NRRI 99-10

WATER CAPACITY DEVELOPMENT AND PLANNING: A BENCHMARKING GUIDE FOR REGULATORY COMMISSIONS

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July 1999

This report was prepared by The National Regulatory Research Institute (NRRI). Funding was provided by the member commissions of the National Association of Regulatory Utilities Commissioners (NARUC). The opinions expressed herein are the author's and do not necessarily reflect the views, opinions, or policies of the NRRI, the NARUC, or any NARUC member commission.

EXECUTIVE SUMMARY

The 1996 Amendments to the Safe Drinking Water Act (SDWA) extend the authority of the U.S. Environmental Protection Agency (U.S. EPA) beyond the realm of pure environmental regulation and into the financial, managerial, and technical "capacity" of drinking water utilities. The capacity development requirements are designed to halt the proliferation of service provision by suppliers with doubtful longer-term prospects and to strengthen the capabilities of existing suppliers. The requirements of the amended SDWA affect state primacy agencies and others, including state regulatory commissions. The federal legislation vests regulators with a set of potentially useful tools to analyze and promote the capabilities of proposed, new, and established suppliers of drinking water to meet customer needs. This report provides a benchmark that allows a commission to assess its present position relative to the capacity and capacity development criteria of the 1996 federal law. It also presents the results of an NRRI analysis of state commission water rules.

The concept of capacity invokes a systems orientation for new and existing water utilities. This approach acknowledges the significant components of the system and stresses the importance of their interaction and contribution to the success of the system as a whole. A three-tiered conceptual model for water system capacity, as called for by the U.S. EPA, is presented in this report and organized around the three goals of financial capacity, managerial capacity, and technical capacity. Successful systems are those that are able to satisfy each capacity goal singularly and all of the capacity goals in combination. Each of the three goals is further refined into a set of objectives that are designed to achieve the related goal. The conceptual model for drinking water system capacity is operationalized through specification and definition of a set of indicator variables for each of the objectives.

The report presents the results of an NRRI analysis of state commission water rules. The study looked specifically for indicators of capacity planning and capacity development. The results provide a "snapshot" view of state capacity provisions reflected in water rules, since these mechanisms and policies are evolving in response to the requirements of the 1996 Act and to individual state conditions. The aggregate findings indicate that, in general, commission water rules address many (but not all) of the capacity considerations in the 1996 Act and its implementation guidelines. At a minimum, commissions can use this information as a benchmarking tool for evaluating and reviewing their own rules. It could also stimulate consideration of commission responsibilities under the SDWA that are not currently present or fully addressed in their rules, practices, policies, or procedures. (Of course, rules are not the only indicator of commission authority.) Questions to be raised include:

- Are all three capacity goals equally important, or are some more important than others? All nine capacity objectives? All 37 capacity indicators?
- Is there an optimum mix or synthesis between and among the goals, and if so, what is it? Among the objectives? Among the indicators?
- Are all of the important capacity goals present in the conceptual model, and have they been sufficiently operationalized in the capacity framework? All the important capacity objectives?
- Do the indicator variables in the operationalized framework constitute a necessary and sufficient set of measures of a drinking water system's capacity or ability to develop capacity?
- Is a rules-based approach to drinking water quality that mandates capacity and capacity development more likely to achieve the desired results than alternate regulatory strategies?

U.S. EPA guidelines suggest that commissions are the "control points" for ensuring certain elements of a new or proposed drinking water system's capacity development.[1] However, the guidelines present a limited set of responsibility areas for commissions. Whereas commissions are vested with the authority for economic regulation, the U.S. EPA does not identify them as control points for many of the financial indicators in the capacity framework.[2] Additionally, it is not clear where the authority and subsequent control points exist for those financial indicators that are not assigned to state commissions, since these relationships are not fully articulated in the U.S. EPA guidelines. Furthermore, a compelling case can be made that commissions are not only responsible for, but have jurisdiction over, many of the other areas captured by indicators that fall under the headings of both technical and managerial capacity. Finally, it is not clear what level and scope of inter-agency communication and coordination need to exist to properly address the variables for which commissions are identified as control points for new systems.

Clarification and communication among commissions and other federal and state agencies responsible for capacity planning are clearly needed. Ultimately, the success of the capacity concept may very well depend as much on successful interagency coordination and communication as it does on the unilateral implementation of assigned tasks. Commissions may wish to consider which, if any, of the financial, technical, and managerial indicators play an integral role in meeting their traditional responsibilities, which indicators now require attention as mandated by the SDWA, and what level of communication and coordination needs to occur with other agencies on these issues.

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[1] The current control point discussions are limited to capacity development considerations for new or proposed systems. Control points for existing systems have not yet been forwarded by the U.S. EPA. It is likely, however, that a similar concept will emerge for existing systems in future U.S. EPA guidelines.

[2] The authority of the commissions is, of course, generally limited to privately owned utilities. The U.S. EPA's "control points" do not extend the role or authority of Commissions into nonjurisdictional utilities.

In summary, commissions may want to customize their own indicator taxonomy using, but not being limited by, the information provided by U.S. EPA and this report. A customized framework might add some indicators not present here, delete others, and provide differentiation with respect to their importance in achieving the goals and objectives identified by the commission. The development and implementation of a uniform state-specific framework and policy for all jurisdictional water utilities might simplify and streamline commission procedures, reduce uncertainty for regulated utilities, improve customer satisfaction, and enhance the provision of safe drinking water. Additionally, future U.S. EPA guidelines are likely to extend the lessons learned in designing and implementing capacity development programs for new and proposed systems into the arena of existing systems. Commissions may find it useful and productive to communicate their capacity development experiences to state primacy agencies and the U.S. EPA. This communication will serve to better inform the next generation of capacity initiatives.

There are undoubtedly many other questions and policy implications that may arise as a result of the information presented here. At a minimum, it is hoped that this data and analysis will further the discourse and development necessary for commissions to successfully design and implement the requirements for capacity planning and development.

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FOREWORD

Amendments to the Safe Drinking Water Act in 1996 expand the policy reach of the U.S. Environmental Protection Agency into areas where state regulators have direct policy concerns and legal jurisdiction. SDWA requirements for developing the technical, managerial, and financial capacity of new and existing water utilities present a challenge and an opportunity for commissions and environmental agencies. This report provides a valuable benchmark for commission action to assess and develop the capacity of jurisdictional utilities to serve their customers.

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July 1999

ACKNOWLEDGMENTS

The author wishes to thank a number of individuals who contributed to this report. This report could not have been written without the contributions of the many individuals at state commissions who provided information regarding their water rules. John Borrows, A Research Specialist at NRRI, Vivian Witkind Davis, NRRI's Associate Director for Telecommunications and Water, and NRRI Director Ray Lawton provided a number of insights that improved the report. Linda Schmidt prepared the final copy of the report, and her efforts are greatly appreciated.

Introduction

The Safe Drinking Water Act (SDWA) is the principal federal legislation governing the provision of drinking water in the United States. The initial law was enacted in 1974 (P.L. 93-523). The primary purpose of the Act was to establish comprehensive national standards for safe drinking water in order to ensure and protect public health. The 1974 Act set in motion a standards-based approach to regulating contaminants, both chemical and microbiological, in drinking water. The Act also mandated a multi-tiered approach to regulation that identified responsibilities for federal and state governments and for drinking water utilities. The SDWA has been amended numerous times since its inception in 1974. What has evolved is a tradition of standards and rules covering an increasing number of contaminants, stricter limits on contaminant concentrations, specification of treatment technologies, and monitoring and reporting requirements.

Amendments to the SDWA in 1996 made significant changes that affect all state regulatory commissions with jurisdiction over water utilities. President Clinton's remarks at the signing of the Act reflect the lofty goals for its impact:

> Today we helped to ensure that every family in America will have safe, clean drinking water to drink every time they turn on a faucet or stop at a public fountain. From now on our water will be safer and our country will be healthier for it.[3]

Whether universally safe and clean water is possible across the broad spectrum of consumers and conditions that exist in the United States is certainly debatable. What is not at question, however, is the federal government's continued commitment to improve public health through the regulation of drinking water. One advance and

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[3] Bill Clinton, Remarks By the President At Bill Signing Of The Safe Drinking Water Act Amendments of 1996.

departure from traditional practice that arises from the SDWA as amended is a new policy orientation that goes beyond the contaminant-technology-monitoring and reporting scheme. The 1996 Amendments establish requirements for a programmatic focus on the "capacity" of drinking water utilities to comply with applicable drinking water standards. This new approach stresses the important role that the "health" and competency exhibited by individual drinking water utilities plays in their ability to be reliable and safe providers of such a vitally important product.

Administratively, the SDWA's multi-tiered approach towards assigning responsibilities for various design, implementation, and monitoring activities is maintained in the 1996 Amendments with respect to the capacity and capacity development provisions. While the majority of the requirements mandated by the latest amendments fall into the domain of state primacy agencies, there are also clear implications for state regulatory commissions and the drinking water utilities they regulate. Gaining an understanding of the nature and extent of the requirements should help commissions tailor effective programs within their jurisdictions. Additionally, identifying and utilizing efficient channels of communication and coordination with other agencies involved in the process will be an important part of both the initial and sustained capacity effort.

This report is designed to provide insight to public utility regulators regarding the new capacity development provisions of the SDWA. The report includes an overview and conceptual model of drinking water system capacity, an analytical framework with numerous indicators of capacity, an analysis of capacity development provisions currently reflected in commission water rules, and some recommendations and suggestions for regulators. Additionally, examples from two state capacity development programs are included.

Water System Capacity and Capacity Development

The 1996 Amendments to the SDWA formally recognize the link between safe drinking water and the protection of public health. Developing the capacity of new or proposed systems to achieve compliance with applicable standards and ensuring the continued capacity of existing systems to provide safe drinking water is seen as an integral and fundamental component of the provision and protection of public health in the United States. The Act requires, therefore, that state-level programs be designed and implemented to insure that drinking water systems develop the capacity to provide safe drinking water to their customers. It is expected, however, that the mandated requirements may exceed the capabilities of some public water systems (especially small systems) to provide safe drinking water and quality services.[4] To this end, the SDWA requires the United States Environmental Protection Agency (U.S. EPA) to develop implementation guidelines for states. The purpose of the guidelines is to assist the states with designing and implementing strategies and assessment techniques for drinking water systems' capacity development.[5] The U.S. EPA guidelines provide the following definitions:[6]

> **Water system capacity** refers to a water system's ability to consistently provide safe drinking water for its customers. To do that, a system must have the technical abilities, managerial skills, and financial resources to meet state and federal drinking water regulations. Technical, managerial, and financial capacity are individual yet highly interrelated dimensions of capacity.

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[4] In the SDWA Congress "finds that . . . . (1) safe drinking water is essential to the protection of public health; (2) because the requirements of the Safe Drinking Water Act (42 U.S.C. 300cf et seq.) now exceed the financial and technical capacity of some public water systems, especially small public water systems, the Federal Government needs to provide assistance to communities to help the communities meet federal drinking water requirements." *The Safe Drinking Water Act Amendments of 1996, U.S. Code,* vol. 42, sec. 3.

[5] Henceforth, "capacity" and "capacity development" may be referred to simply as "capacity;" with the understanding that usage relative to existing or new systems provides sufficient differentiation.

[6] U.S. Environmental Protection Agency, *Information for the Public on Participating with States in Preparing Capacity Development Strategies* (July 1998), EPA 816-R-98-009, 1-2.

Technical capacity refers to the physical infrastructure of the water system, including but not limited to the source water adequacy (including wells and/or source water intakes, 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.

Water system capacity development is an effort by the states to help drinking water systems (primarily new or proposed systems) improve their finances, management, infrastructure, and operations so they can provide safe drinking water consistently, reliably, and cost-effectively. As a first step, each state is to prepare its own capacity development strategy. Although the details vary depending on the particular needs of the state's water systems, each strategy specifies how the state will identify and rank water systems that need assistance.

The new legislative emphasis on a water system's capacity—financial, managerial, and technical—to provide safe drinking water is an addition to historical practice that focused on a narrower contaminant-based scheme. It is, however, consistent with the tradition of standards and rule-based regulation that typify drinking water legislation. Predictably, the research agenda before the 1996 Amendments to the SDWA tended to focus largely on water quality as evidenced by physical and chemical measures. There were, however, some extensions into the financial "viability" of drinking water utilities.[7] The distinction between *viability* and *capacity* is, in this case, more than semantic. Viability evaluation was traditionally limited to the financial aspects of a utility. Viability also tends to invoke a "going concern" orientation in a financial and legal context. The newer capacity-based approach extends itself into the

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[7] See Janice A. Beecher, *Viability Policies and Assessment Methods for Small Water Utilities* (Columbus, OH: NRRI, 1991), and David W. Wirick with John Borrows and Steven Goldberg, *Evaluating Water Utility Financial Capacity with Ratio Analysis and Discounted Cash Flows* (Columbus, OH: NRRI, 1997).

managerial and technical aspects of a water utility.[8] The concept of capacity invokes a systems orientation for new and existing water utilities. This approach acknowledges the significant components of the system and stresses the importance of their interaction and contribution to the success of the system as a whole.

Regardless of terminology, the SDWA has clearly expanded its policy reach beyond the traditional contaminant and treatment technology areas. This extension has moved U.S. EPA's authority beyond the realm of pure environmental regulation and into the financial, managerial, and technical aspects of drinking water utilities. The overlap of regulatory jurisdictions between environmental agencies and commissions merits consideration, as do the implications for the regulated community.

Another potentially significant addition to the Act established the Drinking Water State Revolving Loan Fund (DWSRF) to assist states with the financial burdens associated with capacity efforts and to provide a financial incentive to comply with the new federal regulations.[9] DWSRF dollars are available at below market rates for eligible water systems in states that have implemented an acceptable capacity development program. [10] The long-run efficacy of this policy instrument remains to be seen. There is little question, however, that the construction grants program and low interest loans were important tools used by the federal government and the states to achieve many of the improvements now touted by the wastewater community on the

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[8] Beecher, 1991 introduces a policy framework for water system "viability" with technical, financial, and managerial elements. This work precedes the 1996 Amendments to SDWA and the U.S. EPA guidelines. It is good resource for the early development of the concept of viability.

[9] The SDWA provides capitalization grants to states in §130 (State Revolving Loan Funds). Additionally, it establishes eligibility criteria and reporting deadlines. Detailed information regarding the role of state regulatory commissions in DWSRF programs and the opportunities this represents is provided by John D. Borrows and Todd Simpson, *The Drinking Water State Revolving Loan Fund: A Guide for Regulatory Commissions* (Columbus, OH: NRRI, 1997).

[10] Equitable access to these funds is currently a matter of debate at the state, and federal level. As of this writing, 19 States have chosen to limit access to DWSRF funds to municipal drinking water companies, thereby denying access to investor owned utilities (IOUs). State-level DWSRF funding is based on a needs assessment of all drinking water utilities (including IOUs). It is conceivable, then, that states denying IOUs access to DWSRF dollars have more money available for municipal systems then they are entitled to based on the funding algorithm. A more important concern, however, is that the funds may in fact be denied to the very systems that need them the most – small IOUs.

other side of the pipe. These sources of funds and the incentives they provided played a pivotal role in moving the nation's wastewater industry from primary to secondary treatment. The intent and hope is that the DWSRF funds will have a similar effect for drinking water plants with capacity issues.

A Framework for Analyzing Capacity

Figure 1 is a conceptual model for water system capacity.[11] This model is organized around the three goals of financial capacity, managerial capacity, and technical capacity. Successful systems, as the diagram indicates, are those systems that are able to satisfy each capacity goal singularly and all of the capacity goals in combination.

The conceptual model reveals that each of the three goals is further refined into a set of objectives that are designed to achieve the related goal. For example, the model establishes the linkage among the ownership accountability, staffing and organization, and effective external linkages of a utility as fundamental criteria to having the requisite managerial capacity to provide safe drinking water and quality services to customers.

The conceptual model for drinking water system capacity can be operationalized through specification and definition of a set of indicator variables for each of the objectives. The complete capacity framework is shown in Table 1. The U.S. EPA

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[11] U.S. Environmental Protection Agency, *Information for State on Implementing the Capacity Development Provisions of the Safe Drinking Water Act Amendments of 1996* (July 1998), EPA 816-R-98-008, p. 14. The U.S. EPA model shows "Short and Long-term Planning" at the intersection of the technical, managerial, and financial capacity goals. Planning is certainly a key component of achieving and maintaining overall system capacity, but planning (and a variety of other tasks) can be conducted for any element of the model at various increments of time. The amended model presented here suggests that the overall system's capacity exists in the nexus between the technical, managerial, and financial aspects of the utility.

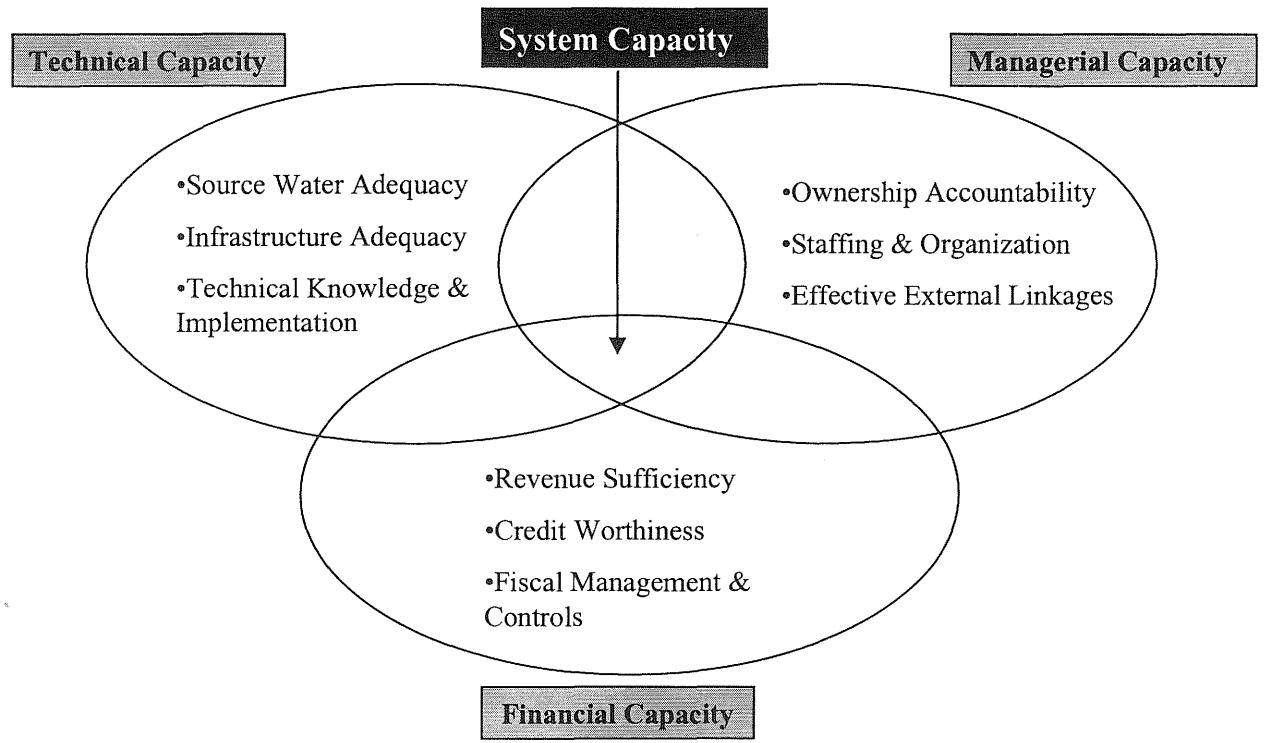

Figure 1: Conceptual model: Technical, managerial, and financial capacity.

Source: EPA 816-R-98-008

TABLE 1
CAPACITY TAXONOMY FOR DRINKING WATER SYSTEMS

GOAL	FINANCIAL CAPACITY			MANAGERIAL CAPACITY			TECHNICAL CAPACITY		
OBJECTIVE	**Revenue Sufficiency**	**Credit Worthiness**	**Fiscal Management & Controls**	**Ownership Accountability**	**Staffing & Organization**	**Effective External Linkages**	**Source Water Adequacy**	**Infrastructure Adequacy**	**Technical Knowledge & Implementation**
INDICATOR	Revenues vs. expenses	Credit rating	Books and records	Ownership identification	Identification of operator/manager	External resources	Source quality	Infrastructure condition	Operator certification
	Rate structure	Access to capital	Budgeting and reporting	Management information systems	Training and education	Intersystem communications	Source protection	Life expectancy	Operation and maintenance program
	Billing and collection	Financial ratios	Accounting practices		Qualified staff	Customer communications	Source reliability	Capital improvement plan	
	Revenue for depreciation and interest	Bonds and assurances	Asset valuation		Appropriate staff	Communication with regulators			
	Cost of service studies	Debt to equity ratio	Capital facilities plan		Procedures and policies				
			Management revenues		Regulatory knowledge				
			Investment strategy						

Source: Author's construct with input from EPA 816-R-98-008.

provides definitions and substantive guidance at each level of the capacity taxonomy.[12] Generally, the set of goals is designed to insure that each system will "achieve and maintain compliance with SDWA requirements."[13] Again, an inherent feature of the capacity concept is that various elements of the framework are related and interdependent, just as they were in the conceptual model. For example, source water quality, protection, and reliability are the primary indicators for the source water adequacy objective for drinking water utilities. Adequate source water is an important component of the larger goal of technical capacity, which further contributes to the overall capacity of the system. The extent to which a utility achieves these goals and objectives and complies with the requirements of SDWA, then, is dependent on the successful synthesis within and between all levels of the framework.

Data Analysis

The NRRI Capacity Database

The NRRI has designed and built a capacity database to further the analysis of state-level rules and regulations for drinking water utilities.[14] The current database includes input provided by 39 state regulatory commissions. The contributors to the NRRI capacity database are shown in Figure 2. The input provided by the commissions was of four basic types: commissions' water rules, management audits, reports, and tariffs. The data were characterized according to the taxonomy specified in the

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[12] See U.S. Environmental Protection Agency, *Guidance on Implementing the Capacity Development Provision of the Safe Drinking Water Act Amendments of 1996* (July 1998), EPA 816-R-98-006; EPA 816-R-98-008; EPA 816-R-98-009; and *Hypothetical State Programs for Ensuring that All New Community Water Systems and Non-Transient Non-Community Water Systems Demonstrate Technical, Managerial and Financial Capacity* (July 1998), EPA 816-R-98-010 for more specific detail.

[13] EPA 816-R-98-008, p. 9.

[14] The NRRI capacity database was expressly designed for research efforts relating to issues affecting commissions and regulated water utilities. The current design would not limit its extension into other "state-level" analyses that included non-regulated utilities.

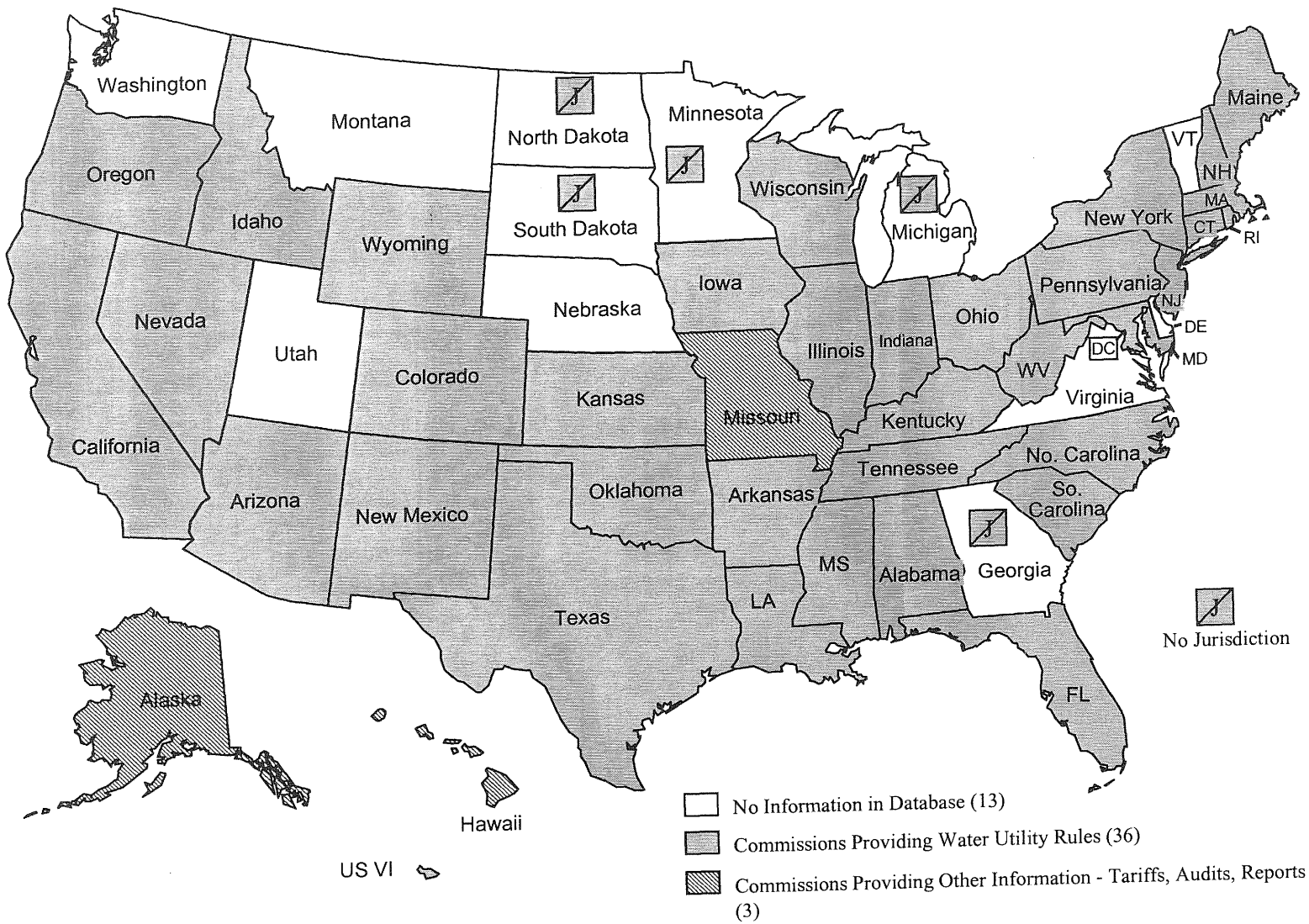

Figure 2: Sources of data for the NRRI capacity database.

capacity framework (Table 1). Classification of the data was achieved at the three levels (goals, objectives, and indicators) of the framework. Analysis was then possible between indicators, and, through aggregation, within and between objectives and goals. It is important to note that the database objectively accounts for each indicator's presence in a specific document only once. Subsequent or repeated occurrences were noted on the document but not incorporated into the database. Additionally, no attempt was made to subjectively judge, weight, or rank the sufficiency or extent to which a specific citation addressed the capacity issue. The database, therefore, reflects an objective breadth of indicator coverage but does not currently project the robustness within any indicator type. Using this scheme, therefore, it is not possible to infer any ordinal rankings or comparisons between state submissions.[15]

Observations

The documentation from the states varied in the amount and type of details present. This is especially evident for the various data sources (rules, audits, reports, and tariffs) that were provided. The most effective method for assuring that the data analyzed were commensurate was to segment the database to allow differentiation by input type. As the set of commission water rules provided by 36 of the 39 states in the NRRI capacity database was the most comprehensive, consistent and comparable, the analysis conducted for this study was limited to the data in the rules. Imposing this criterion established an upper bound of 36 responses for any indicator. The states providing water rules that were included in the database and the analysis are shown in Figure 2.

The overall distribution of capacity indicators observed in commission water rules is shown in Figure 3. Figures 4 through 10 facilitate comparisons involving the objectives and goals level of the framework. Observations from the distribution of the

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[15] Additionally, it was not the objective of this study to make between-state comparisons. This comparison is possible in theory, but additional data would be necessary to make the comparison meaningful with respect to the differences that exist between such things as state regulatory climates, economic conditions, political factors, and environmental considerations.

data can be made at the various levels of the capacity taxonomy. This discussion will proceed from the most specific level of the taxonomy, the indicator level, and use this as the foundation upon which to proceed to the second tier of the taxonomy, the objectives level. The analysis will then move upward from the objectives level to the most general tier of the capacity framework, the goals level.

Indicators (Tier One)

Figure 3 facilitates the comparison of indicators across the entire set of responses. This figure contains the most detailed information currently available regarding the extent to which commissions address capacity parameters in their water rules. The capacity variables are organized ordinally within their respective objective categories. The objective clusters are further organized according to their appropriate capacity goal. An analysis of the information at this level of detail reveals that:

- None of the 37 capacity indicators was addressed by all 36 of the commission water rules. The maximum number observed for any indicator (communication with customers) was 32 of the 36 possible observations.

- Approximately 25 percent (9 of 37) of all indicators were accounted for by at least one half of the respondents. These indicators were billing and collections, rate structure, books and records, source water reliability, source water quality, infrastructure condition, operation and maintenance programs, communication with customers, and communication with regulators.

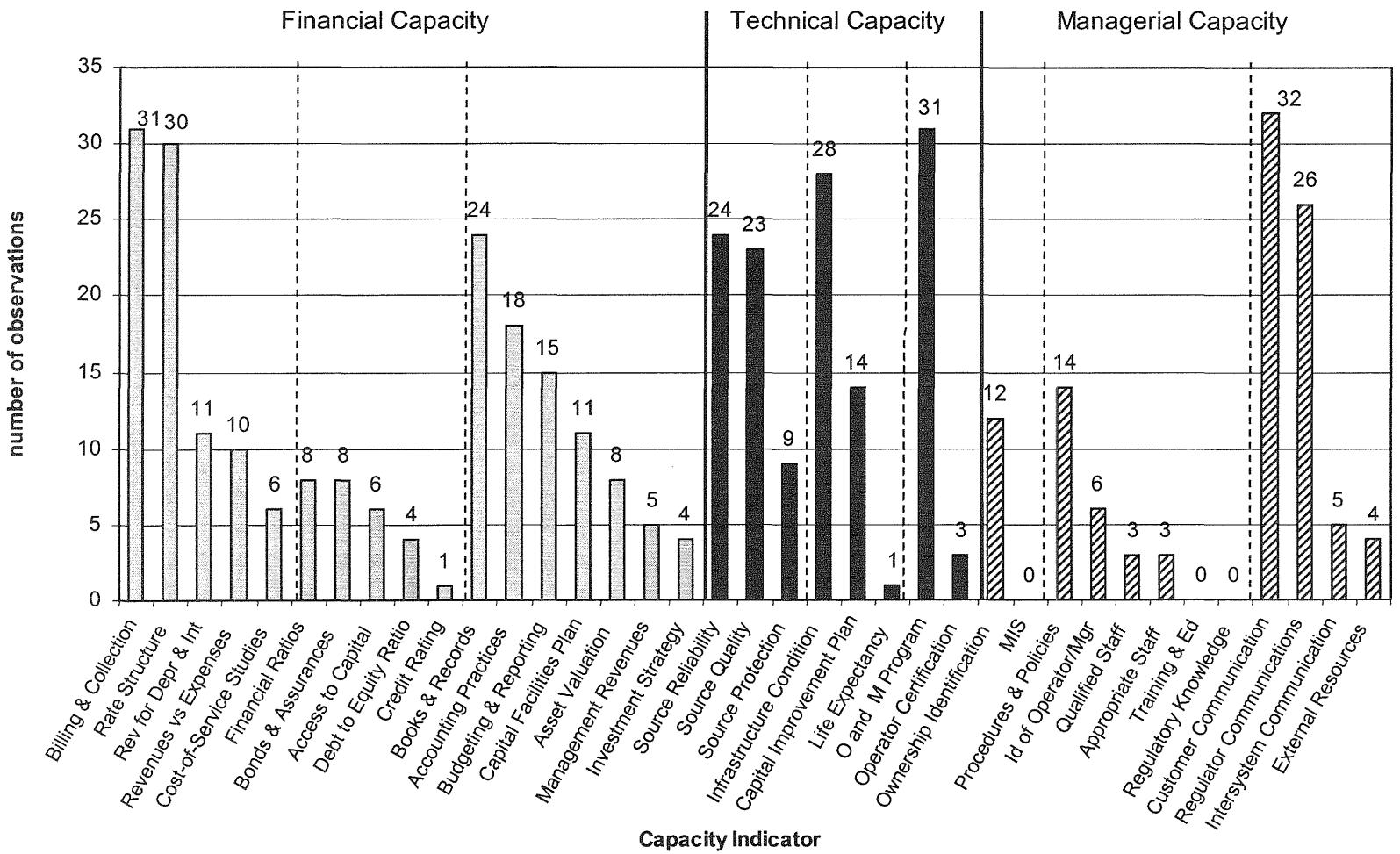

Figure 3: Distribution of capacity indicators observed in commission water rules (n_{max}=36).

- The most frequently observed indicator (32 observations) was for communication with customers. Billing and collections[16] and operation and maintenance programs were next with 31 citations, and rate structure was a close third with 30 observations in the data set.

- Approximately 57 percent (21 of 37) of the indicators were observed 10 times or less; with 3 indicators (management information systems, training and education, and regulatory knowledge) having no observations in the data set.

As previously noted, it is beyond the scope of this study to judge whether or not any set of water rules sufficiently addressed, either singularly or in the aggregate, the capacity requirements mandated by the SDWA. This analysis shows that commission water rules do cover many of the capacity indicators described in the U.S. EPA guidelines. The analysis also highlights the degree to which these indicators are represented in a reasonable sample of water rules. At a minimum, commissions can use this information as a benchmarking tool for evaluating and reviewing their own rules. It could also stimulate consideration of commission responsibilities under the SDWA that are not currently addressed in their rules, practices, policies, or procedures. Of course, rules are not the only indicator of commission authority. A state may have investigatory powers that allow it, after following due process, to find that a remedy is required in one or more aspects of water provisioning that is not necessarily covered by an existing rule. The absence of a specific rule, therefore, does not necessarily mean that a state has not or will not in the future monitor a utility's performance or require a utility to comply with the results of a "capacity" order.

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[16] It is worth noting that there is a high degree of correlation between billing and collections and commission requirements for water companies to communicate with customers regarding billing and collections. Additionally, communications with regulators was typically specified as the preferred method of addressing disagreements between customers and the utility regarding billing and collections.

Objectives (Tier Two)

The intermediate tier of the capacity framework is organized around categories of capacity objectives. Figures 4 through 6 facilitate comparisons within and between the nine different objective categories. These figures ordinally relate the number of observations for each indicator within its appropriate category. A further refinement of the data is achieved through normalization. Normalizing the data allows proportional comparisons relative to the number of opportunities for indicators, objectives, or goals to be observed. For example, there are 17 financial capacity indicators versus 8 technical capacity indicators. Therefore, the potential for observing financial capacity is greater than for technical capacity. The figures reveal that:

- At a minimum, some capacity indicators were observed in all of the objective categories of the framework.

- There was significant variation observed in indicator coverage within the objective categories. For example, in the objective category infrastructure adequacy there were 28 observations for infrastructure condition, 14 for capital improvement plans, and only 1 for the life expectancy variable (see Figure 5). Figures 4 to 6 facilitate this form of analysis within objective categories.

- There was significant variation observed in the indicator coverage between objective categories. For example, the objective dealing with effective linkages accounted for 62 percent of the category total (see Figure 9). In this case the ownership accountability category at 22 percent and the staffing and organization category at 16 percent received considerably less attention. Figures 7 to 10 facilitate this form of analysis among objective categories.

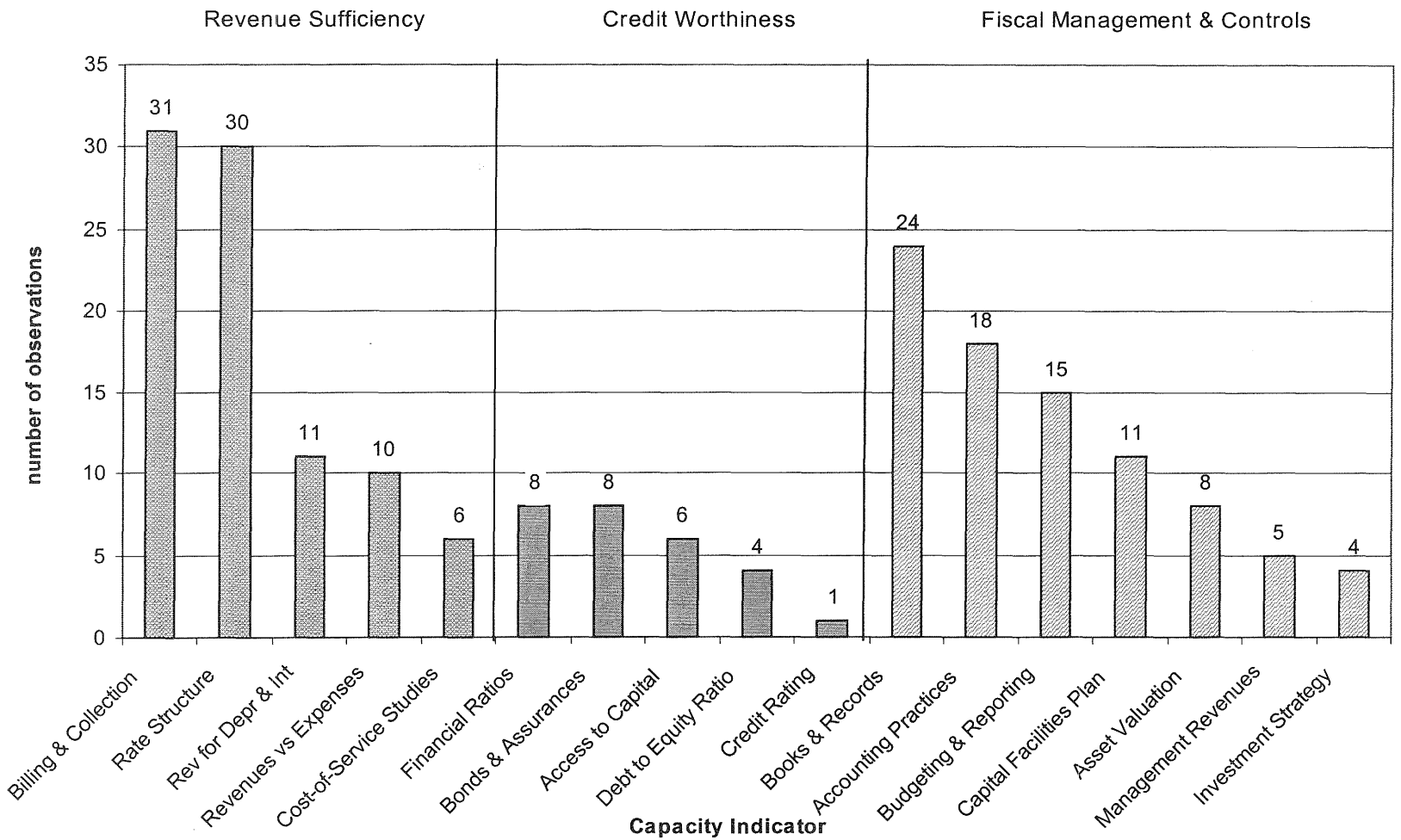

Figure 4: Distribution of financial capacity indicators (n_{max}=36).

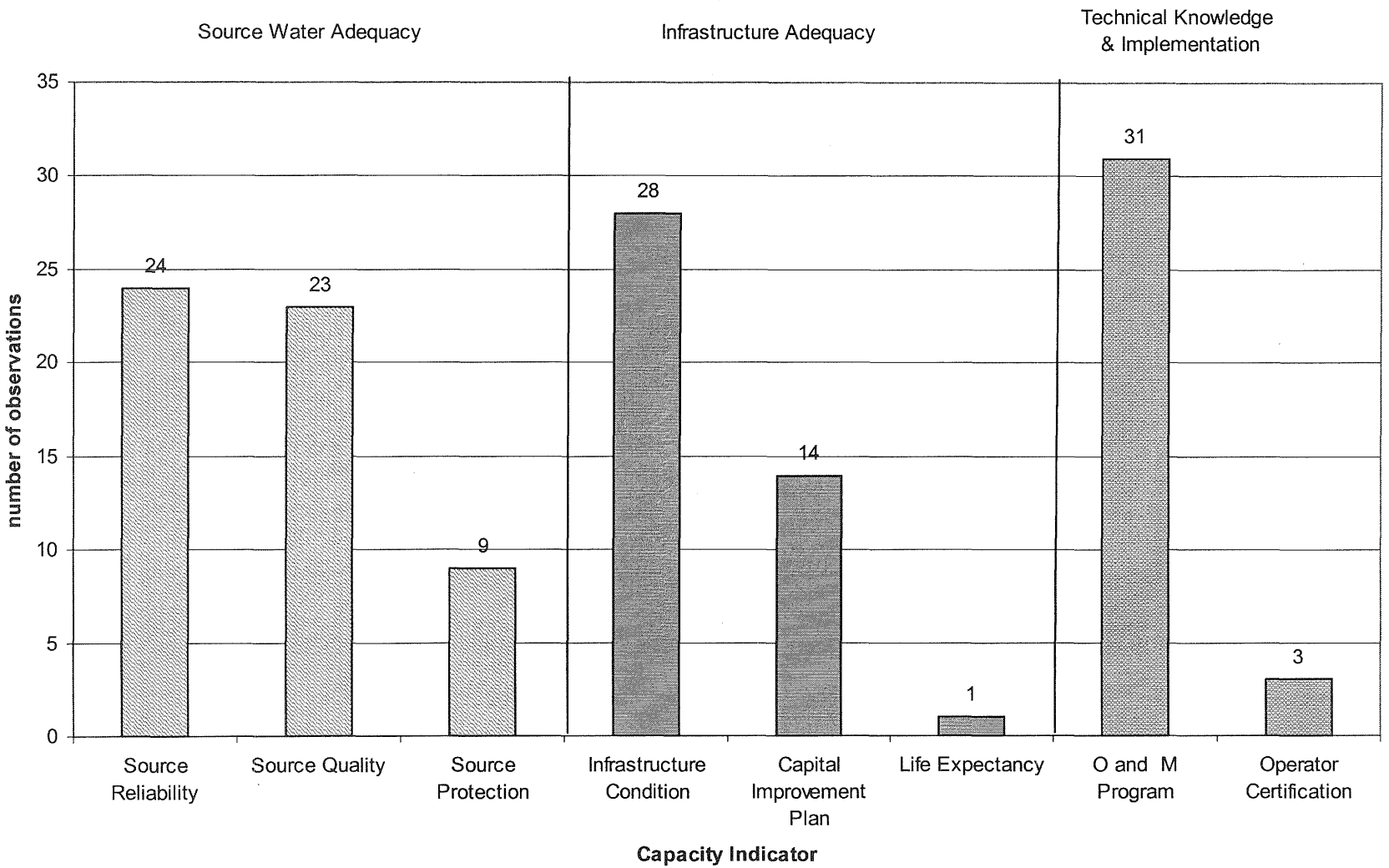

Figure 5: Distribution of technical capacity indicators (n_{max}=36).

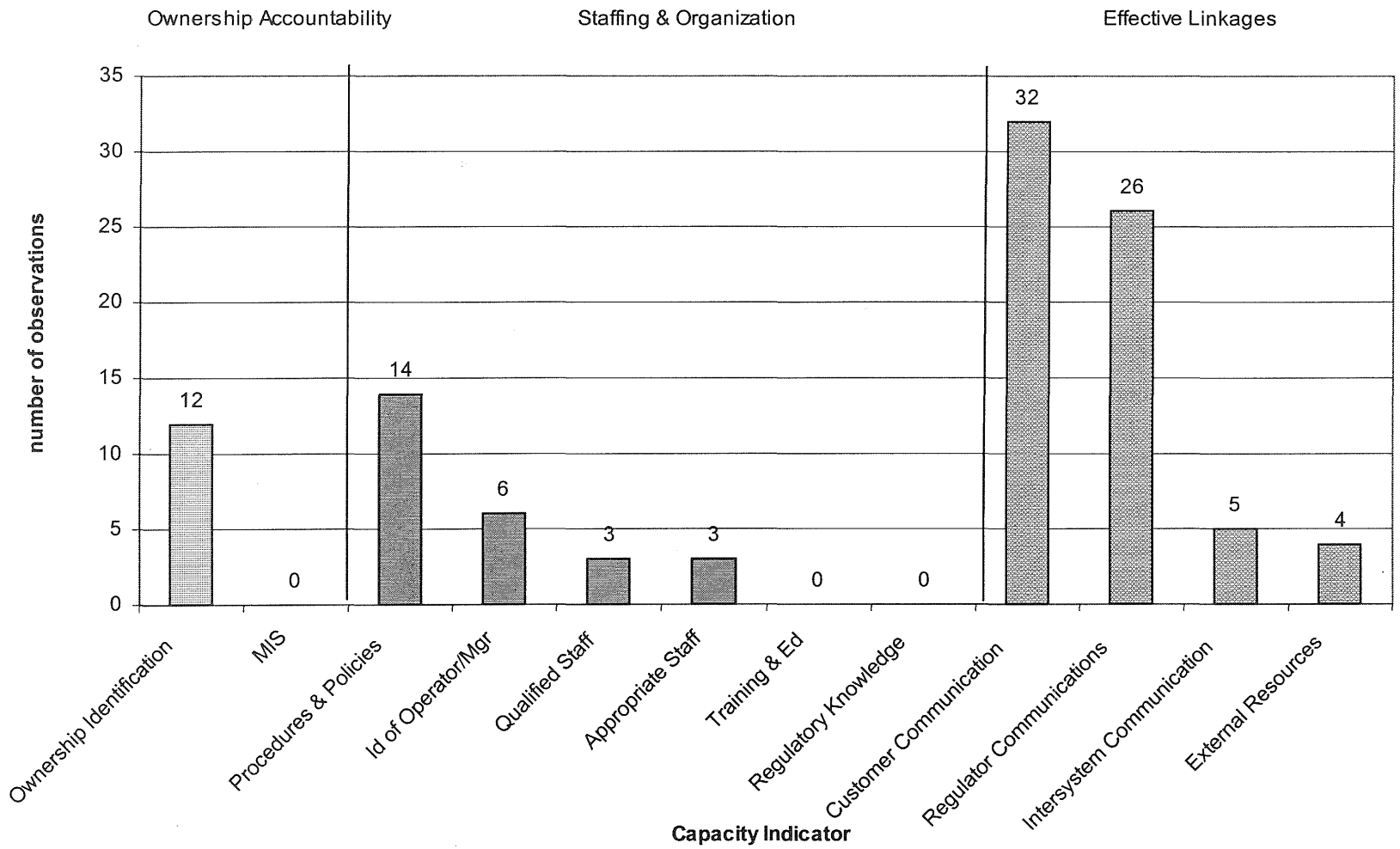

Figure 6: Distribution of management capacity indicators (n_{max}=36).

Goals (Tier Three)

The most aggregated level of analysis conducted in this study occurred at the goal tier of the framework. Again, Figures 7 to 9 can be utilized to compare the relative contribution of each objective within its associated capacity goal, but do not allow comparison between goals. Figure 10 can be used to compare the variation among the three types of capacity goals. The data in Figure 10, like that in Figures 7 to 9, is normalized. These figures indicate that:

- Within the financial capacity goal, Figure 7 shows that there was a distinct proportional emphasis on revenue sufficiency (50 percent) relative to that applied to fiscal management and controls (35 percent) and credit worthiness (15 percent).

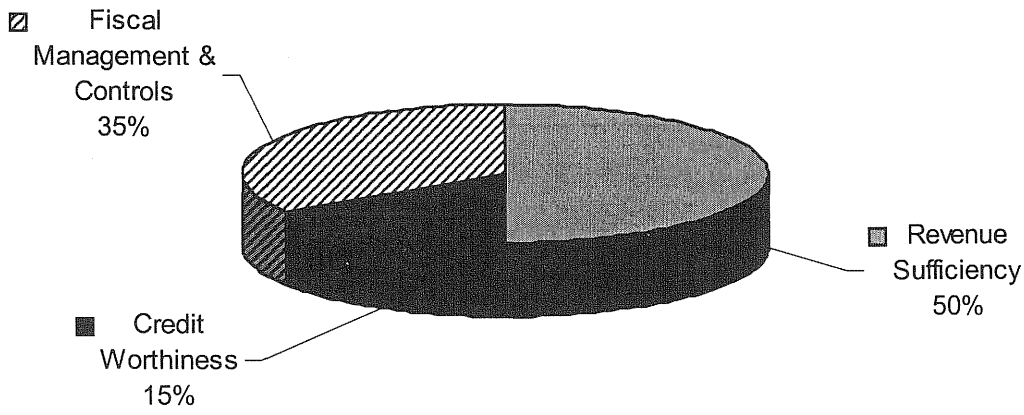

Figure 7: Financial capacity observations.
Proportionally adjusted by category (n_{obs}=200).

- Within the technical capacity goal there was less than 10 percent total variation among all three objective categories. Figure 8 reveals that source water adequacy was the most emphasized at 37 percent, while technical knowledge and implementation at 33 percent and infrastructure adequacy at 29 percent were relatively close.

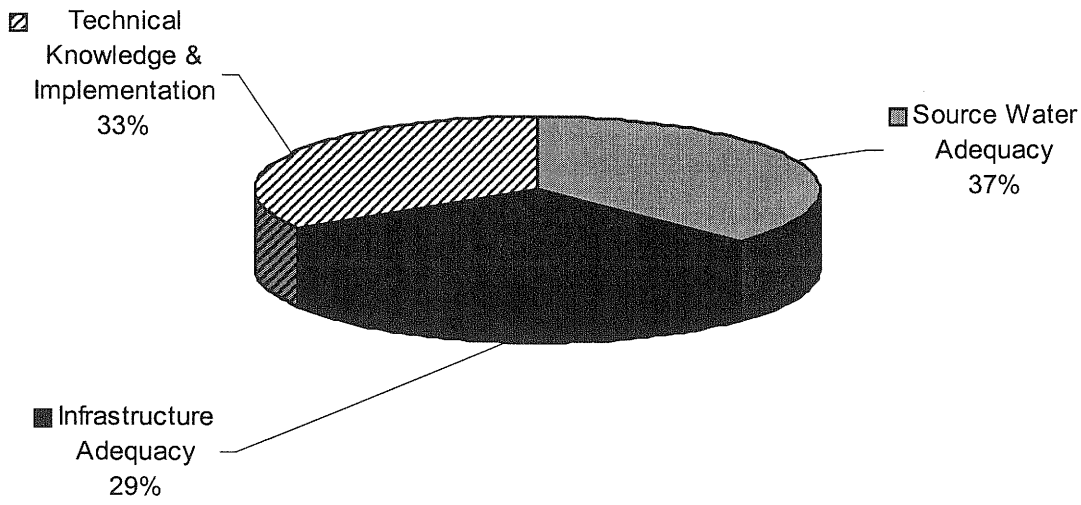

Figure 8: Technical capacity observations.
Proportionally adjusted by category (n_{obs}=133).

- Within the management capacity goal, Figure 9 depicts issues concerning effective linkages (62 percent) dominated those associated with ownership accountability (22 percent) and staffing and organization (16 percent).

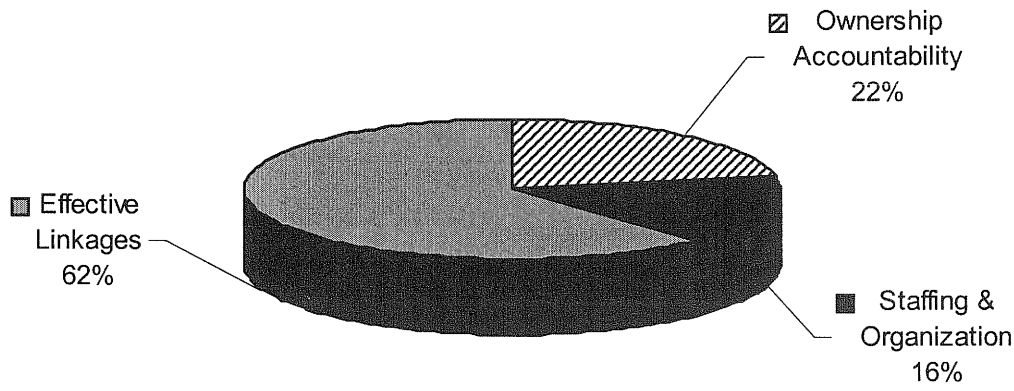

Figure 9: Managerial capacity observations.
Proportionally adjusted by category (n_{obs}=105).

Figure 10 shows that, when normalized, there was a distinct difference in the number of observations for all three capacity goals. However, at the highest level of aggregation, all three of the capacity goals were covered in the commission water rules within an approximate range of each other that varied by less than 20 percent. It is noteworthy that the data suggest commission water rules address technical capacity relatively more than either financial or managerial capacity. This finding is counterintuitive in that the traditional role of commissions has been oriented towards the financial and managerial aspects of a utility— technical aspects of providing safe drinking water have largely fallen under the jurisdiction of state primacy agencies.

One likely reason for this unexpected finding is offered by the specification of the capacity model itself. Some variables may be too closely related to other variables or exist as a subset of another variable in the taxonomy. For example, debt to equity ratios are certainly one type of financial ratios. Maintaining books and records and properly performing budgeting and reporting activities are closely related and can fall under the broader category of acceptable accounting practices. In this example it is foreseeable that five separate indicator variables may be subsumed by one or two variables in the actual rules.

Another feature of the analysis that may explain to the apparent focus on technical capacity in the audited water rules has to do with the depth of coverage provided. For example, a set of commission rules may go into considerable detail regarding billing and collections but only cursorily mention source water quality, protection, and reliability. Since the methodology used in this study would note each indicator once, regardless of differences in depth of coverage, the results would suggest incorrectly that three times more attention was applied to technical capacity than to financial capacity (three source water indicators to one revenue indicator).

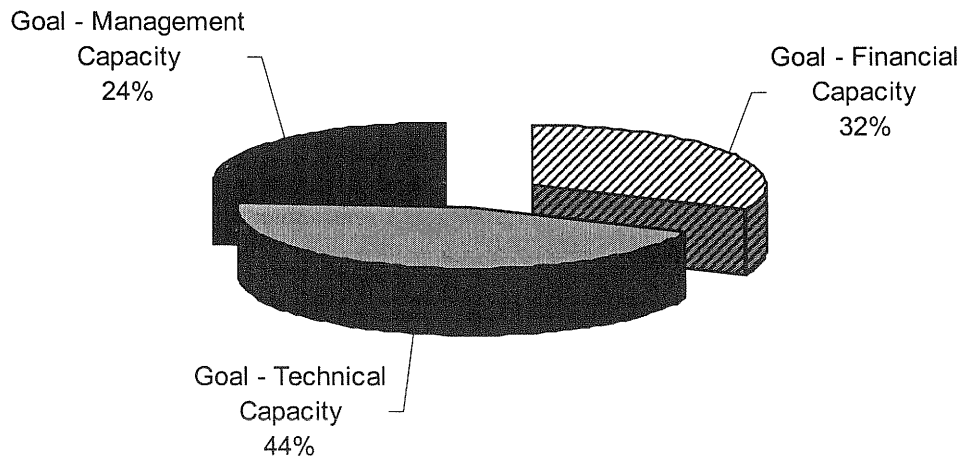

Figure 10: Variation between goals. Proportionally adjusted by capacity goal.

Regardless of inconsistencies in specification of relationships of variables and depth of coverage, the data show that existing commission water rules do cover a wide variety of the capacity indicators, objectives and goals suggested by the U.S. EPA guidelines. There are obviously many possible variations in the ways that successful capacity policies and programs can be constructed from some or all of the variables present in this model and through the addition of other variables that reflect state priorities and goals.

Policy Considerations

The 1996 Amendments to the SDWA have interjected a new policy parameter—capacity and capacity development—into the rules-based orientation of the Act. The intent of this analysis is to offer an objective vehicle for discussing the current status of commission water rules relative to this new set of requirements. It is beyond the scope of this study to determine what constitutes the "right" level or mix of capacity requirements in commission water rules. It is hoped, however, that the data and analysis presented here will facilitate informed discussions in the regulatory community not only about what the current status of capacity in drinking water utilities is but what it ought to be. Table 2 is offered as an example of the types of questions that may be meaningful to regulators as they continue to study and act on the implication of the 1996 Amendments. The table identifies consistently with the framework for analysis developed for this report the questions that regulators may ask themselves when considering the capacity guidelines forwarded by U.S. EPA.

TABLE 2
SALIENT QUESTIONS REGARDING SDWA CAPACITY REQUIREMENTS

LEVEL	QUESTION
Goals	Are all three capacity goals equally important, or are some more important than others?
	Is there an optimum mix or synthesis between and among the goals, and if so, what is it?
	Are all of the important capacity goals present in the conceptual model, and have they been sufficiently operationalized in the capacity framework?
	Is a rules-based approach to drinking water quality that mandates capacity and capacity development more likely to achieve the desired results than alternate regulatory strategies?
Objectives	Are all nine capacity objectives equally important, or are some more important than others?
	Is there an optimum mix or synthesis between and among related capacity objectives, and if so, what is it?
	Are all of the important capacity objectives present in the conceptual model, and have they been sufficiently operationalized in the capacity framework?
Indicators	Are all 37 capacity indicators equally important, or are some more important than others?
	Is there an optimum mix or synthesis between and among related capacity indicators, and if so, what is it?
	Do the indicator variables contained in the operationalized framework constitute a necessary and sufficient set of measures of a drinking water system's capacity or ability to develop capacity?

Source: Author's construct.

Another feature of SDWA that raises policy implications for utilities and regulators stems from the capacity guidelines developed by the U.S. EPA. The guidelines clearly acknowledge the commissions' "basis of authority" for economic regulation of utilities within their jurisdictions.[17] The guidelines also suggest that commissions are the "control points" for ensuring certain elements of a new or proposed drinking water system's capacity development.[18] However, the guidelines present a limited set of responsibility areas for commissions. Under the U.S. EPA construct commissions would serve as control points for insuring capacity development for new water systems in the areas shown in Table 3. Table 3 aligns the relevant elements from the capacity taxonomy (Table 1) with the control point information in order to depict the relationship between the responsibilities assigned to commissions in the U.S. EPA guidelines with those identified in the existing capacity framework.

The juxtaposition of prescribed control points with capacity indicators reveals several anomalies. Perhaps the most interesting is that, whereas commissions are vested with the authority for economic regulation, the U.S. EPA does not identify them as control points for many of the financial indicators in the capacity framework.[19] Additionally, it is not clear where the authority and subsequent control points exist for financial indicators that are not assigned to state commissions, since these relationships are not fully articulated in the U.S. EPA guidelines. Furthermore, a compelling case can be made that commissions are not only responsible for, but have

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[17] U.S. EPA's implementation guidance (EPA 816-R-98-006, p.22-23) identifies the minimum requirements for ensuring that all new community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) demonstrate technical, managerial and financial capacity. Furthermore, States are required to have a "realistic" implementation schedule in place by October 1, 1999.

[18] The current control point discussions are limited to capacity development considerations for new or proposed systems. Control points for existing systems have not yet been forwarded by the U.S. EPA. It is likely, however, that a similar concept will emerge for existing systems in future U.S. EPA guidelines.

[19] The authority of the commissions is, of course, generally limited to privately owned utilities. The U.S. EPA's "control points" do not extend the role or authority of Commissions into nonjurisdictional utilities.

TABLE 3
CONTROL POINTS FOR STATE COMMISSIONS FOR INSURING CAPACITY DEVELOPMENT FOR NEW WATER SYSTEMS

Control Point	Related Indicators	Related Objectives	Related Goals
Certificate of convenience and necessity	None identified	None identified	None identified
Approval of system's investments (rate base)	Rate structure	Revenue sufficiency	Financial
	Investment strategy	Fiscal management and controls	Financial
	Capital improvement plan	Infrastructure adequacy	Technical
Approval of system's financial structure (debt and equity)	Debt to equity ratio	Credit worthiness	Financial
System planning requirements	Capital facilities plan	Fiscal management and controls	Financial

Source: Author's construct based on EPA 816-R-98-008, p. 20-21.

jurisdiction over, many of the other areas captured by indicators that fall under the headings of both technical and managerial capacity. Finally, it is not clear what level and scope of inter-agency communication and coordination need to exist to properly address the variables for which commissions are identified as control points for new systems.

Rather than limiting or encroaching on the traditional role of commissions, the U.S. EPA guidelines may expand commission oversight into new territory. For example, commissions are identified as control points for ensuring technical capacity via assessments of infrastructure adequacy. As indicated in Table 3, the guidelines suggest that commissions through their rate-making activities are control points for

monitoring a utility's capital improvement plans. This raises questions, once more, regarding "control points" and "bases of authority," as to whether this is a piecemeal or a unified approach to assuring capacity development across the entire spectrum of indicators, objectives, and goals. The assumption, once more, appears to be that other state or federal agencies are also involved in the process and responsible for various components of the model. Again, this highlights the need for clarification and communication among commissions and other federal and state agencies responsible for capacity planning.

There are several findings and implications for regulators and regulated utilities that merit attention. First, commissions are viewed as being responsible, as control points, for some (but not all) of the financial capacity indicators specified by the 1996 Amendments. Therefore, commissions may wish to consider exploring the extent to which the prescribed set of financial indicators suggested in the U.S. EPA guidelines meet state needs with respect to new system capacity development.

As specified, commissions are not identified by the U.S. EPA guidelines as having a basis of authority or control point responsibilities for technical capacity and managerial capacity issues for new drinking water systems. The exception to this is with respect to capital improvement plans. Commissions may wish to consider which, if any, of the technical and managerial indicators play an integral role in meeting their traditional responsibilities, which indicators now require attention as mandated by the SDWA, and what level of communication and coordination needs to occur with other agencies on these issues.

Jurisdictional issues, control point issues, and the avenues to communicate and coordinate with other agencies should be explored more fully. These requirements are suggested by the SDWA Amendments, but the mechanisms are not clear. Ultimately, the success of the capacity concept may very well depend as much on successful interagency coordination and communication as it does on the unilateral implementation of assigned tasks.

Within the control point areas assigned to commissions (see Table 3), a review of the water rules categorized in the NRRI capacity database indicates that only the

rate structure variable was addressed in more than 50 percent of commissions' water rules (see Figure 2). It is certainly possible that more general commission rules, policies, and procedures address the financial indicators called for in the guidelines. Commissions may wish to review the completeness of their rules for water utilities in light of the requirements imposed by the 1996 SDWA Amendments and the U.S. EPA guidelines.

Interjurisdictional issues may arise as a result of the capacity concept mandated in the SDWA and outlined in the capacity guidelines from U.S. EPA. The DWSRF is both the reward and the penalty associated with compliance within the new framework. At a minimum, commissions may want to ensure that utilities falling under their jurisdiction have equal access to the funds and receive an equitable portion of the state's overall DWSRF allotment.

Commissions may want to review the capacity indicator taxonomy at all levels. As posed, all indicators are created equal. When customized at the state level, it is unlikely that all of the indicators of system capacity will carry the same level of significance. It is even less likely that there is uniformity among states. Establishing a two-tiered system of indicators is a minimum step towards differentiating between the indicators and what they measure. Commissions should be able to assess which indicators measure necessary and required elements of system capacity at one level. The second level, then, might be used to identify optional measures that are important for some utilities but not necessarily for all.

In summary, commissions may want to customize their own indicator taxonomy using, but not limited by, the information provided by U.S. EPA and this report. A customized framework might add some indicators not present here, delete others, and provide differentiation with respect to their importance in achieving the goals and objectives identified by the commission. The development and implementation of a uniform state-specific framework and policy for all jurisdictional water utilities might simplify and streamline commission procedures, reduce uncertainty for regulated utilities, improve customer satisfaction, and enhance the provision of safe drinking water. Additionally, future U.S. EPA guidelines are likely to extend the lessons learned

in designing and implementing capacity development programs for new and proposed systems into the arena of existing systems. Commissions may find it useful and productive to communicate their capacity development experiences to state primacy agencies and the U.S. EPA. This communication will serve to better inform the next generation of capacity initiatives.

There are undoubtedly many other questions and policy implications that may arise as a result of the information presented here. At a minimum, it is hoped that this data and analysis will further the discourse and development necessary for commissions to successfully design and implement the requirements for capacity planning and development.

Summary

The 1996 Amendments to the SDWA and the accompanying U.S. EPA guidelines have continued in the tradition of standards and rule-based strategies for regulation. Although not a departure from this scheme, the inclusion of the capacity development requirements in the amended SDWA does extend the influence of the Act into a new domain that proposes to regulate certain technical, managerial, and financial aspects of a utility. The Act imposes new requirements on state primacy agencies and other agencies, including state regulatory commissions. This report has given an overview of the concept of drinking water capacity and capacity development. The U.S. EPA implementation guidelines referenced in this report can be another valuable source of information for commissions on this topic even though the target audience is state primacy agencies.

The SDWA and the U.S. EPA's interpretation and implementation of it are important for reasons extending beyond the direct applicability of the Act. The Act and its implementation address, primarily, the expectations for utilities at the point of the initial service offering. The capacity development objectives are designed to halt the proliferation of service provision by suppliers with doubtful longer-term prospects. This is a laudable goal in itself, and the structure for implementation of the SDWA appears

likely to have positive impact on the achievement of that objective. The effort expended in developing procedures, analytical processes, and expertise to pursue this element of the SDWA vests the regulators with a set of tools that can be useful in analyzing and promoting the capabilities of established utilities in meeting the needs of their customers in the future. State commissions can serve as "control points" for many indicators and at all levels of the capacity framework that are appropriate and consistent with their general regulatory responsibilities. The necessity to communicate and coordinate with other state and federal control point agencies involved in the capacity issue holds the promise of improving operations and performance not only for water utilities but other regulated sectors as well. Using the skills and processes developed to meet the requirements of the SDWA for evaluating jurisdictional utilities at other appropriate junctures would have the advantage of introducing consistent expectations and extending the scope of the capacity monitoring initiative. In addition to introducing measures of the financial, technical, and managerial attributes for jurisdictional utilities, commissions may be able to utilize these skills and procedures to contribute to the evaluation of nonjurisdictional utilities through cooperative agreements with other state, federal, or local authorities. Meeting the criteria promulgated by the SDWA, then, may provide commissions with a foundation for ensuring that regulated water utilities have adequate technical, managerial, and financial capacity and/or are taking steps to develop capacity and the opportunity to leverage this concept into new applications.

It is beyond the scope of this study to determine the appropriateness of the capacity concept as mandated in the SDWA and translated by U.S. EPA. The lack of empirical evidence supporting the causal relationships between any level of the capacity framework and the provision of safe drinking water is an obvious shortcoming. The promulgation of agency rules without scientific or economic validation should raise a red flag for regulators and the regulated community alike. It should also serve as a strong signal for the need for further investigation and future work in this area. There are obvious questions that can and should be raised by commissions as they consider whether the model for capacity development is properly specified for their individual

purposes and, to the extent possible, captures the correct capacity variables and their proper interactions. Even though there is no empirical evidence for the conceptual design forwarded by U.S. EPA or offered here, there is at least an acknowledgment of an intuitive appeal to the concept in general. Another upside is that the requirements for capacity development are not completely codified and that both the legislation and U.S. EPA's guidelines encourage states to customize the framework to suit their specific needs. Hopefully, additional data and analysis will be possible as implementation of the provisions begins to occur. At that point it should become possible to make better judgments regarding the appropriateness of the approach and to refine and improve it as necessary.

APPENDIX A

EXCERPT FROM TEXAS CAPACITY DEVELOPMENT STRATEGY REPORT

Appendix A is an overview of one state-level strategy for developing and implementing a capacity development program. The University of New Mexico Environmental Finance Center assisted the Texas Natural Resource Conservation Commission (TNRCC) with the development of capacity criteria for new systems, existing systems, and systems seeking DWSRF funding. The program includes an implementation plan accompanied by strategies for stakeholder involvement and communications. Texas' approach to capacity development and planning reflects a high degree of integration between the state primacy agency and commission-oriented utility regulation. Water utilities are regulated by the Utility Rates and Services Section of the Water Utilities Division within TNRCC.

TABLE A-1
State of Texas Capacity Framework

System Type	Financial Capacity	Managerial Capacity	Technical Capacity
District	*Annual Financial Report:* Required to file audited financial report; report must certify that water district personnel received training required under the Public Funds Investment Act *Bond Approval:* review and approval before district issues bonds; includes financial review of ability of district to make debt service payments *Certificate of Convenience and Necessity: ONLY if serving in area certified to another system* *TNRCC publications for districts and newsletter* - "Water District Update;" also new district information packets *District Creation Review* to determine if project is feasible, practicable and a benefit to the land in district *Rate Approval/Rate Review:* ONLY if least 10% of rate payers petition TNRCC	*Annual Financial Report Required:* Audit reports must include management letters which may indicate internal control weaknesses; desk review of audit reports may indicate problems *Bond Approval:* review and approval before district issues bonds; review of resolutions of governing board *Consumer Assistance Staff:* records customer complaints and works with utilities and customers to get resolution *TNRCC publications for districts and newsletter* - "Water District Update" *Utility Assistance Team:* provides in-depth management assistance *Management Assistance:* Circuit Rider Program coordinated by Utility Assistance & Certification Team of Water Utilities Division *Small Town Environment Program (STEP):* Program to help communities take charge of their own projects and complete some of the construction using volunteer community labor	*Bond Approval:* review and approval before district issues bonds; engineering review of facilities to be purchased with bond proceeds *Enforcement Activities* against non-compliant systems; systems are notified and remedial efforts are tracked *Microbiological and chemical sampling and analysis results:* reports at various intervals *Operator Certification:* all PWS required to be operated under supervision of certified operator *Sanitary Survey Results:* conducted on annual basis *Surface Water Plant Evaluation* (CPE) to ensure optimal performance *Vulnerability Assessment* to determine risk of groundwater contaminants *Approval of engineering plans and specifications* before construction or improvements on new or existing system *Technical Assistance:* Circuit Rider Program coordinated by Utility Assistance & Certification Team of Water Utilities Division *The Texas Utilities Update:* Newsletter produced semi-annually by consumer and Utilities Assistance Section of Water Utilities Division

TABLE A-1 (Cont.) State of Texas Capacity Framework			
System Type	**Financial Capacity**	**Managerial Capacity**	**Technical Capacity**
Municipality	*Certificate of Convenience and Necessity:* ONLY if serving in area certified to another system *Rate Approval/Rate Review:* ONLY if serving outside city limits and if at least 10% of ratepayers petition TNRCC	*Small Town Environment Program:* Program to help communities take charge of their own projects and complete some of the construction using volunteer labor	*Enforcement Activities* against non-compliant systems; systems are notified and remedial efforts are tracked *Microbiological and chemical sampling and analysis results:* reported at various intervals *Operator Certification:* all PWS required to be operated under supervision of certified operator *Sanitary Survey Results:* conducted on annual basis *Surface Water Plant Evaluation* (CPE) to ensure optimal performance *Approval of engineering plans and specifications* before construction or improvements on new or existing system *Vulnerability Assessment* to determine risk of groundwater contaminants

TABLE A-1 (Cont.)
State of Texas Capacity Framework

System Type	Financial Capacity	Managerial Capacity	Technical Capacity
Investor Owned Utility **(IOU)**	*Annual Report Required* *Certificate of Convenience and Necessity required, both inside and outside city limits;* approval to obtain, amend, cancel or transfer a CCN. Approval may involve review of debt/equity, ability to provide continuous service, feasibility of obtaining service from another utility. *Tariff required outside city limit, and inside if city does not require its own:* includes service rate schedule, service rules, extension policy and emergency water ration plan; Commission must approve tariff *Approval* required for proposed sale, transfer, merger or lease of system *Rate Approval/Rate Review:* required to obtain approval before changing rates; review process includes site visit to inspect record keeping procedures, billing and collection (Non-profit homeowners' associations also required to file Rate Change Application)	*Utility Assistance Team:* provides in-depth management assistance *Consumer Assistance Staff:* records customer complaints and works with utilities and customers to get resolution	*Enforcement Action* against non-compliant systems; systems are notified and remedial efforts are tracked *Microbiological and chemical sampling and analysis results:* reported at various intervals *Operator Certification:* all PWS required to be operated under supervision of certified operator *Sanitary Survey Results:* conducted on annual basis *Surface Water Plant Evaluation* (CPE) to ensure optimal performance *Approval of engineering plans and specifications* before construction or improvements on new or existing system *Vulnerability Assessment* to determine risk of groundwater contaminants *Technical Assistance:* Circuit Rider Program coordinated by Utility Assistance & Certification Team of Water Utilities Division *Rate Approval/Rate Review:* required to obtain approval before changing rates; review considers technical aspects of system, including compliance record

TABLE A-1 (Cont.)
State of Texas Capacity Framework

System Type	Financial Capacity	Managerial Capacity	Technical Capacity
Water Supply Corporation (WSO)	*Certificate of Convenience and Necessity required:* approval to obtain, amend, cancel or transfer a CCN. Approval may involve review of debt/equity, ability to provide continuous service, feasibility of obtaining service from another utility Review before granting of transferring CCN. This may involve review of debt/equity, ability to provide continuous service, feasibility of obtaining service from another utility *Required to file Tariff:* includes service rate schedule, service rules, extension policy and emergency water ration plan; tariffs are for information purposes only - TNRCC does not have approval authority over rates *TNRCC Publication*	*Utility Assistance Team:* provides in-depth management assistance *Small Town Environment Program (STEP):* Program to help communities to take charge of their own projects and complete some of the construction using volunteer community labor *TNRCC Publications* *Consumer Assistance Staff:* records customer complaints and works with utilities and customers to get resolution	*Enforcement Action* against non-compliant systems; systems are notified and remedial efforts are tracked *Microbiological and chemical sampling and analysis results:* reported at various intervals *Operator Certification:* all PWS required to be operated under supervision of certified operator *Sanitary Survey Results:* conducted on annual basis *Surface Water Plant Evaluation* (CPE) to ensure optimal performance *Approval of engineering plans and specifications* before construction or improvements on new or existing system *Vulnerability Assessment* to determine risk of groundwater contaminants *Technical Assistance:* Circuit Rider Program coordinated by Utility Assistance & Certification Team of Water Utilities Division
Others Border Counties	*Certificate of Convenience and Necessity required:* approval to obtain, amend, cancel or transfer a CCN. Approval may involve review of debt/equity, ability to provide continuous service, feasibility of obtaining service from another utility	*Small Town Environment Program (STEP)*	

Source: The University of New Mexico Environmental Finance Center, *Capacity Development Strategy Report,* for the Texas Natural Resource Conservation Commission (August 29, 1997).

APPENDIX B

STATE OF CALIFORNIA CAPACITY CRITERIA

Appendix B exemplifies a state-level strategy for developing and implementing a capacity development program. The State of California Department of Health Services, Division of Drinking Water and Environmental Management has developed a set of documents detailing the technical, managerial, and financial (TMF) capacity criteria for community water systems and non-community water systems (transient and non-transient).

The California TMF program reflects a three-tiered capacity framework comprised of mandatory, necessary, and recommended indicators. Reporting requirements vary by indicator, system type, change in ownership status, and DWSRF activity. The guidelines identify the specific documentation that must be submitted as part of the TMF review. They also list the evaluation criteria that will be considered by the agency responsible for assessing the individual TMF capacity indicator. Noteworthy among these is the requirement that, for investor owned systems, the California Public Utilities Commission's review of the budget plan will be required to assess the "budget projection" indicator under financial capacity.

State of California
Department of Health Services
Division of Drinking Water and Environmental Management

Technical, Managerial and Financial Capacity Criteria

for

Community Water Systems

Revised: February 9, 1999

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ACRONYMS

ASDWA.....Association of State Drinking Water Administrators
AWWA .....American Water Works Association
CCR .....California Code of Regulations
CEQA.....California Environmental Quality Act
CHSC .....California Health and Safety Code
CIP .....Capital Improvement Plan
LPA.....Local Primacy Agency
NEPA .....National Environmental Protection Act
SDWA.....Safe Drinking Water Act
SRF .....State Revolving Fund
SWAP .....Source Water Assessment and Protection Program
SWRCB .....State Water Resources Control Board
TMF .....Technical, Managerial and Financial Capacity
USEPA.....United States Environmental Protection Agency

Introduction

The 1996 federal Safe Drinking Water Act (SDWA) introduced the concept of Technical, Managerial and Financial (TMF) Capacity for public water systems. This concept involves a public water system having the capability through its financial resources, technical resources, organizational structure and personnel to comply with all applicable drinking water standards and regulations. In addition, the concept of capacity involves being able to plan for the future and use the necessary resources to keep the water system in compliance. The federal SDWA encourages, and in some circumstances requires, states to incorporate the TMF Capacity concept into their drinking water regulatory program. The Department of Health Services (Department) is developing and implementing a strategy to incorporate TMF Capacity development into California's drinking water regulatory program. The TMF Capacity Criteria contained in this document is a part of the Department's TMF Capacity development strategy.

The definitions of Technical, Managerial, and Financial Capacity given in guidance published by the United States Environmental Protection Agency (USEPA) are very general in nature. As such, the Department has developed criteria to use in assessing the TMF Capacity of public water systems in the state of California. However, because implementation of this criteria will vary based on the type of water system being assessed, two sets of TMF Capacity Criteria have been derived from the overall criteria, one for community water systems and one for noncommunity water systems. **This document contains the TMF Capacity Criteria that will be applied to community water systems.**

For each element of the TMF Capacity Criteria contained in this document, an introductory paragraph is given that describes why developing capacity in that area is important. Following this paragraph, a section entitled *Documentation* is included. In order for the Department or the Local Primacy Agency (LPA) to evaluate a water system's ability to comply with a particular TMF Capacity element, the information listed under *Documentation* must be submitted for review. Following the section on documentation, a section entitled *Evaluation* is included that lists the items that will be considered by the Department or LPA in evaluating a water system's TMF capacity.

The Department encourages all public water systems to review the TMF Capacity Criteria contained in this document and to work toward acquiring and maintaining that capacity. To this end the Department will implement a strategy to assist public water systems in meeting these TMF Capacity Criteria. However, these criteria are only required of the systems described below.

New Systems, Systems Changing Ownership and SRF Applicants

The 1996 federal SDWA requires all states participating in the Drinking Water State Revolving Fund (DWSRF) program to obtain legal authority to ensure all new community and nontransient noncommunity water systems demonstrate adequate TMF Capacity before being allowed to commence operation. The 1996 federal SDWA also prohibits any state participating in the DWSRF program from providing financial assistance to any public water system that does not have the TMF Capacity to comply with all SDWA requirements or cannot achieve adequate TMF Capacity with the DWSRF financial assistance.

In response to these federal requirements, Section 116540 of the California Health and Safety Code was enacted. This section states that, "*No public water system that was not in existence on January 1, 1998, shall be granted a permit unless the system demonstrates to the department that*

the water supplier possesses adequate financial, managerial, and technical capability to assure the delivery of pure, wholesome, and potable drinking water. This section shall also apply to any change of ownership of a public water system that occurs after January 1, 1998." **It should be noted that the California SDWA goes beyond the federal requirements by applying the TMF Capacity Criteria to transient noncommunity water systems and to water systems changing ownership.**

The Department will use the Criteria elements contained in this document to assess the TMF Capacity of community water systems. How each TMF Capacity element will be applied to new systems, systems undergoing a change of ownership and SRF applicants is shown in the Applicability Chart given on page 3.

The following designations are used to indicate how each element of the TMF Capacity Criteria will be applied to new systems, systems undergoing a change of ownership, and SRF applicants:

Mandatory: Compliance with element is required at the time a permit or SRF application is submitted, whichever is applicable.

Necessary: Compliance with element will be required within a specified time frame determined by the Department or LPA, taking into account the size and condition of the water system.

Although compliance may not be required at the time a permit or SRF application is submitted, information needed to evaluate a water system's ability to comply with the element must be submitted no later than the application deadline.

Recommended: Compliance with element is considered "good practice" and encouraged, but not required.

TMF Capacity Criteria Applicability Chart
Community Water Systems

	New Systems	Change of Ownership	SRF Applicants
Technical Capacity			
1. System Description	M	N	M
2. Source Capacity Assessment	M	N	N
3. Technical Evaluation			
Item 1) Consolidation Feasibility	M	N	M
Items 2-5) Technical Evaluation	N	N	N
4. Operations Plans	N	N	N
5. Certified/Qualified Operators	N	N	M
6. Training	N	N	N
Managerial Capacity			
7. Ownership	M	M	M
8. Organization	M	M	M
9. Water Rights	M	M	M
10. Planning	M	R	R
11. Emergency/Disaster Response Plans	N	N	N
12. Customer Service Policies	R	R	R
Financial Capacity			
13. Budget Projection	M	M	M
14. Reserves	N	R	R
15. Capital Improvement Plan	M	N	N
16. Budget Control	N	N	N

Applicability may be changed from *Recommended* to *Necessary* or *Mandatory* depending on the size and/or complexity of the water system.

Definitions:

M = Mandatory. Compliance with element is required at the time of application.

N = Necessary. Compliance with element will be required within a specified time frame.

R = Recommended. Compliance with element is encouraged, but not required.

TECHNICAL CAPACITY

1. System Description

"As-built" maps or drawings that show the location of all of the facilities in the system and maps that show the existing and future service areas, sources of supply and contamination hazards, and other critical facilities are essential to the operation of any water system. To be useful beyond the date they are prepared, the water system should have a method to keep the maps updated as changes occur. Knowing the location, type of materials, etc., of water mains or other facilities is necessary in order to check, repair or replace them. Similarly, it is essential during an emergency to know where the isolation valves are.

Applicability: 1) New public water systems: **Mandatory.**

2) Change of ownership: **Necessary.**

3) SRF applicants: **Mandatory.**

Documentation: The water system must submit the following information:

1) A description of the as-built drawings maintained and procedure used to ensure as-built drawings are created for all new facilities. As-built drawings of new facilities must be drawn to scale, show location, size, construction material, and year of installation of each water main or other facility.

2) A map showing the location of the system's existing service area, each water source, treatment facility, pumping plant, storage tank and pressure zone in the system, as well as all distribution system piping.

   For water systems required to complete a ten-year growth projection (see Source Capacity Assessment & Evaluation, page 5), the map must include the projected ten-year growth boundaries.

   For projects involving consolidation, include a physical map of the existing or proposed water system facilities that will be a part of the consolidation. The map should show the combined service area of the proposed consolidation. Based on the type of project, the Department may require a distribution system map to be submitted in order to better evaluate the application.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) The information must describe the as-built drawings maintained by the system and the procedure that has been adopted to ensure all new facilities will have as-built drawings prepared and maintained. The description of as-built drawings that are currently being maintained is for information only. Assessment of capacity is to be based only on the adequacy of the system's procedure for ensuring as-built drawings are prepared and maintained for all new facilities.

2) The service area map(s) must be accurate and include the location of all the water system's physical facilities.

2. Source Capacity Assessment and Evaluation

The purpose of this element is to have each community water system evaluate their anticipated growth and water demand and compare this to the existing capacity of their sources and system to deliver water. This element will allow a water system to understand when changes or additions to their sources are needed and plan accordingly given the lengthy time for developing a new source of supply due to water rights, environmental review and permit requirements. Additionally, the 1996 federal SDWA requires the state to delineate and assess contamination hazards for all sources of supply for public water systems, new as well as existing.

Applicability: 1) New public water systems: **Mandatory.**

2) Change of ownership: **Necessary.**

3) SRF applicants: **Necessary.**

Documentation: The water system must submit the following information:

1) A ten-year growth projection of the water system service area and customer base that is consistent with local land use plans and a ten-year projection of water demand. An analysis of the capacity of the water source(s) to meet this demand must also be included and contain the following information:

   a) Documentation of the amount of water needed to meet current annual and maximum day demand and estimates of the amount of water needed to serve the annual and maximum day demand over the projected ten-year growth period.

   b) Description of sources currently used or proposed to be used in meeting the projected demand.

   c) A plan and schedule to obtain additional water rights, if needed, to serve customer growth for at least the next ten years.

   d) Description of groundwater aquifers used or proposed to be used including groundwater levels and draw down patterns.

   e) The safe yield of all well and surface water sources used to supply the water system.

   f) Existing source pumping and conveyance capacity together with raw and finished water storage.

2) Documentation of procedures used by the water system to assess increasing concentrations in water quality parameters from an evaluation of source water quality monitoring data.

3 For proposed sources, provide a characterization of the water quality, including a comparison with established or proposed drinking water standards.

4) A map of the location and a written description of all major sources of contamination, actual or potential, within the service area or in adjacent areas that could affect the system sources (e.g., waste disposal sites, landfills, feedlots, etc.).

5) For new public water systems: A delineation and assessment of all drinking water sources in accordance with California's Source Water Assessment and Protection (SWAP) Program requirements.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) The water system must demonstrate sufficient water supply or have a plan and schedule to reliably supply current customers and the projected growth over the next ten years. The system must also demonstrate adequate pumping and conveyance capacity or have a plan and schedule to increase existing capacity to meet projected demand.

2) Consistency of growth projections with local land use plans can be demonstrated with documentation from the appropriate local planning authority. This documentation may take the form of permits issued by the local planning agency, CEQA/NEPA certification, or specific written concurrence. New water systems or systems projected to experience significant growth may be required to submit specific written concurrence.

3) The plan and schedule for obtaining additional water rights should define where the additional water will be obtained and an assessment should be made as to whether its likely that the right will be granted. The State Water Resources Control Board (SWRCB), Division of Water Rights, should be contacted if there are any questions about a water system's application for additional water rights.

4) The procedure submitted for assessing increasing concentrations in water quality parameters must clearly enable the water system to regularly review its water quality data for water quality parameter trends.

5) For proposed sources, provide water quality data showing compliance with all applicable drinking water standards.

6) Review the construction of the system water sources in conjunction with types and locations of major sources of contamination.

7) The source assessment for actual/potential sources of contamination must include all required elements of the California Drinking Water Source Assessment and Protection Program.

3. Technical Evaluation

CHSC, Section 116555(c) requires that a public water system provide a reliable and adequate supply of pure, wholesome, healthful, and potable water at all times. For new systems, this determination is part of the permit process. However, for existing community systems, a technical evaluation of the physical facilities and the operation of the system is essential in order to assess the capacity of the system to reliably meet drinking water standards and to properly budget for needed improvements. The evaluation is necessary, not only to assess the condition of existing facilities, but to also project the need for replacement of existing facilities. The technical evaluation will also assess the need for new facilities to accommodate system growth over the next ten years. This will then enable the utility to identify and prioritize improvements needed to reliably comply with existing and projected drinking water standards, develop a prioritized capital improvement plan, and assess finances needed to support the improvements.

Applicability: 1) New public water systems:

Item 1) Consolidation Feasibility: **Mandatory.**
Items 2 - 5) Technical Evaluation: **Necessary.**

2) Change of ownership:

Item 1) Consolidation Feasibility: **Necessary.**
Items 2 - 5) Technical Evaluation: **Necessary.**

3) SRF applicants:

Item 1) Consolidation Feasibility: **Mandatory.**
Items 2 - 5) Technical Evaluation: **Necessary.**

Documentation: The water system must submit the following information:

1) **Consolidation Feasibility** – An assessment to identify all existing public water systems located in the immediate proximity of the existing or proposed water system. The assessment must determine the feasibility of incorporating into an existing water system or being owned, operated or managed by another agency.

2) A technical evaluation of the system facilities with respect to its capacity to reliably meet current and proposed drinking water standards. The evaluation must:

   a) Document the system's ability to comply with the California Waterworks Standards contained in California Code of Regulations (CCR), Title 22, Chapter 16.

   b) Assess all treatment facilities for compliance with applicable regulations, e.g., the Surface Water Treatment regulations (CCR, Title 22, Chapter 17). This assessment must address all regulatory requirements that apply, as well as the treatment facility's ability to reliably produce water that meets the appropriate water quality standards. The capacity of each unit process at a treatment plant must be assessed to determine the limiting flow through the treatment plant.

   c) Assess the source, storage and distribution system's design capacity and operational ability to provide the pressure specified in CCR, Title 22, Section 64566 and including local fire flow requirements. A hydraulic analysis of the transmission and distribution system, to ensure reliable compliance with pressure standards under daily, peak daily and peak monthly demands, must be conducted and included in the evaluation if:

      - The system is proposing to expand its existing distribution system within the ten-year planning period, or

- The system is currently experiencing pressure problems.

A pressure survey of the system would be an acceptable alternative to the hydraulic analysis as long as the plan for conducting the survey is approved by the Department before the survey is conducted.

d) Show that the water system has the ability to accurately and continuously measure the quantity of water produced from each water source, with the exception of emergency or standby sources, in order to determine total production. Information documenting the type of meters used as well as routine procedures carried out to ensure their accuracy must be included. Records showing daily or monthly water production from each source is acceptable documentation.

e) For new public water systems: Describe the design basis of all water system facilities.

For SRF applicants: Describe the design basis of all new facilities to be constructed using SRF loan monies.

3) An evaluation of the condition and remaining service life of existing facilities.

4) An evaluation that identifies all critical facilities and/or equipment whose failure would result in a water outage and/or a water quality failure and the adequacy of the system's plans/procedures for dealing with such failures.

5) A prioritized list of deficiencies and needed system improvements to serve as a basis for a five-year Capital Improvement Plan (CIP).

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) For new public water systems: if connection to an existing system that has adequate TMF capability is physically and economically feasible, and the existing system is willing to serve, the application for a permit to operate as an independent water system should be denied. If the new public water system chooses not to consolidate, the Department may consider approving the application if the new water system will be owned, operated or managed by an existing public water system that has adequate TMF Capacity.

For SRF applicants: all SRF applicants are required to examine alternatives in their project feasibility study in order to ensure that the most cost-effective project is built. Consolidation with other public water systems must be considered as one project alternative. In addition, if the technical evaluation of the water system indicates TMF deficiencies in the areas of management, operation, and/or ability of the system to make necessary public health improvements, the feasibility for consolidation (with an adjacent system with adequate TMF) and/or restructuring (ownership, management, operation) must be examined in the project feasibility study. If consolidation and/or restructuring are feasible and cost-effective, the proposed project must provide for implementation.

In some cases, it may be that consolidation and/or restructuring may be the only feasible way to correct TMF deficiencies but the project itself may not be the least cost solution. In these situations, the consolidation and/or restructuring option should be pursued.

2) In cases of very simple existing systems, the Department/LPA sanitary survey evaluations may suffice for the technical evaluation. The sanitary survey report should be reviewed to determine if it documents all the information required for

this evaluation. Additional information should be requested from the water system if required.

3) All treatment facilities must be fully described along with their purpose. Where specific requirements are given in state law or regulations, the evaluation must clearly show to what degree the facilities comply. An assessment of the facility's effectiveness in reducing the constituent it was designed to remove must also be included. Deficiencies with respect to regulatory requirements or treatment effectiveness must be identified. The capacity of each treatment process must also be specified.

4) The system must submit adequate documentation to show the water system can maintain the pressure specified in CCR, Title 22, Section 64566. This documentation may take a number of forms and does not have to be the same for all parts of the distribution system. A description of physical facilities (e.g., pipe sizes, tank elevations, pump capacities, etc.) may be sufficient to document this. A hydraulic analysis or pressure survey may also be used to document the system's ability to maintain the required pressure. Whatever documentation is submitted must cover the entire distribution system.

5) If a hydraulic analysis is required it must cover all parts of the system where pressure problems are occurring or likely to occur as a result of system expansion. The analysis must clearly document the model used and how the data for it was obtained. In addition, it must specifically state all assumptions used to construct the model and to perform the actual analysis. The hydraulic conditions analyzed must be given and must be realistic to what the system does or will actually experience. The results of at least two conditions analyzed must be validated against actual system conditions.

6) If storage capacity is relied on to maintain pressures during peak demand periods, then the data used to determine the required storage volume must be in the technical evaluation, including historical production and/or use records. All storage facilities must be documented (e.g., location, pressure zone(s) served, capacity of facilities that fill each tank). The storage volume per connection value must be comparable to other water systems in the general area that are in compliance with pressure requirements or an explanation given of why it is different. The storage volume must be sufficient to maintain the pressure specified in CCR, Title 22, Section 64566 throughout the distribution system under maximum system demands. If the system is used for fire protection, the storage volume must also include sufficient storage to provide fire flow.

7) The type of production meters used as well as the procedures used to ensure the meters are giving accurate readings must be included with the documentation. Adequate records of production data must also be submitted to demonstrate the system is recording this data on a regular basis.

8) The design basis for facilities for new public water systems and SRF applicants should include the criteria used that governed the sizing of the facility (e.g., flow rate, loading rate of each unit process for treatment plants, etc.) as well as documentation of the source of the design basis (e.g., Ten States Standards, AWWA or other design handbooks or manuals).

4. Operations Plans

There are numerous activities that are important to the operation and maintenance of a water system where failure to perform them on a routine basis can lead to degradation of the quality of water and result in an increased health hazard. Systems providing any type of water treatment are required to develop a treatment plant Operations Plan. Well managed and operated systems have an Operations Plan that addresses all aspects of water system operation. By developing an Operations Plan, the system is assured that its operators are aware of the activities that need to be conducted to protect the quality of the water and maintain system facilities to assure maximum life. Also, many smaller systems have only one operator position with frequent turnover in personnel. New operators coming on board may not understand the procedures necessary to properly operate and maintain the system. The existence of an Operations Plan provides the necessary guidance for persons unfamiliar with the system.

Applicability:
1) New public water systems: **Necessary.**
2) Change of ownership: **Necessary.**
3) SRF applicants: **Necessary.**

Documentation: The water system must submit the following information:

1) For systems utilizing a surface water source, the water system must have a Department approved Surface Water Treatment Rule Operations Plan.
2) An Operations Plan for any other treatment provided (including chlorination). The plan should address treatment unit operational procedures, process monitoring response to violations, and reporting.
3) A system Operations Plan that addresses how the system will be operated to comply with drinking water requirements and the California Waterworks Standards. Water system managers should develop the Plan with operating personnel and establish procedures to review the plan annually with operators. This plan must not be more than five years old, and as a minimum, must address the following items:
   a) Daily operational practices.
   b) Emergency operational practices.
   c) Flushing dead-end mains.
   d) Storage tank inspection and cleaning.
   e) Main repair and replacement.
   f) Consumer complaint response procedures.
   g) Maintenance and testing of backflow prevention devices.
   h) Inspecting and exercising water main valves.
   i) Maintenance of master flow meters.
   j) Responsibilities of operating personnel.
   k) Operation of all production, transmission and distribution facilities.
   l) Record keeping.
   m) For new water systems: a maintenance plan for all facilities.

For SRF applicants: a maintenance plan for all facilities to be constructed under the SRF program.

4) Procedures to review and update all Operations Plans every five years.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) Plan(s) submitted must be practical and address all of the above elements in sufficient detail to ensure adequate operation of the water system.

2) New water systems must have a system Operations Plan approved by the Department before the system starts operation.

5. Certified/Qualified Operators

The 1996 federal SDWA requires states to comply with guidelines being developed by the United States Environmental Protection Agency (USEPA) for an adequate operator certification program. The guidelines are to be completed by February 1999 and the state then has until February 2001 to comply. The USEPA, in developing these guidelines in cooperation with the National Drinking Water Advisory Council, the American Water Works Association (AWWA), the Association of State Drinking Water Administrators (ASDWA) and other stakeholders, concluded that it was essential that all community and nontransient noncommunity water systems be under the operational control of an appropriately certified operator in order to assure reliable compliance with drinking water standards. Currently, the CCR, Title 17 only requires certified operators for public water systems that provide treatment. This requirement will be changed to be consistent with federal requirements once the USEPA has finalized their guidance. In the interim, all existing systems without treatment that are changing ownership or applying for SRF funding and all new public water systems will be required to have a 'qualified' operator in control of the operation of the system.

Applicability:

a) New public water systems: **Necessary.**

b) Change of ownership: **Necessary.**

c) SRF applicants: **Mandatory.**

Documentation: The water system must submit the following information:

1) For existing or proposed water treatment plants, the name and grade of certification of each operator that will be operating the system.

2) Where treatment is not provided, the name and qualifications of each person that will be operating the system.

3) If the operator(s) have not been hired, a plan and schedule for hiring one.

4) A description of relevant training and experience that persons responsible for the operation of the water system have received.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) All public water systems with existing water treatment plants must demonstrate that they comply with current state operator certification regulations. Systems proposing new water treatment plants must demonstrate that they will have an appropriately certified operator prior to commencement of the operation of the treatment facility.

2) Small Rural Exception: If the system is located in a remote area, it may propose to employ a person who holds or obtains a Limited Certificate as provided in CCR, Title 17, Section 7118. In this case, information provided must demonstrate that the person is qualified to operate the specific treatment and distribution facilities.

3) If the public water system has no treatment plant (e.g., distribution only or untreated groundwater source), they must have operator(s) 'qualified' to operate the system in accordance with state requirements. For a water system with no treatment, a 'qualified' operator is defined as one that has received the AWWA Distribution Operator Certification or has at least one year of training or experience appropriate to the type and size of the system in question.

6. Training

Competent management and operation of a public water system is critical in providing a safe and reliable water supply to system customers. This task has become extremely complex over the last 15 years. With adoption of new drinking water standards and increased emphasis on consumer education and involvement, the job can be expected to become even more complex over the next decade. In order to competently comply with existing requirements and stay current with new requirements, new technologies, and newly identified hazards, all water system personnel must be committed to maintaining an adequate level of training through continuing education.

Applicability: 1) New public water systems: **Necessary.**

2) Change of ownership: **Necessary.**

3) SRF applicants: **Necessary.**

Documentation: The water system must submit:

A plan for keeping the management and operators current with the requirements of managing and operating a water system. This plan can be submitted as part of the water system's Operations Plan.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) Managers of public water systems should continue to receive training in utility management, drinking water regulations and resource management (e.g., personnel, budget and facilities) in order to effectively manage public water systems.

2) Any person operating a public water system of any type must continue to receive training appropriate to the type and size of the system.

MANAGERIAL CAPACITY

7. Ownership

In order to determine accountability for compliance with California SDWA requirements, the owner(s) of the water system must be clearly identified. The state grants the authority for an organization, city or town, authority, cooperative, corporation or other entity to provide water to the public. State law, which specifies both the procedures for creating the entity as well as the powers, duties, and responsibilities of that entity, generally grants this authority. Documents that form the legal basis of the system's existence prescribe the conditions under which the system may legally operate and provide the framework for the operation and functioning of the water system. It is essential that the water system management understand the authority for their entity and any limitations/conditions of that authority. It is also essential that the system demonstrate that they own or control the facilities necessary for the operation of the system.

Applicability:

1) New public water systems: **Mandatory.**
2) Change of ownership: **Mandatory.**
3) SRF applicants: **Mandatory.**

Documentation: The water system must submit the following information:

1) Description of the type of system ownership (e.g., sole proprietorship, partnership, corporation, mutual, governmental agency) along with the name(s), address(es), and phone number(s) of the owner(s).
2) If the water system is under temporary ownership (e.g., a developer), the eventual ownership and timing for the change in ownership must be described.
3) If land or major facilities that are essential to the reliable operation of the water system are not legally owned by the water system, the terms of the agreement for the long term use of the land or facilities must be described. Examples of the type of agreements that must be described include easements for facilities on land not owned by the water system and agreements for the use of or leases for treatment facilities.
4) The owner of the water system must list all public water systems that are currently or have previously been owned by the applicant (solely or in partnerships, as corporations, etc.) Applicants must also list any water system that they previously operated or are currently operating under contract for another owner or entity.
5) In the case of a sole proprietor, a plan must be submitted that details how the system will continue to be operated in the event the owner becomes incapable of carrying out this responsibility.
6) Disclosure of any encumbrances, trust indentures, bankruptcies, decrees, legal orders or proceedings or other items that may affect or limit the owner's control of the water system.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) The ownership must be a legal entity empowered by the State of California tc manage and operate the public water system.

2) The duration of agreements for use of land or facilities not owned by the water system must be sufficient to ensure that the water system can continue to operate its facilities, providing an uninterrupted and reliable source of water to its customers.

3) If the documentation submitted by the water system does not clearly show who the owner is and that the system has a legal right to the use of land and facilities (essential to the operation of the water system) that it does not own, then the applicant should be asked to supply a letter from their attorney giving this information and certifying the system's legal authority.

8. Organization

A clear description of the organization, including a functional organization chart, is essential for every water system. This establishes the lines of authority and communication between employees and management and helps to avoid confusion, mistakes, or misunderstandings in the daily operation and management of the system. It is also essential to define the respective roles of each person to avoid duplication and confusion, and to ensure that all essential functions are covered. Since small water systems may have a single individual performing multiple functions, it is also important to identify the percentage of time allocated to each function in order to ensure that each function is adequately covered.

Applicability: 1) New public water systems: **Mandatory.**

2) Change of ownership: **Mandatory.**

3) SRF applicants: **Mandatory.**

Documentation: The water system must submit the following information:

1) Organization chart.

2) A complete description of the reporting relationships and primary responsibilities of all key personnel (including boards of directors or councils, employees and contract personnel) that will be involved in the management or operation of the water system. Information that shows how the organization functions, including who is responsible (name, position and title) for policy decisions, for ensuring compliance with state regulatory drinking water requirements and for day to day operations of the system. The responsibilities of operating personnel should be defined. For systems with boards or councils, the frequency of meetings must be specified.

3) If the person in charge of the operation has other responsibilities unrelated to the water system, the information must show the amount of time the operator will spend on water system operation. The Operations Plan may be used as part of this demonstration.

4) A description of the relevant training and experience that persons responsible for the management of the water system have received.

5) A description of how legal, engineering and other professional services are provided.

6) If a system contracts for management and/or operation of their system, a copy of the contract or summary of the contractor's duties and responsibilities must be provided, which must also include the amount of time to be spent performing the specified duties at this water system.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) The information must clearly indicate how the organization functions, who is responsible for policy decisions, for ensuring compliance with state regulatory drinking water requirements and for day to day operations of the system. Information that indicates a confusing and/or diffused primary responsibility may indicate a need for restructuring the water system management or operation to comply with this TMF Capacity element.

2) Persons responsible must have sufficient time dedicated to reliably manage and operate the water system. For operators, this can be demonstrated by an analysis of the time it will take to operate all water system facilities, including treatment

plants, on a routine basis compared to the time the operator is allocated to the water system. The system Operations Plan can be used to define the responsibilities of the operating personnel and to demonstrate adequate operator time dedicated to the water system as well as adequate number of operators.

3) If management and/or operation of the system are contracted, details must be provided which demonstrate that the water system can be reliably operated. The contract must define the functions the contractor will undertake and how much time they are devoting to it.

4) A copy of the system's incorporation articles, by-laws or governing ordinances should be requested, if necessary, to obtain a clear picture of the functional responsibility and authorities within the organization.

9. Water Rights

It is essential that the water system has a legal right to the quantity of water necessary to assure an adequate and reliable drinking water supply. This must be demonstrated for a new public water system and for systems changing ownership. For an SRF applicant, a demonstration of adequate water rights is required if the project being funded by the SRF program is dependent upon that right. A written copy of the water right (permit, license or other agreement) should be maintained as a part of the system records.

Applicability: 1) New public water systems: **Mandatory.**

2) Change of ownership: **Mandatory.**

3) SRF applicants: **Mandatory.**

Documentation: The water system must submit the following information:

1) Information that describes the legal basis and authority for diversion or extraction of water. If groundwater is being pumped from a groundwater basin that has not been adjudicated, a statement to that effect is sufficient documentation to satisfy this requirement.

2) If the source water is subject to permit requirements under the SWRCB, a copy of the water rights permit must be included.

3) Approval for extraction of water from an adjudicated groundwater basin must be demonstrated by confirming documents from the basin watermaster.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) The applicant has the responsibility to verify the legal basis and authority for diversion or extraction of water.

2) The water right must be sufficient to provide water for current users (taking into consideration other water sources such as those from unadjudicated groundwater basins).

3) If the documentation provided to demonstrate the system's water right is unclear, the system should be requested to provide a letter of confirmation from the authority that granted the water right.

10. Planning

With the exception of state, federal and tribal lands, all land uses as to type, extent and timing are controlled by units of local government (city and county). As such, these units of local government are required by state law to develop and ensure implementation of growth management plans to assure development that is consistent with state requirements for their areas of jurisdiction. These plans define land uses and include elements and/or policies for utility services. In addition, local governments often are the most knowledgeable of past, present and future land uses that could affect the quality of the system's drinking water supply.

In order to ensure consistency with local government planning and to accurately delineate land uses that could affect drinking water sources, utilities are required to seek review and comment from local planning authorities on their growth projections, including water demands and service areas, and on the source water hazard inventory required by California's SWAP program.

Applicability: 1) New public water systems: **Mandatory.**

2) Change of ownership: **Recommended.**

3) SRF applicants: **Recommended.**

Documentation: The water system must submit information that demonstrates compliance with appropriate land and water use plans adopted by the county in which the water system is located.

Evaluation: The following is to be considered in evaluating this TMF Capacity element:

Permit applications that do not demonstrate consistency with adopted city or county plans may be denied unless the city or county approves a variance.

11. Emergency/Disaster Response Plans

It has been the experience of the Department, with the multitude of major disasters in California over the last ten years, that many of the systems impacted by disasters have since taken steps to expand their required Emergency Notification Plan to include a Disaster Response Plan (who, how, and when) and to establish communication links with other utilities, agencies, and emergency service providers. As a result, they are much better prepared to continue minimum service levels and mitigate the public health risks from drinking water contamination that may occur during a disaster or other emergency event. In order to provide reliable water service and minimize public health risks from unsafe drinking water during emergencies, water systems will be required to have a plan that defines how it will respond to emergencies and/or disasters that are likely to affect its operation.

Applicability: 1) New public water systems: **Necessary.**

2) Change of ownership: **Necessary.**

3) SRF applicants: **Necessary.**

Documentation: The water system must submit an Emergency/Disaster Response Plan with clearly defined . response procedures . The plan must:

1) Address all disasters/emergencies that are likely to occur in the water system's service area. As a minimum, all water systems must address earthquake and major fire emergencies. Other potential emergencies that may occur in a water system's service area include flooding, water outages and water contamination.

2) Designate responsible personnel and provide a clear chain of command and identify responsibilities.

3) Include an inventory of system resources that are used for normal operations and available for emergencies. This information should include maps and schematic diagrams; lists of emergency equipment; equipment suppliers; emergency contract agreements; and emergency water interconnections and/or sources.

4) Include a communication network, appropriate to the size and type of water system, that describes a designated location for an emergency operations center; emergency contact information for equipment suppliers; emergency phone and radio communication capabilities; coordination procedures with governmental agencies for health and safety protection, technical, legal, and financial assistance; and public notification procedures.

5) Include emergency procedures to quickly assess damage to water system facilities; provide logistics for emergency source activation and repairs; monitor progress of repairs and restoration; communicate with health officials and water users; and document damage and repairs.

6) Describe the steps that will be taken to resume normal operations and to prepare and submit reports to appropriate agencies.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) Plans submitted must address all of the above elements in sufficient detail to ensure adequate system response during an emergency.

2) Does the system belong to an emergency mutual aid organization? How much assistance can this organization actually provide in the event of an emergency in the water system's service area?

12. Customer Service Policies

A basic management responsibility of a water system is to develop and enact policies affecting the water system operation and to communicate them to the customers they serve. These policies define the conditions under which water service is provided, the water system responsibilities to the customer, the customer responsibilities, and conditions under which mains will be extended to new customers. As a result, they greatly enhance the communication with and the support of customers, as well as improving the operation of the system.

Applicability: 1) New public water systems: **Recommended.**

2) Change of ownership: **Recommended.**

3) SRF applicants: **Recommended.**

Documentation: It is recommended that the water system submit its written polices governing operations. At a minimum these policies should define the conditions for obtaining new service and the purveyor/customer responsibilities.

1) **Conditions for new service.** This includes such items as annexation (is it required in order to obtain service); wheeling water (if the system allows its mains to be used to deliver water to another system, what conditions must be met to safeguard quantity/quality for existing users); developer extensions (who pays, financing, engineering, etc.); design standards (if different than California Waterworks Standards); fire protection (if the water system is located within an urban growth area it may be necessary to provide fire protection and meet other more stringent requirements for urban service).

2) **Purveyor/customer responsibilities.** These should clearly define the responsibility of both the customer and the purveyor with respect to accessing needed facilities for inspection, repair, maintenance, water quality monitoring, complaint reporting/follow-up, payments, cross-connection hazards, meters, etc.

Evaluation: Compliance is optional on behalf of the utility. The Department may assess a water system's need for such policies, make recommendations on the basis of that assessment, and provide assistance where appropriate.

FINANCIAL CAPACITY

13. Budget Projection

The budget projection is a written financial plan for the operation of the water system over the next five years. This is a critical feature of the TMF capacity assessment because it indicates whether the system's revenues and reserves will meet the system's expenses. It also is a necessary tool that will enable the water system to plan for future needs. The budget is the primary source of information for monitoring and controlling costs/expenses and ensuring the availability of adequate resources to meet the costs of operating the system. It also serves as an effective communication tool with consumers as to the full costs of providing safe, adequate, and reliable drinking water. Without this budget projection, there is no basis for judging how the system is doing financially or whether it will be able to meet future needs.

Applicability: 1) New public water systems: **Mandatory.**

2) Change of ownership: **Mandatory.**

3) SRF applicants: **Mandatory.**

Documentation: The water system must submit the following information:

1) A detailed projection of anticipated revenues and expenditures for at least a five-year period. The budget projection shall also include the projected expenses to be incurred as a result of implementing the water system's CIP and its equipment replacement schedule and maintenance of equipment replacement reserves.

2) A consolidated financial statement (e.g., balance sheet and income statement) from the previous three years.

3) A copy of the current rate structure and the average annual cost of water per customer for the previous calendar year. For new public water systems: provide the proposed rate structure and estimated annual cost of water per connection.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) The analysis must indicate that rates combined with other revenue sources are sufficient to cover all listed expenditures. If the proposed revenues are overstated or the expenditures understated, based on the previous two years of actual data additional justification/information should be required.

2) Future anticipated revenues that are contingent upon a vote of the system users are generally not considered assured sources of revenue.

3) If anticipated revenues are based on an assumed "build-out" projection, this projection should be evaluated for reasonableness. In doing this, consultation with local planning authorities may be necessary. It may also be appropriate to require acquisition of a performance bond and include specific conditions in the permit as necessary.

4) If revenues are not sufficient to cover the proposed expenditures, the water system must submit a plan to increase revenues to cover expenditures.

5) For investor owned systems: the California Public Utilities Commission's review of the budget plan will be required.

14. Reserves

The CHSC, Article 3, Section 116375(g) requires the Department to adopt rules defining the minimum financial assurances necessary to demonstrate the water system's ability to provide for the ongoing operation, maintenance and emergency replacement of a major capital facility (e.g., a well or other source of supply, key transmission lines, or the largest piece of pumping equipment). Since it is common for small water systems to experience cash flow shortfalls due to lags in revenues or unanticipated expenses for emergencies, this element requires the water system to deal with this problem by establishing a reserve account or debt authority (e.g., trust fund, surety bond, letter of credit, insurance, etc.) sufficient to fund unanticipated shortfalls.

Applicability: 1) New public water systems: **Necessary.**

2) Change of ownership: **Recommended.**

3) SRF applicants: **Recommended.**

Documentation: The water system must submit the following information:

1) Description of a reserve account identified to finance emergency replacement of critical facilities that may fail.

2) Description of an operating reserve identified to maintain cash flow.

Reliability features, mutual aid agreements, etc. can be used to minimize the amount of reserve accounts.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

Information submitted should provide adequate assurance that sufficient funds will be available to continue the effective operation of the system in the event of some unforeseen emergency requiring the expenditure of funds above and beyond those anticipated. The use of backup reliability features may be used as acceptable alternatives to actual emergency cash reserves where appropriate. The emergency reserve funding should be consistent with the water systems disaster response plan.

15. Capital Improvement Plan/Equipment Replacement

The CHSC, Article 3, Section 116375(g) also requires the Department to adopt rules that define the minimum financial assurances necessary for water systems to demonstrate their capability to provide for the upgrading of the system. The development of a prioritized CIP is a common way for water systems to demonstrate this capacity. Improvements would be those necessary to resolve deficiencies identified in the technical evaluation as well as those necessary to accommodate growth in the system's service area. The financing plan for the CIP is then reflected in the systems operating budget in order to fully assess the financial capabilities of the water system.

The equipment (e.g., pumps, controls, valves, pipes, etc.) in every public water system have a useful life and will eventually require replacement. Frequently, systems that fail to maintain reserve accounts or debt authority are unable to replace old, worn out equipment on a timely basis. Depending on the piece of equipment that fails and the timing, this can create significant public health risks. This element requires the utility to identify a proposed schedule for replacement and to begin building a replacement reserve to fund routine replacement of equipment, hopefully before it fails and creates a health hazard. If this account were not funded, it would have to be reflected in the system's CIP.

Applicability:

1) New public water systems: **Mandatory.**
2) Change of ownership: **Necessary.**
3) SRF applicants: **Necessary.**

Documentation: The water system must submit the following information:

1) A prioritized CIP based on the results of the Technical Evaluation (TMF Capacity Criterion No. 3). Any facilities requiring construction within the five-year budget period should be identified with proposed sources of funding. (e.g., bonds, loans, grants, increased rates, etc.). This plan should be reflected in the five-year budget plan.
2) Description of the method that the water system will use to develop the funds to replace old and outmoded equipment, facilities, and pipes in the system. The estimated useful life of major system components must be specified.

Evaluation: The following are to be considered in evaluating this TMF Capacity element:

1) The Department will use its' sanitary survey of the water system and engineering expertise to judge the adequacy of the plan.
2) For new public water systems: Depending upon the type of system proposed several replacement methods may be satisfactory including an identified sinking fund, capital reserve account, access to financial capital, bonds, etc. It is important that the applicant has planned for a reasonable method for replacing equipment as needed.

16. Budget Control

The budget of a water system is basically a financial plan for the existing and future operation of the water system. It is essential that the budget be adhered to or consciously modified to reflect a change in direction. In order to accomplish this, the water system must establish budget controls and procedures for reporting to appropriate levels of authority. There must be periodic reviews of the budget status and modification of the budget if necessary. This will ensure that revenues are collected, expenses are controlled, and reserve accounts are maintained.

Applicability: 1) New public water systems: **Necessary.**

2) Change of ownership: **Necessary.**

3) SRF applicants: **Necessary.**

Documentation: The water system must submit the following information:

1) A description of the water system's budget control and reporting procedures established to ensure continuing financial viability of the system.

2) A description of the water system's control procedures established to ensure that there is no commingling of revenue sources (e.g., moneys from the SRF) that is prohibited by state and federal law.

Evaluation: The following is to be considered in evaluating this TMF Capacity element:

The information to be submitted must be provided by a Certified Public Accountant or appropriately qualified financial officer of the water system. The information should describe the budget control procedures in sufficient detail to provide assurances to the Department that the manager/owner of the system will receive the necessary budget information on a timely basis to ensure continued delivery of a safe, adequate water supply.

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