APPENDIX B - AWWA POLICY ON REGIONALIZATION OF WATER UTILITIES

Adopted by the Board of Directors June 15, 1980, reaffirmed Jan. 25, 1987, revised Jan. 31, 1993 and June 21, 1998

The American Water Works Association (AWWA) encourages water utilities to identify local and regional solutions to resource management and water supply service needs. If a regional program is necessary or desirable, water utilities should work with the appropriate levels of government to develop the program and promote the use of good utility management principles. State, provincial, territorial, and federal agencies are encouraged to support local government efforts to develop a regional program and ensure equitable benefits to all water utilities.

AWWA recognizes the importance of water utility management that supports community needs consistent with resource management programs. At the same time, AWWA emphasizes the need to manage all utilities as self-sustaining organizations whose management structures have been developed at the local level. Local, regional, state, and federal entities must integrate policies that relate to the regional needs of utility management, source development, or planning programs.

The economic effect of the 1986 Safe Drinking Water Act Amendments is significant. All utilities face additional monitoring and capital costs, and small water systems may not be able to afford critical public health improvements. Regionalization of water supply service, either through physical connections or management structures, may provide economies of scale and reduce the costs of water services.

AWWA values the protection and efficient use of natural resources. Regional water supplies may increase water use efficiency, promote water conservation, minimize capital investment, and enhance source protection.

AWWA believes that some needs may best be met by cooperative efforts on a regional basis. No single approach or mandate, however, should be applied universally. A good utility management program will include an evaluation of all issues and approaches and will implement those regional programs necessary to meet the needs of the communities being served.

AWWA defines a regional water system as a management or contractual administrative organization or a coordinated physical system plan of two or more community water systems using common resources and facilities to their optimum advantage.

The concept of regionalization applies but is not limited to:

1) an urban complex of water systems with a plan to minimize duplication, identify future service areas, maximize cooperation between utilities with major emergency interconnections, and establish mutual aid pacts; or
2) a group of rural or suburban water systems that could obtain economies of scale under a common management structure.

When considering the need or desirability of a regionalization program, planners should use good utility practice as a guide.

APPENDIX C - AWWA WHITE PAPER ON BUILDING WATER SYSTEM VIABILITY

Approved June 28, 1995. Executive Summary Published September 1995 in AWWA Mainstream

Executive Summary

The viability of drinking water systems is critical to the protection of public health and the conservation of public resources. With the increasing complexity of water treatment and environmental conditions and more stringent drinking water regulations, the ability of water systems to provide water that meets all quality requirements and is sufficient in quantity is being challenged. Some systems have already failed; others are struggling. Even systems with the financial, technical, and operational capability to meet current demands may have eventual difficulty unless they anticipate the future needs of their customers and of water quality regulations.

Defining Water System Viability

Water systems can be classified in three categories, according to their capacity--or organizational, technical, and economic ability--to provide safe, affordable drinking water over the long term: viable systems, gray-zone systems, and nonviable systems.

Viable systems **-** Viable systems are self-sustaining systems that can reliably meet all present and future requirements in a dynamic, comprehensive manner that assures the continued delivery of safe water. A key tool for a viable system is a master plan that includes a facilities plan, a management plan, and a financial plan showing how the system meets and will continue to meet performance requirements.

Gray-zone systems - Gray-zone systems may or may not have the ability to meet present and future requirements in a reliable manner. They cannot be classified as viable or nonviable because their lack of comprehensive water supply planning does not allow adequate assessment.

Regulatory compliance is a primary measurement of performance, but alone is not a sufficient criterion for determining viability. Gray-zone systems with compliance problems may have the potential to overcome these problems as they implement a comprehensive approach to improved operations, management, and financing.

Nonviable systems **-** Nonviable systems clearly do not have the ability to meet present or future needs without significant restructuring of their approach to providing water service. They present a danger to public health, and their limitations erode public confidence in public water supplies.

Nonviable water systems are the result of a variety of conditions: population settlement patterns, development constraints, demographic and economic changes, management limitations, inadequate maintenance and modernization, and failure to recover the full cost of service.

Existing State Programs

Because states are the level of government with primary oversight of drinking water operations, viability can best be addressed at the state level by governors, legislators, and other policy makers. Action by states to provide the authority and funding for viability programs will render unnecessary any federal mandate for such programs.

A number of states--Washington, Connecticut, and Maryland, for example--have enacted legislation to prevent the proliferation of nonviable systems and reduce problems caused by existing nonviable systems. Each legislative package was developed to respond to a particular state's relationship with the water purveyor, customer, regulator, and legislative environment and addressed concerns about land use, water rights, property rights, and other issues.

Objectives for Viability Initiatives

The primary goal of viability initiatives or programs is to minimize the number of nonviable systems. Such a program seeks to usher as many water systems as possible out of the "gray zone" and into the viable category, prevent the formation of new water systems that do not demonstrate assurance of their viability, and assist nonviable systems in restructuring.

In terms of public benefits and costs, it is much less expensive to encourage viability than to cope with nonviable systems. There may be thousands of water systems that can become viable with the right assistance.

The key factor in assessing viability is a water system's ability to implement changes on its own initiative, as opposed to externally facilitated restructuring. Externally imposed restructuring of nonviable systems is difficult, expensive, and legally complicated, even in states where such authority, programs, and resources already exist.

Viability assessment - A major tool for determining a water system's capabilities is a viability assessment. Usually a state-managed process, a viability assessment attempts to identify nonviable systems and provides system owners, operators, and customers the information needed to discern strategies to pursue and maintain system viability. A state viability assessment process sets requirements for master planning, criteria for review, and follow up procedures to assess implementation and performance.

Timing of viability assessment - Ideally, water system master planning is a continuous and voluntary process. A viability assessment could be required when there is a need to raise capital for purposes of compliance, expansion, or rehabilitation. Such a requirement could logically be made a part of the application for state or federal financial assistance or the state primacy agency's process for approving engineering plans and specifications of new construction or major modification of drinking water facilities.

Criteria for evaluating viability assessment - The most fundamental measure of viability is a system's ability to bring in more money than it will spend to provide reliable water service. Without a multiyear capital and operating budget, balancing revenues and expenses based on a comprehensive needs assessment, a water system plan is incomplete.

Preventing the formation of nonviable water systems

The objective of viability screening for proposed systems is the same as that of viability assessment for existing gray-zone systems--to minimize the number of systems that may eventually become nonviable. States may need to amend state drinking water laws to require the submission of a multiyear financial plan, in addition to engineering plans, for system approval.

Restructuring Nonviable Systems

The most difficult aspect of a viability program is resolving nonviable situations. Ultimately, the problems of nonviable systems may be brought to a head because of failing infrastructure and increasing SDWA enforcement actions. Nonviability is not simply a problem of drinking water enforcement policy; it encompasses broader issues important to the health and well being of the community--infrastructure, economic stability, rural development, and poverty.

The restructuring solutions include an array of choices: contract operation and maintenance, merger or consolidation, satellite management, purchased water interconnection, formation of water districts or authorities, privatization, and public acquisition. Some legal and programmatic changes may be needed to allow new institutional approaches. AWWA recommendations include:

1. Viability initiatives should be developed to assist as many water systems as possible in identifying and attaining long-term reliability and to assist nonviable systems in restructuring their approach to providing water service. Sources of assistance include AWWA, the National Rural Water Association, the Rural Community Assistance Program, state and federal agencies, and private consultants.
2. Each state should develop a viability assessment process, incorporating master planning for utilities, that will identify necessary changes in management, finance, and operations to reliably meet all present and future requirements and achieve financial self-sufficiency. Only in nonviable situations should financial aid be considered.
3. States should perform a comprehensive review of barriers and incentives embedded in state and local laws, regulations, and programs that encourage formation of new nonviable water systems or hinder the restructuring of existing water systems into more viable entities.
4. States should seek input from AWWA sections, water utilities of all sizes, municipal leagues, the public, and other interested parties in developing viability initiatives.

The complete white paper follows.

BUILDING WATER SYSTEM VIABILITY

A White Paper from the American Water Works Association

(Approved June 28, 1995).

The American Water Works Association (AWWA) has adopted three principles for drinking water:

- safe and sufficient drinking water for all people,
- total and responsible water management, and
- customer confidence and satisfaction.

In striving to achieve these goals, all water systems should continually evaluate their performance and their ability over time to provide a safe and dependable supply of drinking water to their customers.

Water systems are facing a more complex environment and more stringent regulations for which a high level of performance must be maintained. As a result, some water systems that were once viable are now struggling to sustain their ability to provide an adequate quantity and quality of water to their customers. Systems lacking the financial, technical, and operational capability to meet current demands may have difficulty meeting the future demands of their customers and of increasing water quality standards. More water systems may be overwhelmed by changing conditions if they do not anticipate and prepare for future needs.

Informed decision making, proper water treatment, efficient distribution system operation, and adequate protection of water supply sources are critical elements in the routine delivery of safe drinking water. Each community is responsible for the safety of its drinking water. Community and utility understanding of the scientific and health information about drinking water and the related cost/benefit issues are important to the public support for maintaining the ability to continually deliver safe and affordable water. When necessary, a system must improve to meet safe drinking water standards; standards should not be lowered so that a system can meet them.

Recommendations

1. Viability initiatives should be developed to:

    - assist as many water systems as possible in identifying and attaining viable status, i.e., long-term reliability. Sources of assistance include AWWA, the National Rural Water Association, the Rural Community Assistance Program, state and federal agencies, and private consultants.
    - usher as many water systems as possible out of long-term instability, the "gray zone," and into long-term reliability, viability.
    - assist nonviable systems in restructuring their approach to providing water service.

2. Each state should develop a viability assessment process, using master planning for utilities, that will:

    - identify needed internal changes in management, finance, and operations;
    - develop a financial, managerial, and operational plan of how the utility will reliably meet all present and future requirements; and
    - plan for financial self-sufficiency over the long term. Only in nonviable situations should aid be considered.

3. State governors and legislators should provide the additional authority and resources to support institution of viability assessment processes. In the long run, encouraging viability is much more cost-effective than coping with a proliferation of nonviable water systems.

4. State governors and legislatures should perform a comprehensive review of barriers and incentives embedded in state and local laws, regulations, and programs that encourage formation of new nonviable water systems or hinder the restructuring of existing water systems into more viable entities.

5. State policies should strive to encourage water systems to identify their most viable options for the future and to restructure relevant aspects of state government to make available the widest possible array of viable options.

6. Problems with nonviable water systems, such as chronic noncompliance with Safe Drinking Water Act (SDWA) regulations, threaten public health and are damaging to public confidence in water supplies. Noncompliance is a manifestation of broader issues than drinking water policy. Solutions will require new policy initiatives to address underlying issues of social policy, economic development, and poverty.

7. AWWA will support state viability initiatives through its publications, technical and management information sharing, and networking of the association membership.

States should seek input from AWWA sections, water utilities of all sizes, municipal leagues, the public, and other interested parties in developing their viability initiatives.

Defining Water System Viability

Water systems can be classified in three categories, according to their capacity to provide safe, affordable water over the long term: viable systems, gray-zone systems, and nonviable systems.

Viable systems - Viable systems are self-sustaining systems, that meet all present and future requirements in a dynamic comprehensive manner that assures continued delivery of safe drinking water.

A viable water system has the commitment and financial, managerial, operational, and technical capability to meet performance requirements for the provision of safe drinking water reliably on a long-term basis.

Viability can be demonstrated through the development of a comprehensive water supply master plan that includes a facilities plan, a management plan, and a financial plan showing how the system meets and will continue to meet performance requirements.

The development and use of such plans by individual water systems is a best management practice. Many very small systems will need technical assistance to undertake comprehensive planning.

Gray-zone systems **-** Gray-zone systems may or may not have the ability to meet present and future requirements in a reliable manner. They cannot be classified because of the lack of comprehensive water supply planning and certainty of future financial and managerial capabilities.

Nonviable systems - Nonviable systems clearly do not have the ability to meet present or future demands without significant, externally facilitated restructuring of their approach to providing water service.

This set of definitions reveals a dilemma: without a comprehensive water supply planning process, it is impossible to tell whether gray-zone systems will eventually become viable. The difference is significant. The proliferation of nonviable systems threatens public health, erodes public confidence in public water supplies, and is difficult to redress. Within the gray zone, thousands of water systems can move into the viable category with the right actions but risk slipping into the nonviable category without such effort.

SDWA compliance is a primary measure of performance, but alone is not a sufficient criterion for determining viability. Gray-zone systems with compliance problems may have the potential to overcome these problems as they develop comprehensive water supply plans, implement concrete improvements, and become viable. Alternatively, gray-zone systems without compliance problems may have the potential to slip into nonviable status without a comprehensive water supply planning process.

Objectives for Viability Initiatives

The key factor that separates viable and nonviable systems is the capability of a system to implement changes indicated by a planning process on its own. External restructuring of nonviable systems requires intervention with extraordinary financial resources and legal authority that do not presently exist in many states. Such restructuring is difficult, expensive, and legally complicated, even in states where such authority already exists.

The primary goal of viability initiatives should be to minimize the number of nonviable situations and to address those that cannot be avoided. The objectives for viability initiatives can be summarized:

- Usher as many water systems as possible out of the gray zone and into the viable category.
- Prevent the formation of new water systems without the assurance of viability.
- Assist nonviable systems in restructuring their approach to providing water service.

Viability assessment - Viability assessment is a formal process aimed at identifying nonviable systems and moving as many systems as possible out of the gray zone and into the viable category. Substantively, a viability assessment is the same as a water system master plan, providing system owners, operators, and customers the information needed to identify strategies to pursue and maintain system viability. A viability assessment process sets requirements for master plans, criteria for their review, and follow up procedures to determine if the plans are being implemented.

If a viability assessment process reveals the need for changes, successful implementation of such changes begins with an understanding of needed changes by system owners, operators, and customers. They are important participants in viability assessments.

Timing of viability assessment - Ideally, water system master planning is a continuous and voluntary process undertaken by system owners, operators, and customers and resulting in adequate implementation. Technical assistance providers-- including AWWA and its sections, the National Rural Water Association, the Rural Community Assistance Program, and state and federal agencies--can and should encourage many water systems to adopt their own routine practice of master planning.

Although outreach and technical assistance programs may not be adequate to reach all water systems, a viability assessment requirement could be established when there is a need to raise new capital--take on new debt--for purposes of compliance, expansion, or rehabilitation. Such a requirement could logically be inserted into ongoing programs in the application process for state or federal financial assistance or in the state primacy agency's approval process for engineering plans and specifications of any new construction or major modification of existing drinking water facilities.

Under the first option, the nature of the review would be merely an extension of the standard credit evaluation to which applicants for financial assistance are subjected. Lending agencies have become more cognizant of the long-term reliability of a system as a financial risk factor to be taken into account. Funding agencies may require additional resources to add viability reviews to the existing application processes.

Under the more encompassing second option, the caseload of reviews would be the same as the existing caseload of engineering plan reviews by the state primacy agency. With adequate provision for additional resources within the state primacy agency, viability reviews could be folded into that ongoing review process.

The potential for collaboration between state primacy agencies and funding agencies in conducting viability reviews exists. Funding agencies possess financial expertise; primacy agencies possess engineering expertise. Any application for financial assistance could require coordinated approval from the primacy agency. Funding agencies and primacy agencies may require explicit legislative affirmation of their responsibilities as well as additional resources in order to add viability assessment to their existing review processes.

Additional resources need to be devoted to technical assistance programs to facilitate a viability assessment program. There may be thousands of water systems within the gray zone that can become viable with the right assistance.

States are the logical authorities for viability programs because they are already responsible for the review of engineering plans for water systems and for most of the technical assistance provided directly to water suppliers. Prudent management and financial planning for a water system is as important to the assurance of public health protection as the engineering planning, facility development, and operational procedures are for the system. Provision of financial assistance to water systems without accompanying assurances of management and financial discipline is counterproductive.

In terms of public benefits and costs, it is much less expensive to encourage viability than it is to cope with nonviable systems.

Criteria for viability assessment - The most fundamental criterion is the ability of a system to bring in more money than it will spend to provide safe water. A system can demonstrate its ability through a multiyear capital and operating budget, based on a comprehensive needs assessment (conceivably, a one-page worksheet), showing that projected revenues equal or exceed projected expenses. Without this budget balancing revenues and expenses, a water system plan is incomplete.

The requirement for a water system plan with a balanced budget forecast over a set period promotes increased reliability. Systems in the gray zone will be guided to viable strategies because the planning exercise will make them better aware of future needs, and the plans will be public, available to customers and the lending community.

The state does not need complicated authority for review of plans if the basic evaluation criteria is completeness. The state's main job would be to audit the cost analysis to ensure realism and incorporation of future compliance infrastructure and resources in the projected revenues and expenses. If a plan is incomplete, the state can work with the system until a complete plan has been submitted. This is a role that can also be usefully fulfilled or supplemented by technical assistance providers unaffiliated with state government, such as AWWA members and sections, the National Rural Water Association, the Rural Community Assistance Program, and private consultants.

Preventing the Formation of Nonviable Water Systems

The objective viability screening for proposed systems is the same as that of viability assessment for existing gray-zone systems--to minimize the number of systems that may eventually end up in the nonviable category.

Because of land use development issues, state drinking water laws may need to be amended to allow the requirement of a multiyear financial plan in addition to engineering plans with the permit application. This is essentially the same authority that needs to be added to legitimize viability assessment of existing gray-zone systems. The necessary amendment of existing statutes can likely be accomplished as a single change covering both new and existing systems.

The fundamental criterion is again completeness. The state's major review function is to audit the cost estimates and physical system requirements. If a developer has not adequately accounted for all costs of the system, it is clear that the equivalence of revenues and expenses asserted in the accompanying financial plan is flawed and the viability of the proposed system is questionable. With this type of criteria, it will be possible for the state to work with the developer until a complete plan is provided. Significantly, the state is never put in a position of saying that a developer cannot develop property. The state's position is simply that a complete plan is required as a basis for approval.

The development of multiyear financial plans will help developers to recognize the full costs of new system development and to consider line extensions and other alternatives if available. The multiyear financial plans will be public information available to banks and potential home buyers.

An additional issue that should reviewed is the constant development of new small water systems to serve new growth. Numerous barriers to extensions of service from existing adjacent water systems exist. Provisions in the federal tax code make it difficult for investor- owned systems to absorb developer-built systems. State public utility commission regulations discourage transactions between different ownership categories and encourages the formation of homeowner associations as a means of evading management and financial oversight by the state. Highly localized issues of land use and water resources management also present numerous barriers to sensible extensions of existing systems.

How to Restructure Nonviable Systems

The difficult aspect of viability policy is addressing nonviable systems. Ultimately, the problems of nonviable systems may be brought to a head because of aging infrastructure and increasing SDWA enforcement actions. Noncompliance is not a problem of drinking water enforcement policy; it encompasses broader issues of public infrastructure, economic development, rural development, and poverty.

Many nonviable water systems were unintentionally designed to fail. Population settlement patterns and development constraints encouraged the formation of tens of thousands of small water systems. More than 50,000 systems serve fewer than 500 persons and account for most of the SDWA violations. Many are not so much small water systems as they are small clusters of homes. In addition, thousands of nonviable systems are in rural areas that have suffered demographic and economic changes. In communities where the mining company has closed and the railroad no longer stops, the conditions are not the same as when the water system was built 100 years ago. Thousands more of the nonviable systems are located in suburban areas, established by developers during the suburbanization boom of the last four decades. Often the weak management by homeowner associations has resulted in inadequate maintenance and modernization, leaving deteriorating systems. As a final example, the failure of a system of any size to recover the full cost of service threatens its long-term viability because routine maintenance and replacement needs are often ignored.

Because states are the level of government with primary oversight of drinking water operations, viability can best be addressed by state governors, legislators, and other policy makers. Action

by states to provide the authority and funding for viability programs will render unnecessary any federal mandate for such programs.

The restructuring solutions that will be required to assist the nonviable systems include a wide array of choices, encompassing: contract operation and maintenance, merger or consolidation, satellite management, purchased water interconnection, formation of water districts or authorities, privatization, and public acquisition. The mechanisms needed to implement these solutions are not fully in place in many states and will need to be established. The existing web of state and local authorities and regulations presents barriers to implementation of some remedies. Some legal and programmatic restructuring of state and local government must be undertaken to allow new institutional approaches.

A number of states have enacted legislation to prevent the proliferation of nonviable systems and reduce or eliminate problems caused by existing nonviable systems. Each legislative package was developed to respond to a particular state's relationship with the water purveyor, customer, regulator, and legislative environment.

For the most part, states that have enacted nonviable system legislation have addressed the concerns about land use, water rights, property rights, and other issues. In the state of Washington, the task took 20 years of continuous work with the legislature. In Connecticut, it was achieved in one swoop in the wake of a severe drought that focused attention on water supply reliability. Much of Maryland's package of relatively effective state and local controls over water and wastewater infrastructure is attributed to legislative initiatives put forward by Abel Wolman in the 1940s. Although these programs have similar elements, a single legislative model is not practical because it could not suit the political and structural variations of each state.

The underlying problems with nonviable systems go beyond drinking water issues to infrastructure policy, economic development policy, and social policy regarding impoverished and rural areas. State policy should steer systems towards long-term viable solutions by helping people become aware of their options and simultaneously maximizing the range of options available. This policy, coupled with vigorous technical assistance, can restructure nonviable systems and place them on a more secure footing for ensuring sustainable infrastructure in the future.

APPENDIX D - AWWA POLICY ON DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES

Adopted by the Board of Directors June 8, 1975, revised Jan. 31, 1982, and revised Jan. 28, 1990, June 11, 2000

The American Water Works Association (AWWA) supports and promotes sound water resources planning and management which provides for an adequate supply of high-quality water for people. These efforts should give careful consideration to regional water resource conditions, environmental impacts, and projec costs.

This must include the wise use of available resource, conservation of water by all practicable means, the reduction of pollution using best management practices, effective treatment and distribution of water, the encouragement of effective water reclamation and reuse when economically and technologically feasible, consideration of in-stream flow needs and the taking of appropriate steps to protect life, property and land from destructive forces of water.

Because comprehensive planning is a dynamic process, continual appraisal becomes the basis for the evolution of policies. It is equally important that the environmental implications of the plans be thoroughly considered in order that any adverse environmental impact be minimized.

It is with this background that the AWWA sets forth the following principles by which the water supply profession can best meet its responsibilities to the public.

1. Where competition among water users occurs, high priority should be given to meeting human needs. To the maximum extent possible, higher quality water should be assigned to domestic use.

2. Each water source should be developed and managed with careful attention to the hydrologic and ecologic systems of which the particular source is a part. Surface and groundwater sources should be managed conjunctively.

3. The growing value of alternative water sources, such as desalted sea or inland saline water as public and industrial water sources, must be recognized. Such sources should be utilized where freshwater supplies are unavailable or inadequate, or where such converted waters are economically advantageous.

4. The responsible use of reclaimed water in lieu of potable water is encouraged for non-potable uses. AWWA urges continued research to improve treatment technologies, monitoring techniques, and the development of health-based drinking water standards, thereby assuring the safe use of reclaimed water.

5. The degradation of the quality of water supply sources has damaging effects on health, welfare, the economy, and the environment. Public water supplies, as an essential factor in the economy, are entitled to a good-quality source water.

6. Water is a renewable natural resource. It must be managed to best meet many needs. Every effective means to prevent and minimize waste and promote wise use should be employed by all entities, public and private, engaged in water resource activities.

7. Hydrologic, environmental, socioeconomic, and other basic data are crucial to water resources development and management. Federal water resources data acquisition programs should be designed and conducted with attention to the full range of current and future uses by all entities, public and private. National databases on streamflow, groundwater levels, water quality, pollution threats, and land use should be made easily available to all water suppliers for their use in water resources development and management.

8. The role of the federal government in water resource programs and projects should be supportive and cooperative, not preemptive. The federal government should recognize and respect the right of each state or province to control the use of its water and associated land resources, provided that management of the resources is responsible to clearly defined national and international needs. Regulations should not necessarily be uniform but should be tailored to regional circumstances and requirements.

APPENDIX E - AWWA POLICY ON QUALITY OF WATER SUPPLY SOURCES

Adopted by the Board of Directors June 8, 1975, withdrawn Jan. 25, 1987.
Adopted by the Board of Directors June 19, 1988 and revised June 11, 2000.

The American Water Works Association (AWWA) is dedicated to securing drinking water from the highest quality sources available and protecting those sources to the maximum degree possible.

Accordingly, in matters regarding the quality of water supply sources, the policy of AWWA is as follows:

1. The quality of existing and potential sources of drinking water supply, including both groundwater and surface water, shall be actively and aggressively protected and enhanced.

2. Where alternative sources of water are available for public drinking water supply, water should be taken from the highest-quality source.

3. Where public drinking water supply is among competing uses for a single water source, the public water supply use is of the highest priority.

4. Where decisions regarding resource use and resource development include alternatives adversely affecting the quality of drinking water supply sources, preference should be given to the alternatives that protect or enhance the quality of the affected sources.

5. Factors to be considered in making a decision between alternative sources include:

    - quality of the sources;
    - exposure of the sources to contamination;
    - costs of developing the sources;
    - timing need for development compared to the expected need for the water;
    - feasibility of constructing and operating the source development projects; and
    - political, social, and environmental impact of the alternatives.

APPENDIX F - AWWA POLICY ON MANAGING GROUNDWATER

Adopted by the Board of Directors June 23, 1991 and revised June 11, 2000.

The American Water Works Association (AWWA) recognizes that groundwater resources are essential sources of water for a substantial number of water systems worldwide and supports and promotes proper development, management and protection practices.

The rational use of groundwater requires the best joint efforts of water utilities, governments, the water profession, the educational community and other groundwater related organizations. Groundwater resources in many locations have been or are in danger of becoming degraded or depleted by overpumping and improper land use techniques, waste disposal practices, well construction, and abandonment practices.

AWWA supports improving the understanding of technical issues related to groundwater and the development of sound legislation and regulations that protect the quality and ensure the availability of groundwater. AWWA strongly supports groundwater planning, education, and wellhead protection efforts to identify potential threats to groundwater quality and availability and to avoid problems before they occur. Public education and outreach involves an understanding of the nature of the resources and development issues such as proper well siting, well design, groundwater withdrawal operations, and well maintenance and rehabilitation practices.

Where competing interests exist, AWWA supports the principle that the best and highest priority use of groundwater is drinking water. This principle should be applied with reason when evaluating natural systems. AWWA supports the development and application of withdrawal recharge, and resource management techniques that optimize the use of groundwater for drinking water.

APPENDIX G - AWWA WHITE PAPER ON INTEGRATED RESOURCE PLANNING IN THE WATER INDUSTRY

Approved December 11, 1993. Published June 1994 in AWWA Mainstream

Background

Regional, state, and local agencies face increasing frustration as they attempt to plan for future community needs. Economic recession, environmental awareness, multiple federal laws, conflicting jurisdictions, scarce resources, and increasing citizen activism make their work appear impossible. The IRP method, however, offers opportunities to resolve competing views that regional, state, and local agencies and utilities face when they attempt to implement their water quantity, water quality, and wastewater management responsibilities.

The water utility demand-side and supply-side plans need to be a part of the overall community plan, with the utility plans using the same consensus basis as the overall community plan. The total use of water must be included as part of the overall community plan. AWWA has endorsed the concept of total water management as one of its long-term goals. Total water management is defined as "assuring that water resources are managed for the greatest good of people and the environment and that all segments of society have a voice in this process." IRP is a tool that can be used in total water management. (Total water management is further discussed in another white paper.)

IRP is a comprehensive form of planning that encompasses least-cost analyses of resource management options, as well as a participatory decision-making process and the development of water resource alternatives that take into consideration communities and environments that may be affected, the numerous institutions concerned with water resources, and the potential for competing policy goals. IRP attempts to consider all direct and indirect costs and benefits of demand management, supply management, and supply augmentation by using alternative planning scenarios, analyses across disciplines, evaluation of social and environmental impacts, and community involvement in the planning, decision making, and implementation processes.

IRP includes planning methods to identify the most efficient means of achieving the goals while considering project costs and effects on other community objectives and environmental management goals. These planning methods specifically require evaluation of all benefits and costs, including avoided costs and life-cycle costs.

The IRP process identifies opportunities to achieve social and environmental benefits through joint utility programs. Examples include energy and water partnerships that conserve both energy and water, water conservation and wastewater treatment and reuse programs that reduce costs of expansion for water supply development and wastewater treatment plant capacity, and the reallocation of existing water supply resources among competing users.

IRP is being advanced on a number of fronts. AWWA is developing techniques and programs to assist water utilities and government agencies in developing or enhancing local IRP programs. AWWA contracted with the National Regulatory Research Institute in 1992 to examine how IRP might apply to water utilities. Special workshops on IRP were held throughout 1993, and a basic

handbook on IRP guidelines will be available in July 1994. The AWWA Research Foundation began a project on IRP guidelines in 1993. A task force was named to develop AWWA's position on new legislation for the reauthorization of the Clean Water Act. In addition, AWWA has created a Total Water Management Task Force to address the full spectrum of integrated water management issues.

At the federal level, the use of IRP by water and wastewater utilities is proposed as part of the reauthorization of the Clean Water Act. A coalition of environmental organizations is proposing that utilities prepare IRPs as a condition for obtaining financial assistance from state-revolving funds. The new requirement would apply to "new and enlarged facilities." The coalition is also proposing that IRP requirements be applied to CWA Section 402 and 404 permitting for larger utilities. The use of IRP by water and wastewater utilities also has been recommended by a consortium of water policy experts convened to recommend critical water issues and opportunities for action by the Clinton administration.

Based on the evaluation conducted thus far, the AWWA task force is offering the following recommendations.

Recommendations

Integrated resource planning (IRP) should be defined as follows:

Integrated resource planning is a comprehensive approach to evaluating supply-side and demand-side resource alternatives with respect to explicitly defined and often conflicting objectives. Encompassing least-cost planning, IRP is broader in its emphasis on an open and participatory decision-making process; the use of planning scenarios that incorporate uncertainties, externalities (costs or benefits associated with providing service that are typically not reflected in a utility's cost of service analysis or rates), and long-term community needs; and consideration of the multiple institutions concerned with water resources and the competing policy goals among them.

Rationale - Some people confuse IRP with least-cost planning. Least-cost planning is defined as the balanced consideration of supply-side management and demand-side management options in identifying effective and feasible least-cost alternatives for meeting future water needs. Although IRP encompasses least-cost planning, it allows the consideration of a broader range of planning criteria--such as reliability, environmental protection, quality of life--in the decision-making process. IRP goes further to emphasize the importance of establishing a more participatory process and integrating the many institutions that govern water resources. IRP encourages the development of new institutional roles and analytical tools. In addition, IRP involves the identification and better quantification of externalities, total community needs, and the allocation of costs to resource beneficiaries. The best options resulting from the IRP process may not be the least costly option in either the short- or long-term.

Water and wastewater utilities should be encouraged to conduct integrated resource planning (IRP). It is especially important that utilities considering the development of new or enlarged facilities undertake IRP.

Rationale - Many water utilities do not coordinate their plans with wastewater utilities and vice versa. Few federal or state regulatory permit programs acknowledge the relationship between long-term water supply planning and environmental management needs. This often has led to resource management problems that must be addressed in a regulatory environment inadequate to resolve the conflicting objectives. These problems include the uncertainty of sources and costs of future public water supplies, depletion of in-stream flows, non-point source pollution, loss of habitat for endangered species, regional groundwater overdrafts, and the elimination of existing water sources for communities. IRP is a tool to develop potential solutions to these problems.

Given the large public and private monetary investment in water and wastewater systems and the economic and environmental influence of these systems, utilities should conduct IRP for those undertakings with significant socioeconomic and environmental impacts. The public has a strong interest in analyzing all reasonable and cost-effective alternatives to increasing water and wastewater treatment capacity, while maintaining a high quality of utility services. For example, if development of additional wastewater capacity can be forestalled by increasing water conservation and without destroying a community's quality of life, that is a benefit, economically and environmentally.

Water and wastewater utilities should be encouraged to include all levels of government in their integrated resource planning efforts, rather than limiting these efforts to the affected water and wastewater utilities. Additionally, any governmental agency preparing IRPs should include the affected water and wastewater utilities.

Rationale - Water policy and planning in the United States is highly fragmented. Multiple levels of government are typically charged with involvement in water management (local, state, and federal governments, public authorities, regional and interstate bodies). Policy and planning considerations at each level often vary considerably. Local governments and water and wastewater utilities are major participants in setting water policy but usually confine their focus to the specific and immediate demands of a narrow constituency. Utilities are generally not allowed to address broad, regional issues that transcend their jurisdictions. These issues have been the domain of state and regional governments.

In order to reconcile "bottom up" and "top down" considerations, it is necessary to integrate specific utility plans with their customers' values, local and regional plans, state and river basin plans, and federal plans. Also, cost efficiency and good planning require input from all levels at the initial scoping phase and throughout the planning period. In short, water planning should not be conducted in a vacuum, and resource planning should not be conducted without effective input from utilities.

Any regulatory requirements for water and wastewater utilities to conduct IRP must also provide utilities with the ability to make and implement decisions at the end of the IRP process.

Rationale - The IRP process will include multiple parties having a wide range of backgrounds, responsibilities, and perspectives. A water or wastewater utility bears the ultimate responsibility of providing safe, adequate, and reliable service to its customers under a wide range of conditions. In contrast, the IRP process may include special-interest parties with no burden of responsibility for the outcome and even those committed to blocking the process or a specific outcome.

The IRP process will be one of information sharing, discussion, and development of "win - win" solutions, but it will not always result in unanimous agreements. The IRP process must include an entity with the authority to supervise the process to reach a conclusion and implement actions, where necessary. The conclusion of the IRP process must allow utilities to provide effective service to their customers and maintain financial viability. In fact, the IRP process should include financial incentives for utilities to encourage their aggressive and innovative participation in the IRP process and the development of "win - win" solutions.

Any federal regulatory requirements for preparation of IRPs by utilities should be limited to a condition of federal financial assistance for new or enlarged facilities and should not be tied to the existing permit process.

Rationale - Because of the wide range of permit activities (CWA Sec. 404 permits in particular), it is not appropriate to link IRP preparation to all permit applications. It would create an unnecessary administrative burden and be detrimental to the existing relationships between permitting agencies, planning entities, and utilities. A much stronger case can be made for federal regulatory requirements where federal funds (grants, loans, or loan guarantees) are involved. If IRP results in a product that is consistent with community priorities for economic and environmental management, regulatory enforcement will not be required to achieve results.

States should be responsible for reviewing the adequacy of IRPs developed by water and wastewater utilities. Any applicable federal legislation should provide for delegation of any IRP review responsibilities to the states. Furthermore, the federal government should provide guidance, technical assistance, and incentives to utilities for this purpose through appropriate recognition in federal permit processes.

Rationale - The states should have the primary role in water resources management, including allocation of water supplies, administration of water rights and permit systems, implementation of water quality protection programs, and protection of public water resource values. The states are responsible for developing water laws and regulations that are responsive to multiple values and interests. In the interests of best water management, the federal government needs to recognize and support the pivotal role of the states in water management. As a result, the federal government should delegate specific water-related programs to the states, including any requirements for reviewing IRPs stemming from federal legislation.

The federal government should continue its role in technical assistance by providing guidebooks or manuals on how to prepare IRPs for use by the utilities and the consulting engineering

community. The federal government should provide a clearinghouse on IRP to aid in the dissemination of technical information.

AWWA should provide technical and policy leadership for promoting IRP among water utilities. AWWA should take an active role in developing criteria required for IRP and in providing technical assistance to its membership.

Rationale - With more than 55,000 members, the AWWA is in a strong position to provide leadership, guidance, and technical assistance on IRP to the water utility industry. AWWA should be an active participant in the development of criteria for use in the IRP process. Should legislation be proposed to require IRP, AWWA should actively participate in the development of IRP criteria for the water industry. Secondly, AWWA should educate its membership and provide technical assistance to utilities needing advice in the IRP process.

APPENDIX H - AWWA POLICY ON DRINKING WATER QUALITY

Adopted by the Board of Directors Jan. 24, 1988 and revised Jan. 23, 2000

All water utilities should deliver to the consumer an adequate supply of drinking water that meets or exceeds all drinking water standards established by regulatory agencies. The objective is achieved most economically and effectively when the source water is taken from the highest quality source water available; the water is appropriately treated to meet regulatory and community water criteria; and water quality is maintained during transmission to the consumer.

The most important goal of public water suppliers is that of providing an adequate supply of high-quality drinking water to the public. AWWA does not establish drinking water criteria, but works in close cooperation with appropriate government authorities to develop drinking water standards to protect the public health and meet the community's aesthetic criteria. These drinking water quality standards should be based on documented health effects research, consumer acceptance, demonstrated treatment techniques, and effective utility management. Concurrently, the water supply profession develops new and improved operation and treatment technologies to enhance water quality and to protect public health.

Public water suppliers should develop and implement operating programs that include water quality guidelines based on the regulatory standards that define safe water and the community's water quality goals. These water quality operating guidelines must be comprehensive and balanced. They should:

- be responsive to regulatory requirements and suitable for implementation;
- include input from the consumers;
- provide for selection, protection and management of the highest-quality source of supply;
- address the potential for changes in source water quality;
- consider proper operation of treatment facilities;
- provide for minimizing changes in water quality during transmission and distribution to consumers; and
- encourage participation in research and use of improved treatment capabilities to better the final product.

Water quality research is essential and is conducted by various groups with the assistance of many different funding agencies. AWWA supports continuous water quality research funding by all agencies and organizations involved with drinking water. Research programs should be coordinated to derive maximum benefits from limited resources and diverse views on research needs. Joint research activities and joint funding of research activities should be encouraged in order to optimize the benefits to the water supply profession and the water consumers.

APPENDIX I - AWWA WHITE PAPER ON CHLORINE FOR DRINKING WATER DISINFECTION

Approved April 14, 1994. Published May 1995 in AWWA Mainstream

Chlorination is an important disinfection option for drinking water treatment for the foreseeable future. Because of chlorine's effectiveness in killing germs, disinfection with chlorine provides critical protection for drinking water consumers.

Recent waterborne disease outbreaks serve as a reminder of the constant threat of infectious disease. Although chlorine is not the only disinfecting agent available to the water supply industry, it is the most widely used disinfectant in North America because of its effectiveness, the scientific understanding of its properties, and the technical capabilities of most treatment plants in North America.

Why We Disinfect

Disinfection of drinking water is a traditional element in public health protection. It is one of three barriers used in standard practice by water suppliers against the microbiological contamination of drinking water. The other two barriers are source protection and water filtration.

The goal of disinfection is to kill or render harmless microbiological organisms that cause disease. In addition to chlorination, other disinfection processes include ozonation and ultraviolet radiation.

Chlorine is a widely accepted and used disinfectant for drinking water because:

- Chlorine is effective against broad spectrum of pathogens. Any disinfecting agent used must be effective against many microbiological organisms that cause disease, including bacteria, viruses, and protozoa. Chlorine has shown itself to be an effective agent against waterborne bacteria and viruses and provides some degree of protection against the protozoan agents.
- Chlorine provides residual protection. Another requirement for a disinfectant is its ability to continue to prevent or inhibit microbial growth after the treated water enters the distribution system. Chlorine residual can protect against some post-treatment contamination that may result from improper cross-connections or main breaks and provides a way to monitor microbial water quality after the water leaves the treatment plant. Only chlorine chemistry (chlorine and/or chloramines), in today's state of the art, provides a lasting measurable residual disinfectant.
- Chlorine has well understood operational requirements. Most water systems serve fewer than 3,300 individuals. Many of these systems and even some larger suppliers rely on part-time operators without advanced training. Chlorine disinfection technology is far simpler than other disinfection technology. Experience shows that reliable operation using chlorine disinfection can be achieved in treatment plants of all sizes. Many states require utilities to have back-up or emergency chlorination equipment when other technologies are used for disinfection.

History of Disinfection Practice

Disinfection of water has been practiced in North America since the early years of the 20th century, when chlorination was introduced. The practice dramatically reduced the incidence of infectious disease, and today most drinking water treatment plants in the United States and Canada use chlorine for disinfection. Any changes in disinfection practice requirements would have an enormous effect on water treatment plant operations and the ability of water suppliers to serve and protect their customers.

Chlorine use for disinfection in water and wastewater treatment is minor in terms of volume, even though most public water supplies in North America use chlorine-based disinfectants. Chlorine used for drinking water disinfection accounts for less than 1.5 percent of the total chlorine use in the world.

Since 1974, drinking water professionals have recognized the need to modify traditional chlorine disinfection processes in response to advances in knowledge, particularly about disinfection by-product formation. Some disinfection by-products are known to produce harmful health effects. In 1979, the US Environmental Protection Agency (USEPA) adopted a trihalomethane (THM) regulation, limiting the allowable level of this carcinogenic disinfection by-product in drinking water. Water utilities have changed their operations to minimize THM formation without compromising public health protection. Changes in operation have included reducing the amount of chlorine used, shifting the point of chlorine application, changing the type of chlorine used, and removing the naturally occurring organic matter that reacts with chlorine to produce THMs.

The USEPA proposed a new drinking water regulation for disinfectants and disinfection by-products in 1994. AWWA anticipates that further changes in practice will occur, particularly in response to recently proposed reductions in allowable THM levels and new limits on other by-products. These changes in operation and plant process design will continue as new developments in treatment technology, scientific knowledge, and regulation occur.

Limitations of Other Proposed Technologies

Suggestions have been made that chlorine use in water treatment can be eliminated by increased use of filtration with sedimentation and flocculation, the use of membrane technology, or use of ozone and ultraviolet light as primary disinfectants. Although these techniques may have advantages in some situations, water suppliers will still need to use chlorine in some form to provide the necessary disinfectant residual.

Conclusion

Drinking water treatment operations must often achieve competing objectives--adequate microbial protection, reduced levels of disinfection by-products, and corrosion control--to comply with USEPA regulations. Balancing these competing priorities may diminish the margin of safety against waterborne disease. Chlorination, particularly when used in combination with

adequate source water protection and well-designed, well-operated physical treatment processes, can produce water that consistently meets public health goals.

The reduction or elimination of chlorine as a drinking water disinfectant or a blanket ban on the use of chlorine for any purpose would endanger the ability of many water treatment plants to consistently provide water with high microbial protection. Chlorine use has been reduced through evolution in water treatment practice and can be balanced with providing microbial protection and reducing by-products. AWWA has assisted utilities in this reduction and will continue to promote the development of improved drinking water treatment technologies that further protect public health.

APPENDIX J - AWWA POLICY ON ELECTRIC POWER RELIABILITY FOR PUBLIC WATER SUPPLY AND WASTEWATER UTILITIES

Adopted by the AWWA and WPCF Board of Directors Jan. 29, 1973 and revised by the AWWA Board of Directors June 15, 1980, Jan. 25, 1987 and June 20, 1999

Uninterrupted utility service is an operating goal of public water and wastewater utilities. To achieve this goal, each public water supply and wastewater utility must first must determine the local probabilities of complete or partial electric utility power outages expressed in terms of frequency, duration, and percentage of requirements, and second, assess its own capabilities to provide water and wastewater utility service from storage, alternate supply, or other source, similarly expressed in terms of frequency, duration, and percentage of requirements, when there is an electric power interruption.

Should a comparison of such a determination and assessment indicate that unacceptable water and wastewater utility service interruptions could be expected when there is an electric power interruption, standby electric service facilities or capabilities should be provided. In general, two separate and independent sources of electric power should be provided to the works from either two separate substations or from a single substation and a works-based generator.

In lieu of constructing their own standby facilities, public water and wastewater utilities may properly contract with the electric power utility for alternate electric service from a separate power supply source. If such service requires unusual facilities or effort not supported by regular tariffs, the electric power utility may be justified in charging special rates or be entitled to a contribution in aid of construction for special equipment.

APPENDIX K - AWWA POLICY ON CROSS CONNECTIONS

Adopted by the Board of Directors Jan. 26, 1970, revised June 24, 1979, reaffirmed June 10, 1984, and revised Jan. 28, 1990 and Jan. 21, 2001

The American Water Works Association (AWWA) recognizes water purveyors have the responsibility to supply potable water to their customers. In the exercise of this responsibility, water purveyors or other responsible authorities must implement, administer, and maintain ongoing backflow prevention and cross-connection control programs to protect public water systems from the hazards originating on the premises of their customers and from temporary connections that may impair or alter the water in the public water systems. The return of any water to the public water system after the water has been used for any purpose on the customer's premises or within the customer's piping system is unacceptable and opposed by AWWA.

The water purveyor shall assure that effective backflow prevention measures, commensurate with the degree of hazard, are implemented to ensure continual protection of the water in the public water distribution system. Customers, together with other authorities, are responsible for preventing contamination of the private plumbing system under their control and the associated protection of the public water system.

If appropriate backflow-prevention measures have not been taken, the water purveyor shall take or cause to be taken necessary measures to ensure that the public water distribution system is protected from any actual or potential backflow hazard. Such action would include the testing, installation, and continual assurance of proper operation and installation of backflow-prevention assemblies, devices, and methods commensurate with the degree of hazard at the service connection or at the point of cross connection or both. If these actions are not taken, water service shall ultimately be eliminated.

To reduce the risk private plumbing systems pose to the public water distribution system, the water purveyor's backflow prevention program should include public education regarding the hazards backflow presents to the safety of drinking water and should include coordination with the cross connection efforts of local authorities, particularly health and plumbing officials. In areas lacking a health or plumbing enforcement agency, the water purveyor should additionally promote the health and safety of private plumbing systems to protect its customers from the hazards of backflow.

APPENDIX L - AWWA POLICY ON WATER CONSERVATION

Adopted by the Board of Directors Jan. 27, 1991, revised Jan. 31, 1993 and June 15, 1997

The American Water Works Association (AWWA) strongly encourages water utilities to adopt policies and procedures that result in the efficient use of water, in their operations and by the public, through a balanced approach combining demand management and phased source development.

To this end, AWWA supports the following water conservation principles and practices:

1. efficient utilization of sources of supply;

2. appropriate facility rehabilitation or replacement;

3. leak detection and repair;

4. accurate monitoring of consumption and billing based on metered usage;

5. full cost pricing;

6. establishment of water-use-efficiency standards for new plumbing fixtures and appliances and the encouragement of conversion of existing high-water-use plumbing fixtures to more efficient designs;

7. encouragement of the use of efficient irrigation systems and landscape materials;

8. development and use of educational materials on water conservation;

9. public information programs promoting efficient practices and water conservation by all customers;

10. integrated resource planning;

11. water reuse for appropriate uses; and

12. continued research on efficient water use practices.

APPENDIX M - AWWA WHITE PAPER ON WATER CONSERVATION AND WATER UTILITY PROGRAMS

Approved June 28, 1995

Water conservation can be defined as practices, techniques, and technologies that improve the efficiency of water use. Increased efficiency expands the use of the water resource, freeing up water supplies for other uses, such as population growth, new industry, and environmental conservation.

Water conservation is often equated with temporary restrictions on customer water use. Although water restrictions can be a useful emergency tool for drought management or service disruptions, water conservation programs emphasize lasting day-to-day improvements in water use efficiency.

The Role of Water Conservation

Community water supply management requires balancing the development of adequate water supplies with the needs of the utility's customers. Traditionally, water utilities have focused primarily on developing additional supplies to satisfy increasing demands associated with population growth and economic development. Increasingly, however, water utilities throughout the United States are recognizing that water conservation programs can reduce current and future water demands to the benefit of the customer, the utility, and the environment.

The increasing efforts in water conservation, often called demand-side management, are spurred by a number of factors: growing competition for limited supplies, increasing costs and difficulties in developing new supplies, optimization of existing facilities, delay or reduction of capital investments in capacity expansion, and growing public support for the conservation of limited natural resources and adequate water supplies to preserve environmental integrity.

The focus of any supply strategy is to satisfy customer water needs in the most cost-effective and efficient manner, minimizing any adverse environmental impact and preserving the quality of life. Although conservation is sometimes an alternative to developing additional supplies, it is more often one of several complementary supply strategies for a utility. A conservation strategy, like any supply strategy, is part of a utility's overall planning and part of the integrated resource planning to ensure that all important community objectives and environmental goals are considered.

Water conservation in the broad sense is a key element in the day-to-day management of the modern water utility. Sound management includes the following basic water conservation practices:

- reduction of unaccounted-for water through universal metering and accounting of water use, routine meter testing and repair, and distribution system leak detection and repair;
- cost-of-service based water rates; and
- public information and education programs to promote water conservation and to assist residential and commercial customers with conservation practices.

Beyond these fundamental conservation practices, effective water conservation programs are tailored to the needs and priorities of each community and recognize local and regional water demand characteristics and water supply availability.

Water Savings and Reliability

Conserved water can be considered a reliable water source. Great strides have been made over the past decade in evaluating and documenting the effectiveness of various conservation programs. Today there is a body of knowledge on water conservation, gained from the experiences of utilities, that provides a relatively high degree of confidence in the reliability and predictability of various water conservation measures. Some water planners feel, however, that the predictability and permanence of conservation measures have not been proven to the same degree as traditional supply measures.

The reliability of conserved water depends on accurate estimates of potential savings, expected benefits, and costs. Careful analysis and planning is a prerequisite to major utility investments in conservation programs. Reliability concerns also underscore the ongoing need for utilities to monitor and document the effectiveness of their conservation programs, just as they do water supplies and facilities.

Long-term conservation programs can affect short-term demand management practices. Reductions in water demands from long-term conservation programs and reductions from short-term demand management measures can overlap. Customers who have installed retrofit devices under long-term conservation programs may have less ability or willingness to further conserve.

In the event of water shortages, agencies with broad-based water conservation programs are able to mitigate short-term and long-term effects better than those without a conservation program.

Financial Aspects of Conservation

Conservation programs typically involve up-front costs, including revenue losses. The full benefits of conservation are realized only after all savings have materialized. However, reduced water sales because of conservation often develop slowly in small increments that can be accommodated in periodic rate adjustments. Over the long-term, conservation can decrease a utility's need for new capital facilities for supply acquisition, treatment, storage, pumping, and distribution. It may also reduce the costs of operating those facilities. Deferring investment in such facilities or reducing their size can provide significant cost savings. In areas experiencing population growth, conservation can provide additional capacity to accommodate growth, resulting in a larger customer base over which to spread future capital costs. Water rates may be lower with conservation than without.

Water conservation can affect wastewater collection and treatment systems. Reduced hydraulic loadings can improve treatment performance in terms of effluent quality and reduced operating costs. Reducing wastewater flows through conservation can result in cost savings by deferring the need to enlarge wastewater treatment facilities.

Rates - The first goal of any rate structure is to generate sufficient revenues to maintain efficient and reliable utility operations, and the second is fairness in the allocation of utility service costs. Generally, it is possible to satisfy both of these goals in a rate structure that encourages water conservation or penalizes excessive water use.

Conservation-oriented water rate structures by themselves do not constitute an effective water conservation program. Rate structures work best as a conservation tool when coupled with a sustained customer education program. Customer education is important to establish and maintain the link between customer behaviors and their water bill. Utility customers require practical information about water-conserving practices and technologies. Participation in other water conservation programs, such as plumbing-fixture retrofit and replacement programs, can also be enhanced by rate incentives and customer education. Finally, public acceptance of rate structure changes is often enhanced if customers understand the need for and benefits of water conservation.

APPENDIX N1 - AWWA POLICY ON DIVERSITY AND NONDISCRIMINATION

Adopted by the Board of Directors on Jan. 21, 2001

The American Water Works Association (AWWA) is committed to proactively promoting volunteer and employment opportunities that will encourage diversity of staff, membership, and leadership in all of AWWA operating units and strongly recommends adoption of policies reflective of that commitment by all water profession organizations.

In addition, AWWA promotes volunteer and employment opportunities with commitment to nondiscrimination to encourage the involvement and advancement of all qualified individuals in all of AWWA operating units and strongly recommends adoption of policies reflective of that commitment by all water profession organizations.

Policies should make it clear that discrimination of any sort is not acceptable and should not be tolerated.

APPENDIX N2 - AWWA POLICY ON AFFIRMATIVE ACTION

Adopted by the Board of Directors Jan. 29, 1990

The American Water Works Association (AWWA) strongly recommends that governing boards and water managers establish policies to offer employment opportunity with commitment to affirmative action to encourage the advancement of minorities and women. Policies should make it clear that sexual and racial discrimination are not acceptable and will not be tolerated.

These policies should prevail in every aspect of employment including recruitment, selection, placement, training, compensation, promotion, transfer, and termination and to all employees and prospective employees regardless of race, national origin, gender, age, or religious preference.

Opportunity shall be afforded to handicapped individuals and disabled veterans who are qualified for jobs that are within their capabilities to perform safely. Reasonable accommodations should be made for handicapped individuals if such accommodation is consistent with the efficient operation of business.

Every effort should be made to ensure that employees work in an atmosphere free of abuse.

APPENDIX O - AWWA POLICY ON EMPLOYEE COMPENSATION

Adopted by the Board of Directors Jan. 26, 1969, reaffirmed June 24, 1979, and revised June 10, 1984, Jan. 28, 1990, Jan. 30, 1994, and Jan. 21, 2001

The American Water Works Association (AWWA) strongly recommends that governing boards and water utility managers establish fair and equitable compensation policies that reward the critical elements of protecting the public health and that are competitive with other industries, utilities, and professional services in their service area. It is recognized that public water services contribute directly and indirectly to the general health and economic well-being of the communities they serve and that implemented compensation programs and strategies should be designed to attract, reward and retain highly qualified managerial, professional, technical, and operating personnel. Therefore, the Association urges the adoption of compensation policies and programs to attract and retain employees competent to manage and operate water systems in a manner that will assure safe and satisfactory water service to the consuming public.

Compensation consists not only of direct monetary remuneration for services rendered but also such benefits as medical and insurance coverage, holidays, vacations, educational assistance (including continuing education, skills enhancement, and certification), retirement, and leave for sickness, injuries, and military or jury duty. Benefits, as with salaries, should also be in accordance with general practices of other industries, utilities, and professional services in their service areas.

An equitable employee compensation program should include:

- equal compensation for work of equivalent responsibility;
- periodic review of the utility's compensation plan and compensation in related industries in both the public and private sector, with periodic compensatory adjustment to maintain a competitive salary base;
- special attention to current conditions and trends in employee benefits because benefits represent a significant portion of the total payroll;
- a method of rewarding employees for competent service;
- employee retention plans, including succession planning that offers utility employees work opportunities and special assignments that develop the knowledge, skills, and abilities required in more responsible and/or promotional positions designed to maintain continuity and stability in water utility operations.
- regular review of position descriptions to ensure they reflect operational and technological changes that might impact compensable factors.

APPENDIX P - AWWA WHITE PAPER ON CONSUMER PRINCIPLES

Approved December 16, 1996. Published May 1997, AWWA Mainstream

The public's demand for information and business' drive for customer satisfaction have led many industries and organizations to spell out their commitment or ethical standards for interactions with their customers.

Hospitals often distribute a bill of rights to patients to assist them in understanding hospital and medical practices and the patient's right to consultation about treatment. Retail stores frequently outline policies for satisfaction and return of merchandise. Restaurants may post pledges of service and customer satisfaction. These actions are designed to increase the public's access to and understanding of the information and services available to them.

Water utilities have traditionally measured their success by the quality of the water they provide, with limited emphasis on customer satisfaction. But it is important to realize and respect that customers define satisfaction not only by the product, but by the services, and related information they receive. A 1993 survey of consumer attitudes commissioned by AWWA and the AWWA Research Foundation indicates that consumers want more information about their drinking water, and nearly nine of 10 respondents supported greater public input to water utility decisions.

In 1993, AWWA adopted three guiding principles:

- Safe and sufficient water for all people;
- Total water management; and
- Customer confidence and satisfaction.

These principles establish the basis for water utilities to develop consumer guidelines. Such guidelines can provide a means for the consumer and the utility to find common ground and help build public trust. For utilities, proactively providing a list of service standards is good business practice, making customers aware of their options and ensuring that the messages the public receives about drinking water utilities accurately reflect utilities' views and abilities. Customers benefit from such guidelines by gaining a better understanding of the services available to them and the value of those services.

AWWA recommends the following model for utilities to use in developing their own guidelines of consumer principles:

- Consumers should have access to safe, reliable, and affordable drinking water.

- Consumers in the United States should have -- in accordance with the 1996 Safe Drinking Water Act provision -- access to an annual, accurate and complete "consumer confidence" report, in plain language, about the source and quality of their public water supply.

- Consumers should have reasonable opportunities to provide input on utility decisions affecting their drinking water.

- Consumers should have a right to personal privacy, protecting against unauthorized use of records (subject to open records laws) ensuring appropriate notice for intrusive maintenance.

- Consumers should have access to a complaints process established by the utility that resolves customer concerns and complaints accurately, promptly and courteously, with minimal inconvenience to the customer.

APPENDIX Q - AWWA WHITE PAPER ON DIVERSIFIED WATER SERVICE

Executive Summary

Water consumers should be provided with safe, ample, and affordable water, and water suppliers should structure their services to meet these consumer objectives. Water supplies from both public and private water utilities in North America are safer today than at any time in history. Simultaneously, increased public acceptance of "diversified water service," defined as any potable water service outside the direct treatment-plant-to-consumer-tap delivery system--such as bottled water, home water treatment devices--suggests that the public often desires to enhance the aesthetic qualities and is sometimes unsure about the safety of their tap water. AWWA and its member utilities can allay public concerns about water quality and support customers in making informed choices about drinking water through increased and effective communications with the public about water quality, utility operations, sensitive populations, and the use of tap-water alternatives. An effective vehicle for communicating such information is the annual Consumer Confidence Report required by the US Environmental Protection Agency (EPA) and state regulators.

Consumer Choices

The majority of water consumers continue to rely on their local utilities to produce a safe and ample product for all water needs. However, increased sales of bottled water and home water treatment devices over the past several years indicate the personal preference of consumers may be shifting away from tap water. Customers are influenced by many factors and ultimately decide what is safe or desirable for the water they consume. Many reasons are given for bottled water consumption or water treatment beyond that provided by local water utilities, including taste or appearance enhancement, convenient packaging, substitution for other beverages, and a sense of higher quality and safety.

Consumers have a right to make choices, and utilities have an opportunity to respond to customer preferences by considering developing additional water products. Consumer preferences in drinking water should not threaten water utilities. However, water utilities need to adequately address consumers' concerns, and water preference trends may indicate a need for additional consumer information, especially about health implications. In addition, water utilities must know what their customers want beyond the basic provision of potable water that meets current scientific and regulatory standards.

Consumer Information

Consumers are best served by understandable, timely, accurate information with convenient mechanisms for feedback. To help consumers with their decision, water utilities need liaisons with local regulatory agencies, health agencies, medical community, consumer groups, and the media to ensure that consumers receive adequate information about their water supply; are informed of taste, odor, and health problems as they occur; and are given a chance, through public participation, to be involved in the decision-making process for issues that significantly affect the community. Utilities are encouraged to listen and respond meaningfully to public concerns, with significant regard to the concerns of special groups and/or sensitive populations.

Water utilities should inform their customers when emergency situations occur, such as a natural disaster or waterborne disease outbreak, when a boil-water order has been issued, or when the utility recommends that its customers use bottled water or appropriate home water treatment devices until the utilities' operations are restored to appropriate standards.

It is in a utility's best interest to educate consumers about its products to enable customers to make informed choices and keep abreast of a utility's on-going efforts to provide safe water. Customers need to understand the differences in water quality. AWWA works with health professionals to educate certain populations--such as the elderly, immunosuppressed individuals, seriously ill persons, malnourished children, and infants-that the use of boiled water; processed, distilled, or reverse osmosis water; or an appropriate home water treatment device may be preferable to conventionally treated tap water (1995 MMWR Report, pg. 12). Water utilities should involve appropriate local health agencies and other groups in making and publicizing these recommendations.

AWWA will work with the USEPA, the Water Quality Association, the National Sanitation Foundation, manufacturers, state, provincial, and territorial drinking water regulators and other organizations and governmental agencies in developing a consistent source of accurate and up-to-date information about water quality; portable packaged water treatment plants, such as microfiltration; bottled water; and home treatment devices. This information should be available through a variety of media formats including a telephone hotline, brochures, media releases, and the Internet.

AWWA should continue to conduct customer surveys, distribute those survey results, and encourage member utilities to more effectively address consumer perception of water quality through enhanced consumer dialogue.

Recommendations

Water utilities should consider treating their water supplies to achieve aesthetic levels for such parameters as taste and odor, color, and chloride below that found in the regulatory requirements of the United States, Canada, and Mexico. For example, chloride levels up to 160 mg/L are acceptable, but above that level, consumers often object to the taste in the water. Although water can be safe to drink, odor and color in the water can affect customer's perception of quality. AWWA supports water utility efforts to provide water that meets all USEPA standards and is also aesthetically pleasing to consumers.

Water utilities should communicate with local purveyors of home water treatment equipment and with bottled water companies to ensure that all parties have consistent and accurate information for the public.

When emergency situations, such as a natural disaster or waterborne disease outbreak, occur, a water utility should issue a boil-water alert to their consumers and work with public health professionals to recommend appropriate alternatives until utility operations are restored to acceptable standards.

APPENDIX R - AWWA ACCREDITATION VISION

Accreditation Defined

Accreditation of water and wastewater utilities is an independent assessment of service quality and management efficiency based upon recognized standards of best available practices.

Accreditation Vision Statement

"Accredited water and wastewater utilities will be recognized worldwide as well operated and efficiently managed."

Accreditation Mission

The accreditation program will serve water and wastewater utilities and their customers, owners, and government regulators, by promoting improvements in the quality of services and efficient management through establishment of standards and formal recognition of accrediting bodies and work to advance a degree of self-regulation through accreditation. To realize this mission, the program:

Establishes the value of accreditation on behalf of all water and wastewater utilities.

- Seeks government recognition in the form of regulatory support, financing availability, and other substantial incentives;
- Promotes the value of accreditation on behalf of the water and wastewater industry to governments, regulators, civic leaders, stakeholders, and customers;
- Educates utilities, customers, civic leaders, and all stakeholders regarding the meaning and benefits of accreditation;
- Coordinates research, analysis, debate, meetings, and other activities and processes that improve accreditation;
- Accepts the support and participation of all appropriate water and wastewater organizations to add credibility to the program and to ensure that all views are considered;
- Develops accreditation program elements that can facilitate worldwide application.

Develops standards for water and wastewater utility operation and management (and the policies for applying the standards) that are used as a basis for conferring accreditation.

- Coordinates the standards approval process, in conformance with the recognized ANSI procedures, to ensure the input of all stakeholders in water and wastewater as appropriate;
- Establishes the guidelines for development of consistent standards in water and wastewater utility operation and management;
- Establishes policies, procedures, and protocols that are used to accredit water and wastewater utilities;
- Develops criteria used to recognize accrediting bodies that may provide services under the program;
- Mediates disputes between utilities and accrediting bodies;
- Coordinates the development and use of tools that help utilities prepare and maintain accreditation.

The Accreditation Program is uniquely designed by utility leaders and technical practitioners to address the needs of water and wastewater utilities. It will serve water and wastewater utilities and their customers, owners, and government regulators, by promoting service quality and management efficiency. Accreditation will establish uniform performance standards and promote industry self-regulation. Recognized independent companies will audit utilities in accordance with standards developed by AWWA. Conducting the accreditation audit process through independent partners will add credibility and authentication to a program designed to incorporate self-regulation. AWWA utility accreditation provides financial benefits and diffuses the need for increased federal regulation for accredited utilities. The program also meets the U.S. Government's desire for privatization of regulations as a means to protect the public and improve service.

Standards

AWWA's formal standards process has been used for more than ninety years to produce ANSI registered material standards that are used by the water utility industry. These standards are recognized worldwide and have been adopted by many utilities and organizations. Accreditation standards will be developed using the same formal process. Volunteer standards committees will establish standard practices in a uniform and appropriate format. Formal ballot procedures will be used to adopt recognized standards. Standards will be drafted during the program development period.

Accreditation pilots will be performed on each standard to refine and clarify the processes. Accreditation will be offered on each standard category as it becomes available. Full utility accreditation will not be available until 2004.

Utilities will apply to AWWA for accreditation. Ten standards relating to water and wastewater utility operation will be offered by AWWA:

1. *Distribution System Operation and Management*
2. *Water Treatment Plant Operation and Management*
3. *Source Water Management and Protection*
4. *Business and Planning Practices Management*
5. *Communications and Customer Relations Management*
6. *Wastewater Collection Systems Management*
7. *Wastewater Treatment Plant Operations and Management*
8. *Biosolids Handling and Management*
9. *Wastewater Pretreatment Management*
10. *Water and Wastewater Conservation and Reclamation Program Management*

Services

A utility may be accredited in one or more standards or they may seek full utility accreditation, by conforming to all appropriate standards for their operation. The modular approach to accreditation addresses the unique operational components at different water systems. Conforming to all individual standards *that apply to its operation* allows a utility to attain full utility accreditation. For example: a drinking water utility with only groundwater sources will be accredited overall by satisfying each of the following standards:

- *Distribution System Operation and Management*
- *Source Water Management and Protection*
- *Communications and Customer Relations*
- *Business and Planning Practices Management*

This approach provides the greatest flexibility for accreditation opportunities to the widest market of water and wastewater utilities.

Preparing for Accreditation

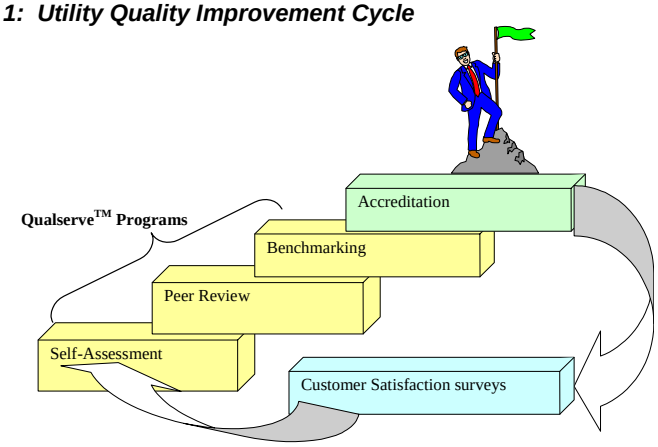
QualServe™

Utilities may take advantage of several tools to prepare for accreditation prior to applying. AWWA's QualServe Programs consist of independent programs designed for both water and wastewater utilities: self-assessment employee surveys, peer review, and benchmarking. The QualServe programs help identify gaps between utility present practices and the standards of practice for accreditation. QualServe programs also assist in the implementation of processes recommended for improvement and measuring the results of change.

Integration with Accreditation

By integrating the QualServe programs with Accreditation, the result is a comprehensive Quality Improvement Cycle (Figure 1). Although each component is mutually exclusive and can be independently implemented by a utility, the primary purpose of integrating these programs is to assist utilities' continuous process improvement. It also permits AWWA to bring utilities and utility performance information together, in order to improve public health and provide enhanced quality of service.

Figure 1: Utility Quality Improvement Cycle



Many utilities provide both water and wastewater services for their customers. These "joint" utilities comprise more than 50% of AWWA utility membership. Joint utility managers will contribute technical expertise necessary in developing standards of practice for the wastewater operations areas.

It may also be advantageous for AWWA to form alliances with other professional wastewater organizations such as the Water Environment Federation (WEF) and the Association of Metropolitan Sewerage Agencies (AMSA) to enhance the credibility of standards in these areas. While QualServe programs are designed for both water and wastewater applications, other

cooperating organizations may develop their own tools to assist wastewater utilities in continuous process improvement.

Partnership for Safe Water

In 1995 six organizations (American Water Works Association, Association of Metropolitan Water Agencies, U.S. Environmental Protection Agency, National Association of Water Companies, Association of State Drinking Water Administrators, and the American Water Works Association Research Foundation) joined in a cooperative effort to optimize water treatment plant performance to lower the risk of *Cryptosporidium* exposure. Utilities participating in the program collect plant performance data that is used to measure improvement. The program provides a structured self-examination process that plant managers use to identify factors that are limiting improved performance. Many of the processes and procedures included in the treatment plant accreditation standard are directly addressed in this assessment. Therefore, plants that have completed the Partnership for Safe Water program should be well positioned to proceed to accreditation for water treatment plant operation and management.

International Water Treatment Alliance

More than 200 utilities in the U.S. have been participating in Partnership for Safe Water program since 1995. The results are proven and documented. The International Water Treatment Alliance program takes the best of the U.S. program and has adjusted it for worldwide application.

The Alliance is a cooperative effort of the American Water Works Association (AWWA), water utilities, and *in some cases* foreign water organizations dedicated to safe drinking water. It is a voluntary program where utilities adopt proven operational and administrative practices designed to improve treatment plant performance. They achieve improved water quality by using flexible technical tools that allow each plant to identify ways to enhance performance that are unique to their own situation.

There are three steps in the Alliance program, namely:

1. Data Collection/Baseline Comparison;
2. Self-Assessment/Peer Review;
3. Accreditation (preparation).

Each step is intended to assist utilities in progressing toward higher goals for finished water quality.

Self-Assessment and Peer Review: Discover ways to improve. Using the structured approach provided in the *Self-Assessment Guide for Surface Water Treatment Plant Optimization*, plant operations are reviewed to identify factors that are limiting plant performance.
This process gives the water utility the ability to take positive steps to improve water quality. The self-assessment procedures are designed to identify non-construction alternatives that potentially could enhance plant performance. A team of utility peers reviews the self-evaluation

report and provides technical feedback to the utility. In recognition of successful completion of the self-assessment portion of the program, the utility receives the prestigious Alliance award.

Emphasis on Microbiological Protection

Are *Cryptosporidium* or *E-coli* a concern?
This treatment plant optimization program was specifically developed to enhance performance to reduce the potential risk of these possible outbreaks.

Six Ways The Utility Benefits

- **A customized performance enhancement plan.**
- **Increased customer confidence.**
- **Increased regulator confidence.**
- **Better methods.**
- **Better information.**
- **Employee satisfaction.**