the system is prepared to deal with potential water quality and quantity problems identified in State-wide studies.

Sources of Additional Information

Examples of State-wide studies of water quantity or quality are conducted by a variety of different organizations and thus can be found in an equally wide variety of sources. Two examples of such studies are:

Kolpin, Dana, Stephen J. Kalkhoff, Donald A. Goolsby, Debra A. Sneck-Fahrer, and E. Michael Thurman. "Occurrence of Selected Herbicides and Herbicide Degradation Products in Iowa's Ground Water, 1995." *Ground Water*. 35.4 (July-Aug 1997): 679-688.

Stuart, Maureen A., Frederick J. Rich and Gale A. Bishop. "Survey of Nitrate Contamination in Shallow Domestic Drinking Water Wells of the Inner Coastal Plain of Georgia." *Ground Water*. 33.2 (Mar.-Apr. 1995) 284-290.

Information on the Targeted Watershed Approach in Illinois can be accessed on the Internet at www.epa.state.il.us/org/bow/targeted-watershed. Additional information on State-wide water quality and quantity studies can be found on a variety of State home pages.

SRF Loan Applications

Much of the review of a system's SRF loan application occurs during the development of the State Priority List. However, reviewing the SRF application can also help the State assess the system's technical, managerial, and financial capacity. In particular, the State should examine the system's ability to identify a dedicated source of funds for repayment (or loan security, in the case of private systems).

Examples of Using the Tool as Part of a Capacity Development Strategy

The following describes how a State might use this tool as part of a capacity development strategy.

- ***To prioritize systems.*** Under the 1996 SDWA, States must provide assurances that water systems receiving SRF assistance currently have the technical, managerial, and financial capacity to meet SDWA requirements, or that the SRF assistance will help them attain capacity. As a result, SRF loan applications should be tailored to elicit from systems the data most relevant to prioritization.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use an SRF application to review certain elements of a system's technical and managerial capacity.

- ***To ensure that the system has identified a dedicated source of revenue for repayments (or in the case of a privately-owned system, demonstrates that there is adequate security).*** In accordance with the SRF guidelines, the State must adopt policies and procedures to assure that borrowers have a dedicated source of revenue for repayment (or adequate security). Generally, loan applicants work with the County Council (or similar body) to pass a resolution to reserve revenues from user fees, taxes, or other sources for this account. The system's ability to accomplish this helps demonstrate its ability to engage in sound financial planning, establish appropriate user fees, work with local regulators, and obtain the necessary political support for its system.

- ***To evaluate other elements of a system's financial capacity.*** Many States are requesting basic financial data of SRF applications or pre-applications. The types of data requested are modeled after the information requested in the Clean Water SRF program. They are aimed at determining municipal financial conditions and can often be used in conjunction with a State's disadvantaged community program. Information requested often includes debt information (e.g., debt level, debt per capita, debt as a percentage of full market property), financial operations (e.g., property tax collection rates), socioeconomic indicators (e.g., median income, employment, and poverty level), and information to assess user fee impact (e.g., user fees as a percent of median household income). States should note, however, that the financial capacity of the municipality does not necessarily correlate with the capacity of the water system. System-level indicators, such as cost-of-service analyses, should also be examined.
- ***To evaluate a system's knowledge of its current and future infrastructure needs.*** Generally, a system's application, pre-application, or letter of interest will contain justification for the needed infrastructure improvement. Based on the quality of the justification, a State may be able to draw conclusions about the system's understanding of its infrastructure needs.

Sources of Additional Information

For more information on SRF applications see:

U.S. Environmental Protection Agency, "Drinking Water State Revolving Fund Program Guidelines," EPA 816-R-97-005, February 1997. This document was developed to provide a description of guidelines that will apply in the operation of the DWSRF program.

Annual Financial Reports

Contents of annual financial reports will vary depending on the size of the system, the sophistication of the system, and on the accounting system adopted by the system. The major variable affecting accounting structure is whether the system is publicly or privately owned, but there also are variations within publicly owned systems, depending on whether the system has adopted an enterprise fund method of accounting. At a minimum, annual financial reports include: itemizations of operating expenditures and capital expenditures, revenues and other sources of income, debt service expenditures, and the status of reserve accounts. For investor-owned systems and some publicly owned systems, the financial reports also will include balance sheet information (assets and liabilities). In some cases, systems may provide cost-of-service analyses, comparisons with previous years' expenditures, information on stock value and dividends (for investor-owned systems) discussions of the system's investment strategy, and predictions of future years' revenues and expenditures.

The most systematic source of annual financial reports is public utility commissions (PUCs) for systems that they regulate. These reports generally follow the same format, use a uniform system of accounts, and are reviewed by commission staff. Annual reports to commissions always contain data on operating and capital expenditures, revenues, and they usually contain information on operations, service area, customer base, source of supply, pumpage rates, and other information on system finance and operations. Annual reports to PUCs are not likely to have much forecasting information; instead, they provide a good baseline of current operations.

Examples of Using the Tool as Part of a Capacity Development Strategy

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** Annual financial reports are an excellent source of current financial information. If collected uniformly, this data source could provide important financial data as part of a State prioritization method. For example, one method for establishing priorities for a capacity development strategy would be to assign highest priority to those systems in the worst financial condition. One could use one or more of the standard financial ratios that are used to assess the financial health of water supplies—e.g., the operating ratio, the debt service coverage ratio, the net takedown ratio, and so forth.
- ***To establish a baseline and measure improvements in capacity.*** If improvement in the financial health of water systems was a top priority of a capacity development strategy, and

if data were available from all systems, one could measure improvement in terms of changes in the financial ratios described in the previous paragraph. One should keep in mind, however, several caveats about this approach:

- Capacity development is an incremental process. It may not result in improvement in financial ratios in one, or even several, years.
- Financial ratios may get worse, not better, if systems are improving their overall capacity. If, for example, a major problem facing systems was the lack of investment in infrastructure, then the State capacity development strategy may recommend such investment. That may require additional debt, and (other things being equal) this may cause the debt service ratio to get worse, not better.
- One must remember that annual financial reports are "snapshots" of financial conditions at a single point of time each year. Depending on the timing of rate increases, this "snapshot" may not be a good measure of the financial health of systems. A better approach would be to track financial data longitudinally and look at trends over time for each system.

Examples of Use of the Tool as a Means of Assessing Capacity

The following describes how a State might use annual financial reports to review certain elements of a system's technical and managerial capacity.

- *To evaluate the system's operating and capital expenses.* In evaluating expenses, the State might consider the following:
 - *Ability to specify expenses.* Is the system able to provide complete information on its expenses? Does it differentiate between operating and capital costs?
 - *Adequacy of expenses.* Are the expenses consistent with other utilities in the area? Do they appear reasonable and adequate?

- ***To evaluate the system's revenues.*** In evaluating revenues, the State might consider the following:
 - *Ability to specify revenues.* Is the system able to provide complete information on its revenues (e.g., water-related revenues, contributions/connection fees, grant proceeds, etc.)?
 - *Appropriateness of water rates.* Does the system include a Cost-of-service analysis? Are rates set to reflect the true cost of providing water? Are they consistent with rates of nearby systems?
 - *Budget deficit/surplus.* If the system has accurately identified its expenses and revenues, States can easily review the system's budget, surplus or deficit. (A budget deficit, say in one year, does not necessarily indicate that the system is not financially viable. For example, the system could be phasing in a rate increase.) States can also review the revenue per number of connections and total revenue per gallons sold to determine if these values fall within regional averages.
- ***To evaluate the system's reserves.*** Does the system differentiate between operating accounts and reserve accounts? Does it provide annual contributions to a reserve account?
- ***To evaluate the system's future expenditures.*** In some cases, the financial report may include predictions of future revenue and expenditures. In evaluating this information, the State might consider the following:
 - *Completeness of listed capital improvements.* Is there evidence that the system has identified a complete list of capital improvements? Has the system budgeted for equipment replacement and refurbishment in addition to new equipment? Are all items on a recent sanitary survey addressed? Has the system anticipated infrastructure improvements needed to comply with future regulations, if applicable?
 - *Reasonable predictions of operating expenditures and revenues.* Has the system provided reasonable estimates of future revenues and expenditures? Are expenses and revenues in line with current expenditures and revenues, or, if not, are deviations explained? Are revenues and expenses in line with other water systems in the area?
 - *Capital sources.* (This evaluation will depend on whether the worksheet funds for the capital improvements?)

Sources of Additional Information

For more information on annual financial reports see:

National Association of Regulatory Utility Commissioners, *Uniform System of Accounts for Water Utilities (by class)*.

Cooperation of Industry Groups, Lenders

An effective capacity development strategy will rely extensively on cooperation between the SDWA State primacy agency and other groups that can help to implement the strategy. For example, if the primacy agency wants to implement a strategy that relies on public education of potential home buyers, then cooperation of the mortgage lender community can be an important asset. Mortgage lenders can assist in public education by telling prospective home buyers of the value of reliable water systems. Similarly, the primacy agency might need the cooperation of organizations that represent the water supply industry. Organizations like the American Water Works Association (AWWA) and the National Rural Water Association (NRWA) are important allies in the development of public education programs, technical assistance programs, and other efforts that may be part of the capacity development strategy.

Examples of Using the Tool as Part of a Capacity Development Strategy

Developing relationships with industry groups and with lenders can be used to develop and implement a State's capacity development strategy. These relationships are important in two ways.

- ***To identify factors that encourage or impair capacity development.*** Relationships with industry groups and lenders can be factors that encourage capacity development. They assist, for example, in helping systems comply with regulations by informing and training system owners and operators. They also encourage the development of partnerships between public water systems to enhance the technical, managerial, and financial capacity of systems. In addition, developing relationships with lenders helps ensure their participation in the capacity development process—e.g., to help educate prospective homebuyers about the value of safe drinking water.
- ***To identify stakeholders who have an interest in or are involved in the preparation and implementation of the capacity development strategy.*** Relationships with industry groups are essential to identification of some of the most interested parties, the owners and operators of public water systems.

Sources of Additional Information

For more information on cooperation with industry groups and lenders see:

A Guidebook of Financial Tools. Environmental Finance Program.

This document is available through the EPA home page. You can access this document at www.epa.gov/efinpage/guidebk/guindex.htm.

Information on organizations can be found at:

American Water Works Association: www.awwa.org

National Rural Water Association: www.nrwa.org

Rural Community Assistance Program: www.rcap.org

Public Education and Information

Public education and information is at the heart of many capacity development strategies. The theory behind these strategies is that if the public (including system owners and operators) is fully informed of the costs associated with operation of a reliable water system, the options available for meeting the water supply needs of the public, and the association between public health and sound drinking water infrastructure, then responsible citizens will generally choose the least-cost option that protects public health. Similarly, if prospective home buyers were aware of the risks and potential costs associated with joining a homeowners association that owns its own water system, then there would be pressure on developers to rely more extensively on professionally managed water systems.

Examples of Using the Tool as Part of a Capacity Development Strategy

Public education could be applied to several elements of the capacity development strategy in the following ways:

- *To assist public water systems in complying with national primary drinking water regulations; and to encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity.* Public education can be used to assist public water systems in achieving both of these objectives.
- *To identify stakeholders who have an interest in or are involved in the preparation and implementation of the capacity development strategy.* Public education could play a role in identifying interested persons by informing the public of the issue and the opportunity to participate. In addition, public education empowers the general public to participate as an informed party in the preparation of the capacity development strategy.

Sources of Additional Information

For more information on public education see:

Powell, John R., David J. Allee and Charles McClintock. "Groundwater Protection Benefits and Local Community Planning: Impact of Contingent Valuation Information." *American Journal of Agricultural Economics*. 76 (Dec. 1994): 1068-1075.

Public Involvement Strategies: A Manager's Handbook. AWWARF. Denver: 1996.

For a case study that offers a model of integrating public involvement with water supply planning see*:

Plank, R. David, Roddy Rogers, Frank L. Shorney, David J. Novak and Robert R. Zion. "Public Involvement Helps Supply Project Succeed." *Journal of American Water Works Association*. (May 1997): 40-54.

*This case study focuses on a large water system but is included here because the utility involved was extremely successful in educating and involving the public in the water supply project.

Rate Reviews and Approvals

Public utility commissions (PUCs) periodically review the rate structures of the public water systems that they regulate. The theoretical ideal is to set rates equal to the cost of service plus a reasonable return on investment. Since the cost of service changes periodically, it is useful to review costs and rates and determine whether systems are, in fact, recovering their full cost of service. Approval of the rate application is largely contingent on having adequate records to determine cost-of-service and the valuation of rate base.

For medium and large systems, rate reviews are undertaken at the initiative of the system. For small systems, however, PUCs may order a "staff-assisted rate case," where professional staff from the PUC provide technical assistance to the small system for rate review. This can be an excellent way for small systems to examine their financial capacity.

The review of a rate application requires the collection of substantial information that may be relevant to issues of capacity development. For example, PUCs routinely consider the results of sanitary surveys. There also may be an on-site inspection of the facilities to determine whether deficiencies noted on the sanitary survey have been addressed.

The volume of water purchased or pumped by the utility is compared with the water billed to customers. Significant differences are noted and the utility may be advised to initiate a leak detection program. The rate review process also identifies those systems which are not metered or which use flat rates. The utility may be ordered to meter customers or to set rates based on usage. This process encourages conservation and helps to identify systems with significant leaks.

Customers are notified of the rate change application and have an opportunity to protest the rates or the service provided by the utility. Customer complaints during the rate approval process could be another source of information indicating system deficiencies that should be addressed.

Examples of Using the Tool as Part of a Capacity Development Strategy

Rate reviews provide another source of data that can be used to develop and implement a State capacity development strategy. In States where the number and percentage of PUC-regulated systems is large, the information obtained during the rate review can help the State in two ways:

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** Data from rate reviews can be used to help prioritize systems. This depends, of course, on the quality and uniformity of information obtained. If data from rate reviews are not of uniform quality, or if the number and percentage of systems with reviews is small, the data could be used to supplement other data sources.
- ***To establish a baseline and measure improvements in capacity.*** The data from rate reviews may be used to measure progress. A longitudinal analysis of the technical, financial, and managerial capacity of systems, as measured by information obtained during rate reviews, could be used to supplement information on these subjects gathered from other sources.

Examples of Use of the Tool as a Means of Assessing Capacity

- ***To assess Technical Capacity:*** The review of a rate application considers the sanitary survey and possibly an on-site inspection of the facilities. The volume of water purchased or pumped by the utility is compared with the water billed to customers. Significant differences may indicate the need for a leak detection program. These types of information provide substantial insights into the technical capacity of the system.
- ***To assess Managerial Capacity:*** All systems submitting a rate application will be subject to an inspection of the records by PUC staff. Accounting procedures, as well as billing and collection procedures, are evaluated. The utility must have adequate records to determine cost-of-service and the valuation of rate base. These are indicators of managerial capacity.
- ***To assess Financial Capacity:*** The PUC reviews cost-of-service, valuation of rate base, depreciation expense and the debt/equity ratio to ensure appropriate rates. This information could assist in assessing financial capacity of systems regulated by the PUC.

Sources of Additional Information

For more information on rate reviews see:

Public Utilities Commission, State of California, Proceeding No. I.90-11-033, "Staff Report on Issues Related to Small Water Utilities," June 10, 1991.

AWWA Research Foundation, "Meeting Future Financial Needs of Water Utilities."

Cooperation with Non-Governmental Organizations

Non-governmental organizations have an important role to play in the implementation of capacity development strategies. Non-governmental organizations that are active in the field of public water supply are organizations like the American Water Works Association, the National Rural Water Association, the Association of Metropolitan Water Agencies, the National Association of Water Companies, the Association of Boards of Certification, the Rural Community Assistance Program, and others.

These organizations offer a non-governmental and non-regulatory resource for technical assistance and training services for public water systems. Developing relationships with non-governmental organizations helps ensure their participation in the capacity development process. In addition, because they are non-governmental and non-regulatory, their assistance is more likely to be effective for many small water systems.

Examples of Using the Tool as Part of a Capacity Development Strategy

Cooperation with non-governmental organizations can assist the State in developing a capacity development strategy in several ways.

- *To assist public water systems in complying with national primary drinking water regulations; encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity; and assist public water systems in training, certification, and continuing education of operators.* Cooperation with non-governmental organizations could assist the State in achieving all of these objectives.
- *To identify stakeholders who have an interest in or are involved in the preparation and implementation of the capacity development strategy.* Non-governmental organizations such as those listed in the paragraphs above are important stakeholders.

Sources of Additional Information

For more information on Non-Governmental Organizations see:

American Water Works Association: www.awwa.org

Association of Metropolitan Water Agencies: www.amwa-water.org/water

National Rural Water Association: www.nrwa.org

Rural Community Assistance Program: www.rcap.org

Big Brother and Buddy System Programs

Several State SDWA primacy agencies, working cooperatively with organizations representing utilities (e.g., American Water Works Association or National Rural Water Association) have experimented with "big brother" or "buddy system" programs. These programs encourage partnerships between water systems, pairing a well-managed system with one that needs help. The idea is that the well-managed system can train and provide technical assistance to the system that is less well-managed.

In a "big brother" program, the well-managed system usually is a large system, and the system that needs help usually is small. In some respects, this arrangement begins to look somewhat like a satellite management program. The "buddy system" arrangement pairs two systems of equal size, generally two small systems. The theory is that matching systems of relatively equal size will offer a better understanding of the problems to be resolved and a better acceptance of peer-level assistance and training.

Examples of Using the Tool as Part of a Capacity Development Strategy

Big brother and buddy programs can be used in the following ways to assist in the development and implementation of a State capacity development strategy.

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** The identification of systems being assisted by big brother and buddy programs could be one type of information that can be used to identify and prioritize public water systems most in need of improving technical, managerial, and financial capacity.
- ***To assist public water systems in complying with national primary drinking water regulations; encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity; and assist public water systems in training, certification, and continuing education of operators.*** Big brother and buddy programs are examples of partnerships between public water systems to enhance technical, managerial, and financial capacity.

Sources of Additional Information

For more information on buddy system programs see:

Association of State Drinking Water Administrators, *Enhancing Drinking Water System Viability: Options for States*, December 15, 1995, p. 19.

Restructuring

One approach to improving system capacity is to consider restructuring. This is a broad term referring to a wide range of changes a system could make its operations, management, or institutional structure. Restructuring means changing the way a system does business in order to ensure its customers the best possible service at the lowest possible cost.

Experts who have written about restructuring often categorize restructuring strategies into two broad categories: internal and external. Internal strategies seek to provide greater access to capital financing and operating efficiency. External strategies involve collaboration with neighboring systems to achieve the advantages of economies of scale.

An example of internal restructuring would be raising rates, thereby improving the financial condition of the system and providing greater access to capital markets. External restructuring may be categorized into two types: consolidation (e.g., physical restructuring, mergers, and acquisitions), or cooperation (a variety of methods including contract operations and maintenance agreements). Thus, external restructuring could include a wide range of changes, from mergers and acquisitions to satellite management, contract O&M, and even "big brother" arrangements.

Examples of Using the Tool as Part of a Capacity Development Strategy

Restructuring can be used in the following ways to assist in the development and implementation of a State capacity development strategy.

- *To assist public water systems in complying with national primary drinking water regulations; and to encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity.* Restructuring is a tool that could be used in the consideration of this element of the strategy. It is designed to improve compliance and encourage partnerships.

Examples of Use of the Tool as a Means of Assessing Capacity

Restructuring also could be used in a general way to assess all aspects of capacity of systems applying for SRF assistance. A State might, for example, require that States requesting assistance demonstrate that they have considered restructuring options prior to proposal of any major infrastructure improvements. Restructuring is a means of ensuring that water system customers obtain the best possible service at the lowest cost, and it may help States and systems to consider least-cost alternatives to new construction.

Sources of Additional Information

For more information on restructuring see:

U.S. Environmental Protection Agency, *Restructuring Small Drinking Water Systems: Options and Case Studies*, 1996.

Castillo, Eloise Trabka, Scott J. Rubin, Sally Keefe and Robert S. Raucher. "Restructuring Small Systems." *Journal of the American Water Works Association*. (January 1997): 65-74.

Satellite Management

Satellite management generally refers to an arrangement whereby a large community water system (e.g., a municipal or county system) agrees to become responsible for specified management tasks for nearby smaller systems. The smaller systems therefore become "satellites" of the larger system. A variation on this arrangement is satellite ownership where the assets of the smaller system are transferred to the larger system.

The generic concept of satellite management is applied in many different ways across the country. In Washington State, for example, satellite management was a central concept in regional water supply plans. Counties, in particular, were urged to offer satellite management services to small water systems in their service area. More recently in Washington, a new statute has enlarged the role of satellite management and seeks to provide incentives for large systems to become certified satellite management agencies.

Each State will want to shape the concept of satellite management to fit its unique circumstances. In Washington State and many other States, the most likely candidates to become satellite managers are large publicly owned systems like counties. In States where large investor-owned utilities are predominant, however, it may be useful to encourage these systems to engage in satellite management.

Examples of Using the Tool as Part of a Capacity Development Strategy

Satellite management, like restructuring, can be used in the following ways to assist in the development and implementation of a State capacity development strategy.

- ***To assist public water systems in complying with national primary drinking water regulations; and to encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity.*** Satellite management is one tool that could be used in the consideration of this element of the strategy. It is designed to improve compliance and encourage partnerships.

Examples of Use of the Tool as a Means of Assessing Capacity

Satellite management could be used in a general way to assess all aspects of capacity of systems applying for SRF assistance. A State might, for example, require that States requesting assistance demonstrate that they have considered satellite management options prior to proposal of any major infrastructure improvements.

Sources of Additional Information

For more information on satellite management programs, see:

Washington State Department of Health, "Satellite Management Program," "Satellite Management," and "Impacts of Engrossed Second Substitute Senate Bill . . . on Satellite Management of Public Water Systems."

Training and Technical Assistance

The SDWA provides new resources for capacity development efforts by outside organizations. These tools are likely to play a vital role in capacity development strategies. One common theme in systems that lack adequate capacity is a lack of trained, professional personnel to operate and manage the system. Training and technical assistance can remedy that deficiency. These tools also can be used to educate and persuade system owners and operators to adopt practices and methods that will enhance capacity and reliability.

Examples of Using the Tool as Part of a Capacity Development Strategy

Training and technical assistance can be an important part of a State capacity development strategy.

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** Training and technical assistance providers could be one source of information in prioritization. Systems that need training or technical assistance but have not sought out that assistance are probably those most in need of improving technical, managerial, and financial capacity.
- ***To assist public water systems in complying with national primary drinking water regulations; encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity; and assist public water systems in training, certification, and continuing education of operators.*** Training and technical assistance providers can be important assets in the development of this aspect of a strategy, particularly with respect to training, certification, and continuing education.

Examples of Use of the Tool as a Means of Assessing Capacity

There are a wide variety of providers of training and technical assistance. These include:

Rural Community Action Project (RCAP) and their regional affiliates,

National Rural Water Association (NRWA) and their State associations,

American Water Works Association (AWWA) and their State sections,

State drinking water regulatory agencies that may also provide training and technical assistance to facilitate compliance,

Other State agencies designed to help small entities—e.g., departments of commerce or community affairs,

State public utility commissions,

International City Managers Association (ICMA), and

National Environmental Training Association (NETA).

Sources of Additional Information

For more information on training and technical assistance providers see:

National Training Coalition, "Final Report on Training Needs and Providers," July 1997.

You can obtain more information by calling the Association of State Drinking Water Administrators at 202-293-7655, RCAP-Community Resource Group at 501-443-2700, the National Rural Water Association at 405-252-0629, or the American Water Works Association at 303-799-7711.

Coordination with Other Agencies

Effective design and implementation of capacity development strategies requires the coordination of a large number of governmental agencies. At the State level, these may include the State SDWA primacy agency, the public utility commission (PUC), the SRF development financing agency, and the water resources management agency. In some States, several of these may be authorized by a single statute and be in the same overall agency. In other States, there may be substantial fragmentation.

Public utility commissions (PUCs) play an important role in the regulation and oversight of public water systems in many States. While the jurisdiction of PUCs varies from State to State, the commissions often regulate investor-owned utilities and a variety of other non-investor-owned utilities. PUC approvals also may be required for extensions of service from existing investor owned systems to new developments outside the original franchise area, or from municipal water systems to new developments outside the municipal boundaries. These statutory authorities make PUCs logical partners in capacity development strategies. Several state commissions have adopted more expanded roles in small water system capacity by means of: 1) opening a formal proceeding on the matter and requesting public comment; 2) developing and issuing a new policy statement adopted by the commissioners; and 3) entering into Memoranda of Understanding with other agencies stating the broad objectives of small system capacity development and itemizing specific commission responsibilities.

The State financing agency, if different from the primacy agency, also is an important actor. This agency will administer grant and loan programs that can provide incentives for capacity development efforts. Establishing coordination between the primacy agency and the financing agency is an essential part of a capacity development strategy.

The State agency responsible for administering water supplies through water rights or user permits is likely to have data on water allocations that are necessary for evaluating the supply options in an area. Similarly, a State's water quality agency will have some data on the quality of those surface or ground water supplies to assess whether treatment costs or contamination problems may be associated with a particular supply alternative. University geology departments, or federal agencies such as the U.S. Geological Survey or the Army Corps of Engineers, may for certain areas in a State have done studies that include either or both types of useful information.

At the sub-State level, the primacy agency must coordinate with all regional, county, and municipal governments that may play a role in capacity development. Agencies concerned with land use development, land use planning, and growth management are likely candidates for

coordination in an effort to develop a State-wide effort to ensure that systems with adequate capacity serve all new residential and commercial development. In most States, primary responsibility for land use planning is a sub-State responsibility, performed by municipal governments, county governments, or regional planning agencies.

Coordination between agencies usually is accomplished through memoranda of understanding. These could be implemented in several different ways.

- Primacy agencies and PUCs could jointly issue renewable operating permits. The primacy agency could focus on technical areas where it has strong engineering and operations expertise, while the PUC could focus on financial areas where it has special expertise. Together, the two agencies could perform a more thorough development assessment than either agency could perform
- The memoranda of understanding could include both the PUC and the State financing agency, thereby ensuring that prospective use of grant and loan funds are reviewed by both the primacy agency and the PUC.
- Primacy agencies could sub-contract assessment of public water systems' financial capacity to PUCs or the State financing agency, thereby bringing the expertise of these other agencies to bear on this critical element of capacity assessment.

Examples of Using the Tool as Part of a Capacity Development Strategy

Coordination with other agencies can be used in the following ways to assist in the development and implementation of a State capacity development strategy.

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** Coordinating with all other agencies that routinely assess capacity of water systems would improve the ability of the primacy agency to prioritize systems.
- ***To identify factors that encourage or impair capacity development.*** Coordination with other, relevant agencies encourages capacity development, and absence of coordination will impair the implementation of a capacity development strategy.

- ***To establish a baseline and measure improvements in capacity.*** Creation of coordination with other agencies, particularly through memoranda of understanding, would be one indication of improvement in the State program.
- ***To identify stakeholders who have an interest in or are involved in the preparation and implementation of the capacity development strategy.*** The other agencies described above are essential to implementation of the strategy.

Examples of Use of the Tool as a Means of Assessing Capacity

Coordination with other agencies is an important procedural step for accurate assessment of the technical, financial, and managerial capacity of systems. As demonstrated throughout this document, each of these agencies may have a unique perspective on technical expertise that would not be available from the primacy agency alone. For example:

- PUCs have information on financial aspects of the capacity of systems that they regulate. Their staff also include professionals who are trained to assess financial capacity—a type of expertise that may not be found in the primacy agency.
- State financing agencies have a unique database comprised of applications for grants and loans, plus agency evaluation of the capacity of systems making these applications. Also, like PUCs, financing agencies have trained professionals who are expert in assessment of financial capacity.

Sources of Additional Information

For more information on coordination with other agencies see:

A Guidebook of Financial Tools. Environmental Finance Program.

This document is available through the EPA home page. You can access this document at www.epa.gov/efinpage/guidebk/guindex.htm.

Source Water Assessment Programs

Section 1453 of the SDWA Amendments of 1996 contain provisions for State Source Water Assessment Programs. Source water and capacity development have two fundamental links. One link is to the DWSRF, which allows States to set funds for prevention activities. The Amendments require the States to prepare the source water assessment program and capacity development strategy once. States need to be sure that the actions they propose are those necessary to equip them to make the link to the DWSRF and the other SDWA requirements work.

The second link is to public participation. A consistent theme in the Amendments is for States to have both flexibility and resources in adjusting programs to meet State needs, especially in the prevention area, and the obligation for public information and involvement to ensure that States' choices respond to their constituents' needs and conditions.

The capabilities States can develop in their capacity development strategies are essential to make other parts of the SDWA work. Like source water protection, achieving increased capacity through improved management of the water resources and/or physical infrastructure, can head off compliance problems that will cost far more to fix than the cost of the management improvements. The Amendments also require States to make decisions on whether restructuring and water supply alternatives are affordable for small systems that apply for variances and exemptions. To make these decisions States will need an information base and analytic methods for water and system management, both of which States can build into framing their capacity development strategies. These tools are equally valuable for evaluating the problems of systems in noncompliance, and for targeting technical assistance to systems that require the most help.

Wellhead Protection Programs (for ground water) and Watershed Control (or Protection) Programs (for surface water) are types of source water assessment programs that many States have implemented for years. Wellhead Protection Programs can include requirements that a public water system determine the susceptibility of its source water(s) to surface activities; delineate wellhead protection area(s); inventory for potential contaminant sources; notify owners/operators/regulators/land use planners/emergency responders of the findings; and develop contingency plans in the event of a contamination incident.

Examples of Using the Tool as Part of a Capacity Development Strategy

Source water protection can be used in the following ways to assist in the development and implementation of a State capacity development strategy.

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** Source water protection programs can provide useful information on potential sources of contamination that could help in prioritization.
- ***To assist public water systems in complying with national primary drinking water regulations; and encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity.*** Source water protection, encouraged by the 1996 Amendments to SDWA, assists in both of these efforts.
- ***To establish a baseline and measure improvements in capacity.*** Given the potential importance of source water protection and its links to capacity development, one measure of improvement in capacity development could be the extent to which the State and its systems have implemented source water protection.

Examples of Use of the Tool as a Means of Assessing Capacity

Developing a sound source water protection or wellhead protection program involves all three components of capacity: the technical ability to determine hydrogeologic data, the management skills to develop and implement the plan; and also the financial capacity for financing any needed facilities or activities. The presence of a source water protection program or wellhead protection program therefore can help States to assess these aspects of system capacity.

Similarly, developing a watershed control program requires all three components of capacity: the technical ability to determine watershed data, the management skills to develop and implement the plan, and also to financial capacity for financing any needed facilities or activities.

Sources of Additional Information

For more information on source water assessment programs, wellhead protection programs and watershed protection programs, see:

U.S. Environmental Protection Agency. "State Source Water Assessment and Protection Programs Guidance" EPA Document # 816-R-97-007, April 1997.

Washington State's Department of Health has an administrative mandate for requiring watershed control programs (WAC 246-290-135) and provides guidance in the "Water System Planning Handbook."

Washington State has also mandated wellhead protection programs for ground water systems (WAC 246-290-135A). The State has a guidance document available, *Washington State Wellhead Protection Program Guidance Document*, April 1995.

Water Conservation Plans

Some States use Water Conservation Plans to help boost water systems' technical capacity, as well as the systems' managerial and financial capacity. Typically, these plans include three components:

- **water conservation program:** various conservation measures are evaluated and those that are cost effective are scheduled for implementation (description, budget, monitoring program, etc.);
- **water demand forecasting:** systems are required to forecast 6- and 20-year water demands considering projected population, historic water use, land use, projected conservation savings, and other appropriate factors; and
- **water use data collection and reporting:** various parameters of water use are required to be collected and reported to the State annually.

Requirements for water conservation plans will vary, depending upon the size of the water system. The larger the system the more detailed and complex the requirements.

Examples of Using the Tool as Part of a Capacity Development Strategy

Conservation plans can be used in the following ways to assist in the development and implementation of a State capacity development strategy.

- ***To encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity.*** Existence of conservation programs, particularly those that require long-term forecasting of water demands, could facilitate partnerships between water systems to deal with water quantity issues.
- ***To establish a baseline and measure improvements in capacity.*** For those States where water quantity is an important public policy issue, implementation of water conservation plans can be used to measure improvements in capacity.

Examples of Use of the Tool as a Means of Assessing Capacity

Conservation plans also can be used to assess the technical, financial, and managerial capacity of water systems. Each of the three components of capacity (technical, managerial and financial) are related and addressed in various sections of a water conservation plan. Knowing future water demands and current water usage provide a technical basis for making managerial decisions to ensure adequate physical capacity. Knowing when additional system component capacity will be needed based upon projected water conservation savings and water demand forecasts will enable sound financial decisions related to needed system expansions and improvements.

Sources of Additional Information

Washington requires water conservation plans under RCW 43.20.230, 43.70.310, and WAC 246-290-100. Additional authorities from the Department of Ecology related to water conservation are found in RCW 43.27A.090, 90.03.005, 90.54.020, and 90.54.180. DOH and Ecology's "Water Conservation Planning Requirements" provide detailed guidelines and requirements for water conservation for public water systems.

Readers may wish to cross-reference water conservation plans with other tools, specifically the water supply plan or business plan. Some States require that water conservation plans be included with other planning documents.

Emergency Response Plans

One element of capacity development is the development of an Emergency Response Plan that will define how systems will respond to emergency situations. These plans cover "routine" emergencies as well as "disaster" emergencies. The plan lists procedures a system should follow when emergencies occur. The concept is for the system to develop the capacity to handle routine emergencies so if a disaster emergency occurs, the system will be better capable of protecting public health.

Examples of Use of the Tool as a Means of Assessing Capacity

- **To assess the technical, financial, and managerial capacity of water systems.**
Identifying how a system will respond to routine and disaster emergencies could apply to all aspects of capacity—technical, managerial, and financial. For purposes of assessing capacity of systems, however, the tool probably is most applicable to technical capacity, particularly technical knowledge and infrastructure adequacy. Secondly, the tool could be applied to assessments of managerial capacity for the element of staffing and organization.

Sources of Additional Information

Washington State requires an emergency response plan as an element of a system's Water System Plan. Washington State Department of Health, "Planning Handbook: A Guide for Preparing Water System Plans," August 23, 1993.

National Rural Water Association, "Emergency Response Manual for Small Systems."

For more information on emergency-response plans, the National Rural Water Association at 405-252-0629, or the American Water Works Association at 303-799-7711.

Certificates of Convenience and Necessity (CCNs)

A CCN is a license that allows certain public utilities to operate as regulated monopolies within a defined area. The focus of review before granting or transferring CCN's is to assess the utility's ability to provide continuous and adequate service. This may involve a review of the utility's debt/equity ratio, ability to provide continuous service, the feasibility of obtaining service from another utility, the effect on the consumers of granting the CCN and other technical, managerial and financial capabilities.

Investor-owned utilities, water supply corporations and border counties are required to obtain a CCN. Cities and districts must obtain a CCN only if they wish to serve in an area lawfully served by another utility. The order to grant, amend, or transfer a CCN may include requirements to improve the utility's ability to provide continuous service. The orders are monitored for compliance. If a utility is being transferred, the new owner must State in the application how the facilities will be maintained or improved to meet minimum State standards.

Examples of Using the Tool as Part of a Capacity Development Strategy

A CCN is one of the important control points that permit State agencies to ensure system capacity. As such, it can be used in the following ways to assist in the development and implementation of a State capacity development strategy.

- ***To assist public water systems in complying with national primary drinking water regulations; and encourage the development of partnerships between public water systems to enhance technical, managerial, and financial capacity.*** The availability of a CCN requirement is one method that States can use to assist systems in maintaining compliance. Also, the nature of the CCN review process, particularly since it permits other nearby systems to comment on the application for renewal of a CCN, can assist in the development of partnerships between water systems.
- ***To identify stakeholders who have an interest in or are involved in the preparation and implementation of the capacity development strategy.*** The process for issuance or renewal of a CCN provides explicit procedures for involving water system customers in the process. PUCs that issue or renew CCNs could assist State primacy agencies in the identification of stakeholders.

Examples of Use of the Tool as a Means of Assessing Capacity

The process for issuance or renewal of a CCN involves an assessment of the capacity of the system applying for the CCN. It therefore can be used to supplement the primacy agency's assessment of the technical, financial, and managerial capacity of water systems.

- ***To assess technical capacity:*** The review of an application for a CCN considers the sanitary survey and possibly an on-site inspection of the facilities. Deficiencies noted on the sanitary survey are addressed. The utility may be ordered to correct deficiencies before awarding the CCN. In the CCN application, the utility typically must verify the availability of a certified operator for the system.

The application to transfer a CCN requests information on the utility's physical capacity to provide adequate water service. If the demand for water has reached at least 85% of the utility's physical capacity, the applicant must submit a plan to increase its capacity or otherwise ensure continuous and adequate water service.

- ***To assess managerial capacity:*** The CCN application and the application to transfer a CCN requests information on the owner or governing board, including the owner's experience and qualifications to manage the utility. The procedure to obtain or transfer a CCN ensures that customers are notified of the new service or the transfer in ownership. Any objections to the new utility or change in ownership are resolved during the process.
- ***To assess financial capacity:*** The CCN application and the application to transfer a CCN requests information on the rates, the existing debt of the utility, and how the utility will be funded in the future. Investor-owned utilities must provide information on the purchase price and rate base of the utility. The utility is given notice that it will be responsible for supporting the amount of the original cost in a rate proceeding.

Sources of Additional Information

NARUC, Annual Report on Utility and Carrier Regulation, Washington, DC.

Beecher, Janice. *1995 Inventory of Commissions of Regulated Water and Wastewater Utilities*, Indianapolis Center for Urban Policy and the Environment.

Review of Audit Reports

Some States require that utilities submit an annual audit report to the State for review. One rationale for this requirement is that States have oversight responsibility for political subdivisions that may issue municipal bonds and levy taxes. This oversight responsibility requires audit information. The State may require supplemental information to be included with the audit report to assist the State in evaluating the water system's capacity.

Examples of Using the Tool as Part of a Capacity Development Strategy

A review of audit reports can be used in the following way to assist in the development and implementation of a State capacity development strategy.

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** As with many other types of financial reviews conducted by State agencies, the review of audit reports provides additional information about these systems. This information can be used to supplement information routinely available to primacy agencies as they establish priorities.

Examples of Use of the Tool as a Means of Assessing Capacity

A review of audit reports can be used in the following ways to assess the technical, financial, and managerial capacity of water systems.

- ***To assess managerial capacity:*** The Auditor's management letter submitted with the annual audit report discloses the results of the auditor's review of internal controls. If internal controls are deficient, or basic record keeping standards are not being met, the independent auditor will note the deficiency in the management letter. The independent auditor will also evaluate personnel policies and the billing and collection procedures.

All systems covered by the audit requirement are required by generally accepted accounting standards to include a budget with their general purpose financial statements. The budget must include a comparison between the budget and actual operating results.

The independent auditor must also disclose significant non-compliance with the rules and regulations that apply to water systems.

- ***To assess financial capacity:*** The annual audit report is analyzed to ensure its rates, charges and revenues are sufficient to cover debt service and operating expenditures. If a bankruptcy application is filed, then the audit report is reviewed in terms of the necessity for bankruptcy and potential avenues of recourse that the system has not pursued.

The supplemental schedules submitted with the annual audit report include information on rates, investments, insurance, and contact information on the governing board. The schedules for current and future debt service payments are included, as well as the historical trends in the assessed valuation of property and property taxes. A five-year comparative operating statement is provided with total water pumped versus total water billed to customers.

Sources of Additional Information

For more information on audit reports, see:

Texas Natural Resource Conservation Commission, "Annual Audit Report Requirements for Texas Districts and Authorities."

Bond Issue Reviews

Some States require publicly owned water systems to obtain State regulatory approval before issuing general obligation bonds. The bond approval process includes an engineering review of the facilities to be purchased with the bond proceeds and a financial review of the feasibility of the system to make the debt service payments. Like the audit report (discussed above), this review reflects the State's responsibility to ensure that political subdivisions with taxing authority act responsibly when incurring debt.

Examples of Using the Tool as Part of a Capacity Development Strategy

Bond issue reviews can be used in the following ways to assist in the development and implementation of a State capacity development strategy.

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** As with the review of audit reports, bond issue reviews provide additional information about these systems. This information can be used to supplement information routinely available to primacy agencies as they establish priorities.

Examples of Use of the Tool as a Means of Assessing Capacity

Bond issue reviews can be used in the following ways to assess the technical, financial, and managerial capacity of water systems.

- ***To assess technical capacity:*** The application for bond approvals includes an engineering report which explains why the technology for the infrastructure was selected. The engineering report provides a justification for the facility costs included in the bond issue, including redundant facilities and other engineered components of the system.

The engineering review of the proposed bond issue ensures that the infrastructure is appropriate for the development, that professional engineering standards are maintained, and that the costs are appropriately allocated between private and public interests.

- ***To assess managerial capacity:*** The application for approval of a bond issue includes various resolutions of the governing board of the system to indicate that the board has reviewed and approved the application and the terms of the bond issue. The consultants working for the system have a professional obligation to explain to the board the applicable regulations and obligations of their office.
- ***To assess financial capacity:*** The financial review of a bond issue analyzes the potential tax revenues for the development based on current and future assessed valuations of the property over the life of the bonds, usually a 20-year period. The tax revenues must be sufficient to cover debt service payments and maintain a specified level of reserve. Tax increases may be limited by State statutory limits on indebtedness by political subdivisions.

Sources of Additional Information

NARUC, Annual Report on Utility and Carrier Regulation, Washington, DC.

Beecher, Janice. *1995 Inventory of Commissions of Regulated Water and Wastewater Utilities*, Indianapolis Center for Urban Policy and the Environment.

Credit Rating Services

There are several different credit rating services. These institutions rate the credit-worthiness of different types of public water systems. Two institutions, Standard & Poor's and Moody's, rate the credit of some public water systems that have issued bonds. (Not all systems that issue bonds are rated.) Both publicly owned and privately owned systems are included in these ratings. Dun & Bradstreet, another credit rating service, issues reports on the credit-worthiness of millions of investor-owned businesses. All of these services use a variety of financial ratios to compare the financial condition of the entity being rated with comparable publicly owned or privately owned entities. Dun & Bradstreet also uses a history of accounts payable to assess whether the entity promptly pays its vendors.

Many small public water systems do not have the type of financial history that is required to obtain a credit rating from institutions like Moody's, Standard & Poor's, or Dun & Bradstreet. This generally is a reflection on their small size. Inability to get a credit rating from these services is not a good indicator of capacity for very small systems.

Examples of Use of the Tool as a Means of Assessing Capacity

All of the credit rating services focus primarily on an evaluation of the financial condition of water systems. Therefore, they are most useful in assessing the financial capacity of systems. It is likely that most small systems will not be rated by any of these services. Nevertheless, the procedures and techniques used by the services may provide some insights to States as they develop methods for assessing financial capacity.

- ***To assess financial capacity.*** The credit rating services described above provide insights into variables that are of most interest to creditors. The bond rating services focus primarily on variables that are related to the ability of a water system to establish and maintain a revenue stream that will repay the institutions that purchased the bonds. Dun & Bradstreet, in contrast, is more interested in day-to-day credit worthiness, e.g., the ability of a system to pay its vendors. The type of analysis used by Dun & Bradstreet is particularly useful for the smallest systems that are unlikely to ever issue debt instruments.

Sources of Additional Information

For more information on credit rating services see:

AWWA Research Foundation, "Meeting Future Financial Needs of Water Utilities."

Financial Assurance Mechanisms

Several States have authority to require that system owners provide some form of financial assurance prior to construction of a new water system or expansion of an existing system. While the types of financial assurance mechanisms vary from State to State, the intent generally is the same: to ensure that sufficient funds are available to repair and/or operate the system in the event that the owner is unable to do so. Typically, these requirements are more often imposed on small, privately owned systems.

Examples of the types of financial assurance mechanisms that might be required include:

- Escrow accounts (Maryland),
- An emergency reserve account to cover the cost of emergency or system component failure (Washington),
- Surety bonds (North Carolina),
- Letters of credit,
- Trust funds, or
- Financial tests (e.g., an analysis of financial statements that demonstrates the financial health of the water system)

Examples of Using the Tool as Part of a Capacity Development Strategy

Financial assurance mechanisms can be used in the following ways to assist in the development and implementation of a State capacity development strategy.

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** Systems that already have requirements for financial assurance mechanisms might be candidates for higher priority.

- ***To identify factors that encourage or impair capacity development.*** Legal authority to require financial assurance mechanisms may be one factor that encourages (or has encouraged) the development of system capacity.

Examples of Use of the Tool as a Means of Assessing Capacity

- ***To assess financial capacity.*** These financial assurance mechanisms are a quick test of system capacity. Put simply, if the system cannot afford one of these financial assurance mechanisms, then it may not have the financial capacity to provide safe drinking water.

Sources of Additional Information

For more information on credit rating services see:

U.S. Environmental Protection Agency, "Ensuring the Viability of New, Small Drinking Water Systems: A Study of State Programs," EPA-570/9-89-004, April 1989.

Consumer Confidence Reports

Section 1414(c)(4) of the Amendments to the SDWA requires that all community water systems inform all of their customers about the levels of contaminants in the drinking water provided by that system. Systems serving more than 10,000 persons are required to inform their customers by mail. The Governor of a State may allow systems serving fewer than 10,000 persons to inform their customers through notice in newspapers plus making the report available upon request.

Examples of Use of the Tool as a Means of Assessing Capacity

The consumer confidence reports discuss both technical and managerial capacity. Their results could be used by States in an effort to assess capacity.

- **Technical capacity.** The levels of contaminants in finished water provided to customers certainly reflects on the adequacy of source water (from a qualitative standpoint). It also reflects infrastructure capacity and technical knowledge. Weaknesses in each of these elements could contribute to levels of contaminants that exceed standards.
- **Managerial capacity.** The levels of contaminants in finished water also could reflect problems with the management of a system. From the standpoint of capacity development, the existence of contaminant levels that exceed standards is most likely linked to the staffing and organization element of managerial capacity.

Sources of Additional Information

For more information on consumer confidence reports see:

The Nov. 8, 1996 "Water Quality Reports Update" on Consumer Confidence Reports.

This document is available on the Internet from the American Water Works Association home page. You can access this document at www.awwa.org/ccrupdat.htm

"Consumer Confidence Reports: Opportunity's Knocking." *Journal of the American Water Works Association*. (Apr. 1997): 12.

Two recommended AWWA examples of Consumer Confidence Reports are available on the Internet for Davis, CA and Denver, CO. These documents can be accessed at:

www.city.davis.ca.us/city/pworks/wqrept95.htm

www.water.denver.co.gov/dwbwq96.htm

A more complete listing of utilities with Consumer Confidence Reports is also available from AWWA and can be accessed at www.awwa.org/utility.htm.

Enforcement

Many States consider enforcement a tool that can be used for improving system capacity. As one State representative put it, "this is the last tool in the toolbox." In other words, enforcement (or the threat of enforcement) can assist in capacity building.

Compliance assurance programs also may involve a number of activities that are not strictly enforcement. In Massachusetts, for example, the Division of Water Supply has several "tools" that can be used to promote compliance. These include:

- A database on system compliance status,
- A comprehensive training program for all public water systems,
- Training for third parties such as consultants and laboratory staff,
- CCPs and optimization surveys,
- Water system awards, and
- A PWS mentoring program.

Examples of Using the Tool as Part of a Capacity Development Strategy

Enforcement can be used in the following way to assist in the development and implementation of a State capacity development strategy.

- *To assist public water systems in complying with national primary drinking water regulations.* Enforcement is one tool that can be used (as a last resort) to ensure that systems are complying with the national primary drinking water standards.

Sources of Additional Information

For more information on enforcement, see:

"In the Main." Massachusetts Division of Water Supply. Spring 1996.

"Enforcement Program." Washington Division of Drinking Water.

This document is available on the Internet at 198.187.0.42/ehp/dw/dwenf.htm.

State or Federal Surveys of Infrastructure Needs

Several States (e.g., Washington, Pennsylvania, Oregon, and New York) conducted surveys of infrastructure needs during the first half of this decade. In 1995, EPA began the first national survey of infrastructure needs, and all States participated in this effort to survey a national probability sample of community water systems. In 1999, EPA will conduct a second national survey of infrastructure needs, as required by Section 1452 of the Act. One limitation of the EPA survey is that it was limited to community water systems. Some States, however, also included noncommunity systems' needs.

Examples of Using the Tool as Part of a Capacity Development Strategy

- ***To prioritize systems most in need of improving technical, managerial, and financial capacity.*** Federal or State Surveys of infrastructure needs could be used to prioritize systems in need of assistance in capacity development. Indeed, a capacity development strategy might prioritize its activities toward systems that had a large backlog of unfunded infrastructure needs. In this way, these surveys could assist in the development and implementation of a State's capacity development strategy.

Sources of Additional Information

For more information on surveys of infrastructure needs, see:

U.S. Environmental Protection Agency, *Drinking Water Infrastructure Needs Survey: First Report to Congress*, January 1997, EPA 812-R-97-001.

Interviews with Personnel Familiar with the Systems

States should not overlook the obvious step of talking with individuals who are familiar with the system.

Examples of Use of the Tool as a Means of Assessing Capacity

In assessing capacity for the purposes of SRF decisions, States could obtain valuable information from the following sources:

- ***Sanitarians, engineers, or regulatory staff at the State, county, or local level who are familiar with the system.*** These individuals often know the inner-workings of the system, the system owners or operators, and the problems faced by the system. They may have files on the system in their desks. These individuals can offer information that is not contained in the standard tools discussed above, or they can help answer questions that may arise in the review of the other documents.
- ***Local planning boards, operator certification boards, or developers' associations.*** These individuals may also have information on the specific system, as well as general information on system capacity in the area.
- ***Technical assistance personnel.*** Circuit riders or other technical assistant staff often possess a firm understanding of a system (sometimes better than the operator's) and are able to offer information about a system's capacity or answer State questions. In some cases, the State will want to seek confirmation of the information provided by technical assistance staff.
- ***Staff at the system itself.*** Interviews with the system owners or operators would also help the State review capacity. States could use this opportunity to perform a mini capacity assessment using tools such as the Dozen Questions, sanitary survey procedures, or CPE interview guides.

