Recommendations of the National Drinking Water Advisory Council to U.S. EPA on Its National Small Systems Affordability Criteria

July 2003

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Abstract

This document represents the report and recommendations of the National Drinking Water Advisory Council's (NDWAC's) Work Group on the National Small Systems Affordability Criteria. The Affordability Work Group consisted of 18 members, collectively chosen to reflect a balanced range of expertise, experience, and perspectives. Work Group members met five times between September 2002 and January 2003. The Work Group included representatives of small and large water utilities, small system advocacy and technical assistance organizations, academic and consulting experts on small systems and on economics, States and local governments, tribes, and environmental and consumer groups. (See Table 1 on the following page for introductory information about each of the 18 Work Group members.)

The Work Group was asked to provide advice to the NDWAC, which in turn is providing recommendations for the U.S. Environmental Protection Agency (EPA) on the national small systems affordability criteria associated with the variance technology provisions of the Safe Drinking Water Act (SDWA). The Work Group was specifically asked – based on six charge questions posed by EPA – to provide advice on EPA's national-level affordability criteria, the methodology used to derive the criteria, and EPA's approach to applying these criteria to National Primary Drinking Water Regulations. The Work Group also explored strategies – including funding mechanisms and possible legislative actions – that may better enable small systems to achieve compliance in a more cost-effective and/or less financially burdensome manner.

Because the Affordability Work Group was formed under the auspices of the NDWAC, it operated under the NDWAC's ground rules for working groups (Appendix 3), as well as Work Group-specific operating protocols (Appendix 4). The Affordability Work Group used consensus decision-making procedures to guide its deliberations. However, it was recognized at the outset of the deliberations that, due to the complex and controversial nature of the subject matter to be discussed by the Work Group, consensus would probably not be reached on all issues. Where consensus could not be reached, the Work Group was asked to present the range of views expressed, along with a discussion of the potential pros and cons associated with the various alternative approaches. Minority views on issues for which the Work Group did not reach consensus, as well as additional comments submitted by Work Group members, can be found in Appendix 1. These minority views and additional comments are an important part of this report.

TABLE 1
WORK GROUP COMPOSITION

WORK GROUP MEMBER	ORGANIZATIONAL AFFILIATION	CONNECTION TO SMALL SYSTEMS
Kevin Brown	Utah Department of Environmental Quality and Association of State Drinking Water Administrators	Kevin Brown is the Director of the Utah Department of Environmental Quality Division of Drinking Water. He is also a member of the Association of State Drinking Water Administrators (ASDWA). ASDWA represents the drinking water programs in each of the 50 States and 6 territories in their efforts to ensure the provision of safe, potable drinking water. Together, ASDWA's members regulate approximately 166,000 public water systems serving 263 million people. ASDWA's primary mission is the protection of public health through the effective management of State drinking water programs that implement the SDWA.
Stephen Cooke	University of Idaho	Stephen Cooke represented the discipline of agricultural economics on the Work Group. He is associate professor of agricultural economics in the Department of Agricultural Economics and Rural Sociology at the University of Idaho. Dr. Cooke's areas of responsibility are rural economic development and local public finance.
Makia Epie	National League of Cities	Councilman Makia Epie of Cedar Hill, Texas, represented the National League of Cities (NLC) on the Work Group. NLC's mission is to strengthen and promote cities as centers of opportunity, leadership, and governance. It represents 49 State municipal leagues, more than 1,700 cities and town of all sizes directly and, through the membership of the leagues, more than 18,000 municipalities in total. It is the oldest and largest organization representing cities and the only one that includes both mayors and city council members as active participants.
Bruce Florquist	National Drinking Water Advisory Council	Bruce Florquist is a member of the NDWAC, as well as a member of the Water Resources Management Committee for the American Public Works Association and the Public Works Director in Rawlins, Wyoming.

WORK GROUP MEMBER	ORGANIZATIONAL AFFILIATION	CONNECTION TO SMALL SYSTEMS
John Gaston	California-Nevada Section of the American Water Works Association (AWWA) and Association of California Water Agencies	John Gaston is a civil engineer with more than 35 years' experience in the drinking water industry as both a regulator with the State of California and a consultant with CH2M HILL. On this Work Group, he represented both the California-Nevada Section of the American Water Works Association and their 7,500 + members and the Association of California Water Agencies, which represents 80 percent of the 36 million drinking water consumers in California.
Jerry Gilbert	J. Gilbert, Inc.	Jerome B. Gilbert, consulting engineer, has been a manager of large and small utilities and a State regulator. He is also past president of the American Water Works Association (AWWA) and the AWWA Research Foundation (AWWARF). He was a member of the NDWAC Arsenic Cost Work Group, which gave rise to the Affordability Work Group, and is a consultant to utilities.
Merl Hackbart	University of Kentucky	Merl Hackbart is professor of finance and administration at the University of Kentucky, Gatton College of Business and Economics.
Saeid Kasraei	Maryland Department of the Environment and ASDWA	Saeid Kasraei is the manager of the Maryland Department of the Environment Water Supply Program. He is also a member of ASDWA, which is described above under the entry for Kevin Brown.
Laurie Marin	Nez Perce Tribe	Laurie Marin is the Utilities Planner for the Nez Perce Tribe. The Nez Perce Tribe operates community water systems that serve 3 economically depressed tribal communities of under 50 connections each, located over 60 miles apart.
David Monie	Small Companies Committee of the National Association of Water Companies	David Monie, a small system owner, also represents the Small Companies Committee of the National Association of Water Companies (NAWC). The nation's only trade organization for the investor-owned water industry, the NAWC's 200 member systems provide drinking water service to more than 20 million Americans in 42 States every day. The NAWC serves as the ambassador for this $2 billion industry that employs 15,000 people.

WORK GROUP MEMBER	ORGANIZATIONAL AFFILIATION	CONNECTION TO SMALL SYSTEMS
Diana Neidle	Consumer Federation of America	The Consumer Federation of America is a non-profit association of more than 280 pro-consumer groups, with a combined membership of 50 million, that was founded in 1968 to advance the interests of consumers through advocacy and education.
Erik Olson	Natural Resources Defense Council	The Natural Resources Defense Council is a national non-profit public interest organization dedicated to protecting public health and the environment, with over 500,000 members. NRDC strongly believes that all Americans deserve water that is safe to drink and affordable. NRDC recognizes the special challenges faced by small water systems and believes that the best approach to dealing with small system affordability issues is to encourage cooperative strategies, innovative small system package treatment and source protection, and targeted public funding, rather than giving small system water users "second tier" lower quality tap water.
Bob Raucher	Stratus Consulting	Bob Raucher, executive vice president of Stratus Consulting and an active member of AWWA, is an economist with more than 25 years' experience on compliance cost and affordability issues associated with the SDWA. He has worked extensively on the equity and efficiency implications of drinking water regulations, financial strategies, and public health policies.
Velma Smith	Campaign for Safe and Affordable Water	The Campaign for Safe and Affordable Drinking Water is a nationwide alliance of over 300 environmental, consumer, public health and other organizations working to improve drinking water and protect our nation's drinking water sources. The Campaign recognizes the unique problems of small drinking water systems and supports solutions to these problems that will ensure a good quality of affordable water for all Americans.

WORK GROUP MEMBER	ORGANIZATIONAL AFFILIATION	CONNECTION TO SMALL SYSTEMS
Blanca Surgeon	Rural Community Assistance Program	Blanca Surgeon is a technical assistance provider and trainer with Rural Community Assistance Corporation the Western RCAP. Since its' founding in 1969, RCAP has worked to help people living in small rural communities improve their quality of life through ensuring the availability of safe and clean water. The RCAP network includes field staff in all states and Puerto Rico, six regional offices with multi-state service areas, and a national office located in Washington, D.C. Blanca Surgeon is also a member of the NDWAC.
John Trax	National Rural Water Association	The National Rural Water Association (NRWA) is the country's largest community-based environmental organization representing over 22,000 small and rural communities. NRWA is a non-profit, grassroots organization dedicated to improving and protecting the quality of water for rural and small communities and protecting natural resources.
Olivia Wein	National Consumer Law Center	The National Consumer Law Center (NCLC) is a non-profit organization specializing in low-income consumer issues and works with legal services, government and private attorneys, as well as community groups and organizations around the country, in addition to publishing 16 legal treatises on consumer law. NCLC was founded more than 30 years ago to advocate for economic justice for low-income households and is committed to advocating for safe and affordable drinking water for low-income consumers.
John S. Young, Jr.	American Water and National Drinking Water Advisory Council	John Young is a member of the NDWAC and an employee of American Water, which provides water service to approximately 100 small systems and, in total, 20 million customers in 27 States, 4 Canadian provinces, Puerto Rico, and South America.

Background

EPA's affordability criteria establish national guidelines for determining when new drinking water standards are deemed "affordable" for small water systems throughout the United States. If it is determined (based upon the affordability criteria) that achieving the new standard is "unaffordable" for small systems, then EPA must attempt to identify and designate a variance technology – a technology less expensive than EPA-designated Best Available Technologies (BATs), but which also provides less contaminant removal than BATs and, as such, may not achieve the national Maximum Contaminant Level (MCL). To date, no rulemakings have been found by EPA to be "unaffordable" for small systems.

If EPA determines that a rule is unaffordable for small systems and designates a variance technology, then small water systems are eligible to request a technology variance from the system's State primacy agent. Such a variance, if granted, would enable the community to acquire and operate the variance technology in lieu of the more expensive (and more effective) BATs.

NDWAC Perspective

The NDWAC agrees with and adopts the report of the Affordability Work Group, with additional recommendations and minor modifications to some of the Work Group's recommendations. The NDWAC fully recognizes the importance of affordable and safe drinking water, especially for small systems. The 1996 Amendments to the SDWA established the principle that variances in water treatment technology could be used to address the issue of affordability. The efforts of the Affordability Work Group were predicated on the fact that the SDWA includes variances as regulatory construct. However, significant practical, logistical, and ethical issues mitigate against the use of variances.

For example, the cost of establishing the appropriateness of a variance for a specific small system is significant. The heightened monitoring and regulatory burden that would fall to State and local authorities is unacceptable for many of them. Furthermore, the potential acceptance of lower water quality for disadvantaged communities is ethically troublesome.

The NDWAC believes that alternatives to the variance process identified by the Work Group in this report (such as cooperative strategies, targeted use of funding to disadvantaged water systems, a LIWAP, etc.) are more appropriate means to address the affordability problem. Therefore, if a variance process is deemed necessary to achieve affordability, it should only be pursued after all other alternatives presented in this report are given due consideration. However, because the NDWAC has pragmatic and ethical concerns with variances and the associated connotation of a 2-tier approach to protecting public health, the Council makes the following recommendation.

- The NDWAC advises the Administrator to convey to Congress the NDWAC's logistical and ethical concerns with variances and the NDWAC's position that

variances in the extent of water treatment, as a means to achieve affordable compliance, be reconsidered.

Recommendations in Response to EPA's National Affordability Criteria for Small Systems

EPA's current approach to small system affordability is based on an "expenditure margin" concept. EPA's expenditure margin is calculated as the difference between an assumed "maximum affordable water bill" (which EPA currently sets at 2.5 percent of median household income [MHI] for that size class of small systems) and the "expenditure baseline" intended to reflect the current cost of water for the median small system of that size class (current baseline water bill). If the new rule can be implemented for a marginal cost that is less than the expenditure margin, the new standard is considered to be "affordable" for small systems at the national level. The current EPA approach is intended to reflect the cumulative effect over time of multiple regulations and other events that affect small systems' costs, but data challenges inherent in the expenditure baseline national approach limit its ability to do so.

The Work Group recommends a change in the overall approach EPA uses to assess small system affordability, switching to an incremental approach to determine affordability. Specifically, we recommend a national incremental affordability threshold be set at a specific percent of MHI that EPA would apply to individual rules for purposes of determining national small system affordability. The Work Group also recommends that States make system-level variance decisions based on cumulative regulatory impacts and other important system-specific circumstances, as detailed in the full report.

The six questions considered by the Work Group at EPA's request, along with summary responses, are as follows:

Question 1: Should MHI or another income percentile measure (such as per capita income) be used for the income level?

While Work Group members note the possibility that a better metric for determining water system affordability may be available in the future, they agreed that MHI is the most appropriate income metric to use for this purpose at this time. The metric is unambiguous and available for all regions of the nation. Consequently, it is felt that MHI provides a simple, consistent income metric to use in determining "ability to pay."

Question 2: Should 2.5 percent or another percentage be used as the income percentage for determining the maximum affordable water bill, and what is the basis for an alternative selection?

The Work Group recommends that EPA seriously consider replacing its current approach with an incremental approach. Given that the affordability criteria recommended by the Work Group is based on an incremental approach, the question of whether 2.5 percent of MHI is an appropriate standard for total water affordability becomes somewhat irrelevant (although it is discussed at greater length in the full Work Group report).

For the recommended incremental approach, the Work Group recommends setting the national affordability increment at 1.0 percent of MHI.

The Work Group also reached consensus on key recommendations regarding factors States should consider when they administer the variance technology provisions: (1) the "quantum leap" when small systems that have little or no treatment invest for the first time in significant water treatment, triggering potentially significant one-time costs; (2) cumulative impacts of multiple regulations that may affect a particular system, an extended time horizon in making variance decisions, and ways to encourage systems to invest for their long-term viability; (3) meaningful local public education and local public participation efforts to ensure current and future consumers are fully informed in plain language that variance technology does not result in water quality that meets EPA standards, informed of their options, and informed of the implications of the two-tier phenomenon; and (4) full compliance with legal requirements for issuing variances (including a meaningful review of restructuring opportunities, local public hearings, compliance tracking, etc.). The Work Group also reached consensus that EPA re-evaluate variance technologies and BAT at least every 5 years, to take account of technological developments as treatment technologies become lower in cost for small systems.

Question 3: How should the expenditure baseline be adjusted to account for new rules?

The Work Group recommends an incremental approach that eliminates the need for establishing or updating an expenditure baseline. However, if EPA continues use of the current affordability approach, efforts should be undertaken to deal with the concerns described in section 3 of the report. In this case, the Work Group recommends factoring into the expenditure baseline those costs that systems generally incur nationwide and for which there are reliable data.

Question 4: Should separate affordability criteria be developed for surface and groundwater?

The same criteria should be applied to surface and groundwater systems.

Question 5: Should financial assistance be incorporated in the calculations of the expenditure baseline?

As mentioned above, the Work Group recommends an incremental approach that eliminates the need for establishing or updating an expenditure baseline. However, if EPA retains the present approach to making the national affordability determination, financial assistance should be incorporated in the calculations if the financial support is generally available to all systems (nationwide). The availability of financial assistance should, however, be included in the calculations and analysis conducted by the State that ultimately determines whether a variance should be granted, and what the variance compliance schedule will be, regardless of whether EPA uses the present approach to making the national affordability determination or adopts the Work Group-recommended incremental approach.

Question 6: Should regional affordability criteria be developed, given current data limitations?

If EPA retains its current approach to making the national affordability determination, regional affordability criteria should be developed and implemented if data are available from national sources to make eligibility determinations. Due to recognized small system operational cost and other regional differences, it is recommended that EPA establish differential regional affordability criteria when sufficient supporting data are available. To more accurately reflect actual ability and/or willingness to pay, the MHI for small systems should be further differentiated into "rural" (non-metropolitan) and "urban" categories. The Work Group recognizes that both of these recommendations require more detailed data than may be currently available. Therefore, these recommendations may be more appropriate for future than for current affordability policy.

The Work Group also considered whether to recommend applying the incremental approach on a regional basis. However, most members opposed this idea, deeming it impractical, given the data limitations.

The NDWAC recognizes that the incremental approach recommended by the Affordability Work Group is designed to avoid "rate shock" and mitigate the excessive costs of any single rule. However, the NDWAC believes that the cumulative cost of drinking water regulations is also an important consideration in affordability determinations. The NDWAC is concerned that the incremental approach alone does not sufficiently address the cumulative costs of several rules and other operating cost burdens (e.g. infrastructure replacement) that collectively may be "unaffordable" for some systems. The Work Group gave careful consideration to this important issue (see Pages 20-23, 86-89, and Appendix 5), and recommended that, where EPA identifies a need for variance technologies at the national level based on an incremental approach, States consider cumulative impacts at the system-level in determining whether to approve individual variance requests.

Cumulative impacts should be considered, for example, in determining eligibility for grants, loans, and funding under the DWSRF. In addition, if variances are to be made available, cumulative impacts should be considered in determining system eligibility for a small system variance. In order to assist states in making affordability determinations for individual systems:

- The NDWAC recommends that EPA augment the incremental approach with reasonable cumulative affordability guidelines that could be used by the states to determine the eligibility for small system variances and/or financial support.

Recommendations on Financial Support Strategies to Address Affordability Challenges

The Work Group also generated recommendations to improve small systems' access to financial help in complying with the Safe Drinking Water Act (SDWA). The Work Group developed several suggestions, including:

- Providing rate-making information;

- Providing support to individual households in the form of a Low Income Water Assistance Program;
- Changing the way that existing funding sources are used to better support small systems with affordability problems; and
- Providing new funding sources to help solve this problem.

More specifically, the Work Group made several recommendations regarding financial support strategies. The NDWAC modified some recommendations to propose additional studies or less prescriptive solutions to identified problems.

1. Adopt a Low Income Water Assistance Program (LIWAP) to assist low-income households facing high drinking water costs, funded by a Congressional appropriation similar in structure to (though requiring far less money than) the funding for LIHEAP.

2. Provide additional funding beyond the current Drinking Water State Revolving Fund (DWSRF) funding for small systems to adopt cooperative strategies, as broadly defined in Section 4.2.1.

3. Increase DWSRF funding, with special consideration given to assisting small systems.

4. The Work Group proposed that EPA modify the DWSRF allotment formula. The NDWAC believes such an action is premature and instead recommends that EPA determine if, as a result of the current DWSRF allocation formula, small public water systems are being disproportionately denied funding from State DWSRF programs due to inadequate funding being available.

5. Explore and consider the use of other State and federal agencies, such as the U.S. Army Corps of Engineers and the Bureau of Reclamation, to assist small drinking water-related projects.

6. The Work Group proposed that any disadvantaged system should receive priority for DWSRF funding. With the understanding that not all States currently have disadvantaged programs, the NDWAC changed the recommendation to propose that EPA encourage States, that have not already done so, to establish a disadvantaged community program to address small system affordability issues. Such funding should be consistent with the principles in the DWSRF to encourage restructuring where viable. Provide information and examples pertaining to the use of affordability rates for systems to help make water affordable to low-income households.

7. EPA should work with other agencies to help overcome barriers to the effective use of existing funding sources to promote small system affordability for safe drinking water.

Recommendations for System-Level Strategies to Address Affordability Challenges

The Work Group also developed recommendations on initiatives that could be undertaken by the small drinking water systems themselves to minimize the cost of SDWA compliance. Recommendations regarding system-level strategies for addressing affordability challenges are:

1. New and expanded State leadership is essential to promote cooperation among small systems. Cooperative efforts designed for an area or region are essential if the cost of compliance is to be reduced. These efforts should be funded through new appropriations or through re-allocation of a portion of DWSRF funds that are currently being applied to individual system projects. State-managed cooperative efforts should include numerous components, as detailed in section 5 of the full report.

2. Consider regulatory changes to allow the use of system-delivered bottled water in appropriate cases, either as a variance technology or to achieve compliance (with primacy agency approval) for non-microbial, non-inhalation, and non-dermal compliance situations. The use of bottled water should only be considered when it meets applicable standards, is accompanied by a public education program, and the system guarantees quality assurance.

3. Recent scientific and technical developments have increased the potential for "umbrella" compliance technologies, such as membranes. EPA should establish a Work Group to review the technical and policy feasibility of allowing a "Super" BAT approach to provide affordable, long-term compliance, including the consideration of appropriate incentives regarding future compliance.

4. When examining the cost of regulatory compliance at the national or State level, system flow capacity optimization (achieved through control of water leakage, metering, rate structure, and facility design) should be considered prior to calculating the cost of treatment technologies and/or cooperative solutions.

Recommendations on Public Education

Public education is an essential component of any SDWA variance process. For consumers to make an informed decision on the desired quality of their drinking water, they must first understand the public health risk and other water quality benefits, cost of compliance, and compliance options. Effective public education, which is structured to allow stakeholders to participate in developing and understanding solutions for regulatory compliance, must be initiated at the earliest possible date.

The Work Group recommends that EPA take several steps (as detailed in section 6 of the full report) with respect to educating the public about issues related to the affordability of drinking water and small system variances. The Work Group recommends that EPA undertake these steps with outreach to, and input from, stakeholders.

Minority Views and Additional Comments – Summary

A minority report was submitted by the National Rural Water Association (NRWA), and additional comments were submitted by the National League of Cities (NLC). Both submissions are briefly summarized here, and the full reports are provided in Appendix 1.

NRWA: Through its representative on the Work Group, the NRWA filed a minority report indicating disagreement and / or concerns that the recommended affordability level is not affordable for millions of low-income families and many communities. The NRWA also expressed concerns about the lack of availability of a small systems variance technology program "as mandated by the SDWA that allows small and low-income communities to comply with rules without experiencing harmful tradeoffs." Concerns and or disagreements are also expressed regarding consolidation, USDA Program Initiatives, erosion of State and local authorities, control and protection, low-income water assistance programs (LIWAP) and other federal initiatives. (NRWA's complete minority report views are in Appendix 1.)

NLC: The NLC representative submitted additional comments (Appendix 1) indicating concerns about the Work Group's recommendation to enact a Low Income Water Assistance Program (LIWAP) and the Work Group's recommended changes to the Drinking Water State Revolving Fund (DWSRF). While indicating probable support for a LIWAP-like program, the NLC representative expressed concern about the revenue source for funding such a program, particularly if it were done through a "water tax," rather than a Congressional appropriation as recommended by the Work Group. Concerns regarding recommended changes in the DWSRF focused on the fact that allocation formulas are political decisions in which NLC does not get involved, and the view that such changes may ultimately adversely affect some municipalities.

Majority Response to NRWA Minority Report

The majority appreciated the contributions of the members contributing minority reports and is disappointed that a complete consensus could not be reached. While each member of the Work Group brought unique expertise and personal experiences, we believe that the majority report considered and gave significant weight to insights provided by Work Group members from small drinking water systems and those with small drinking water utility experience. Again, the majority respects the opinions of the members submitting minority reports and the input of those members had substantial influence on the substance of the final report.

While the majority recognizes the complexity of the issues at hand, we respectfully disagree with most of the arguments made in the minority report. We believe that the recommendations made by the Work Group establish a balanced approach that will allow the use of small system variance technology programs as mandated by the SDWA. The majority believes that the package of recommendations developed, which seeks to remedy the root causes of the small system affordability problem, will be more successful than an approach relying primarily upon the issuance of variances.

The report makes it clear that cooperative strategies including regionalization and consolidation will help substantially but are not expected to resolve all small system problems. We also make several specific recommendations to encourage stronger State and local authority and control, including, for example, more funding targeted to small system problems and enhanced local participation in variance decisions.

In addition, a low-income water assistance program (LIWAP) would help low-income water users pay for their water, thereby avoiding the difficult financial tradeoffs noted in the minority report.

Acknowledgements

The NDWAC Affordability Work Group greatly appreciates the assistance of the following consultants to EPA and/or the Work Group. Without the data and analysis provided by these individuals, the Work Group would have been considerably less well-informed and would not have been able to produce these recommendations.

- The Cadmus Group, Inc. – Peter Jardine, Ralph Jones, Ken Mayo, Michelle Young
- Industrial Economics, Inc. – Stephen Cantin, Mark Ewen, Jason Sardell, Jonathan Shefftz
- Institute of Public Utilities at Michigan State University – Janice Beecher
- James McFarland, Independent Consultant
- Scott Rubin, Independent Consultant
- Modern Technologies Corp. – Todd Steiner

The Work Group also wishes to thank Vanessa Leiby and Bridget O'Grady of the Association of State Drinking Water Administrators (ASDWA) for their assistance in polling the ASDWA membership on issues of interest to the Work Group.

Recommendations of the National Drinking Water Advisory Council To U.S. EPA on Its National Small Systems Affordability Criteria

1.0 Introduction

1.1 NDWAC Affordability Work Group Charge

This document represents the report and recommendations of the National Drinking Water Advisory Council's (NDWAC's) Work Group on the National Small Systems Affordability Criteria.[1] The Work Group was asked to provide advice to the NDWAC to assist it in developing recommendations for the U.S. Environmental Protection Agency (EPA) on the national small systems affordability criteria required under the Safe Drinking Water Act (SDWA) and on related matters.

The Work Group was specifically asked to provide advice to the NDWAC on:

- EPA's national-level affordability criteria, the methodology used to derive the criteria and the approach to applying these criteria to national primary drinking water regulations;
- Alternative approaches to those used to-date by the Agency; and
- The role of alternate strategies – including funding mechanisms and possible legislative actions – that would enable small systems to achieve compliance.

In developing these recommendations, Work Group members were asked to bear in mind the structure of the SDWA and the limitations of readily available data and information sources.

EPA asked its Science Advisory Board to provide recommendations on a similar list of policy questions. A comparison of the two groups' recommendations can be found at the end of section 6.1.

[1] The NDWAC was established by law to provide practical and independent advice, consultation, and recommendations to EPA on SDWA-related activities, functions, and policies. Recognizing the many new activities mandated as a result of the 1996 SDWA Amendments, the NDWAC formed several Work Groups to provide expert advice on specific program areas. Each Work Group operates under NDWAC's official charter under the Federal Advisory Committee Act and reports directly to the full NDWAC, providing information that can be used to formulate recommendations and advice to the EPA Administrator. (Additional information on the NDWAC and its Work Groups is available on the EPA homepage at http://www.epa.gov/safewater/ndwac/council.html.)

The first meeting of the Affordability Work Group took place September 11 and 12, 2002 in downtown Washington, D.C., and the Work Group met on a monthly basis through January, 2003. RESOLVE, Inc., was retained by EPA to provide neutral facilitation services and to assist in coordinating meaningful and productive Work Group dialogue.

1.2 NDWAC Affordability Work Group Membership

The Affordability Work Group consisted of 18 members (see Appendix 2). Members were chosen to reflect a balanced range of perspectives, expertise, and experience. Collectively, these individuals brought into the discussions the perspectives of State, local, and tribal government, environmental and consumer groups, drinking water utilities, small system advocates, technical assistance providers, and academia.

1.3 NDWAC Affordability Work Group Deliberative Process

Because the Affordability Work Group was formed under the auspices of the NDWAC, it operated under the NDWAC's ground rules for working groups (Appendix 3), as well as Work Group-specific operating protocols (Appendix 4). The Affordability Work Group used consensus decision-making procedures to guide its deliberations. However, it was recognized at the outset of the deliberations that, due to the complex and controversial nature of the subject matter to be discussed by the Work Group, consensus would probably not be reached on all issues. Where consensus could not be reached, the Work Group was asked to present the range of views expressed, along with a discussion of the potential pros and cons associated with the various alternative approaches. Minority views on issues where the Work Group did not reach consensus, as well as additional comments submitted by Work Group members, can be found in Appendix 1.

Members were encouraged to keep their respective constituencies well informed about the Work Group's discussions and to bring their constituents' views into the Work Group discussions in order to ensure that Work Group members:

- Fully understood the challenges they have been asked to address; and
- Could therefore develop advice that was as responsive as possible to stakeholders' needs.

The Work Group's recommendations represent an effort to improve affordability within the broader context of water management in each individual community.

1.4 Work Group Committees

At the outset, the Work Group divided itself into three committees to provide greater focus and take advantage of specific member expertise. The committees focused on: affordability criteria, financial support strategies, and system-level strategies for reducing small water systems' SDWA compliance costs. These committees had discussions at meetings of the

Work Group, and in regular conference calls which were staffed and documented. The results of each committee's activities were reviewed by the full group, and some members participated in more than one committee.

The Affordability Criteria Committee (ACC) focused on six specific questions posed by the EPA:

- Is median household income (MHI) the right metric for determining small water system affordability?
- Should 2.5 percent or other alternatives be used as the income percentage (of MHI), and what is the basis for selection?
- How should the expenditure baseline be adjusted to account for new rules?
- Should separate criteria be developed based on primary source?
- Should financial assistance be incorporated?
- Should regional criteria be developed, given data limitations?

The NDWAC Affordability Work Group's charge also included defining alternate strategies that would enable small systems to affordably achieve regulatory compliance. The role of the Work Group's Committee on System Level Strategies (CSLS) was to investigate non-financial approaches that reduce the cost of small system compliance. Through expanding compliance options beyond individual contaminant removal by conventional treatment, more cost-effective solutions can be identified and implemented, and the need for affordability variances reduced. The CSLS focused on cooperation, treatment technology, alternatives to central treatment, and system flow capacity optimization as methods of promoting affordable compliance.

Recognizing that assistance to small systems to meet compliance requirements at rates that are affordable to these systems should lessen the need for variance technologies, the Work Group tasked the Committee on Financial Support Strategies (CFSS) with exploring means to make financial assistance more readily available to small water systems facing infrastructure improvements to meet regulatory requirements. The CFSS also considered methods to target assistance to individual households in need that are served by small systems charging high water rates in order to meet regulatory requirements. Better utilization of such funds, augmented by additional funding if necessary, has the potential to make quality drinking water affordable to all households and reduce the need for the use of variance technology. The work of the CFSS also links to the national affordability criteria in that, under certain circumstances, financial assistance may be reflected in the way EPA calculates affordability at the national level.

1.5 Issues Considered in Making Water Affordable

The Work Group's primary assignment was to develop recommendations to make EPA's affordability criteria do a better job of achieving Congressional intent. However, the Work Group's charge was framed broadly; it included considering a variety of factors that affect affordability and the ability of small systems to achieve compliance with the SDWA.

Small water systems must comply with current Maximum Contaminant Levels (MCLs) while considering other potential requirements under SDWA such as radon and secondary standards. Compliance is but one requirement for the delivery of water service. Although many small communities rely on individual waste disposal systems, central sewage treatment costs are frequently a part of the total water bill. Both sewer and water systems are in need of capital investment and reinvestment to ensure long-term sustainability. The Work Group considered the affordability issue in this broader context.

The Work Group's deliberations highlighted a number of important interrelated issues. They include the value of cooperation in achieving system needs by consolidation or through common services to reduce costs and facilitate compliance, the difference between system affordability and individual user affordability, the need to ensure water system sustainability, the importance of water conservation and efficient use in cost minimization, and issues related to willingness to pay in addition to ability to pay. Each of these issues is discussed further in the body of this report and related recommendations offered. One other consideration to which the Work Group gave careful thought is the State role in implementing the national affordability criteria. This issue is discussed further in section 1.6.

1.6 The State Role in Implementing the National Affordability Criteria

States play important roles in affordability issues associated with compliance and implementation of the federal SDWA. Currently, 49 of the 50 States implement the SDWA as agents of EPA as part of the "primacy" process. Because of the extensive State role in SDWA implementation and potential impacts of other recommendations in this document on State responsibilities, a discussion of the State's role in implementing the national affordability criteria is important in understanding the remainder of this report.

Other entities at the State, local, and private levels also play important roles in the cost of water service and implementation of the SDWA. Those entities include, but are not limited to, planning and zoning boards, building code inspectors, fire marshals, water rights agencies, rural water agencies, and watershed planning councils.

State-related implementation issues that may affect the basic cost of delivering safe water include monitoring (source and distribution system), surface water treatment requirements, consumer confidence reports, addressing MCL issues, operator certification, source water protection, and other SDWA requirements. Also, separate State requirements (such as construction, source requirement standards, fire flow requirements, etc.) may affect costs to water systems. Below is a discussion of State issues in five critical aspects of affordability: (1)

affecting the cost of water production, (2) developing and implementing variance and exemption provisions, (3) providing or facilitating grants and/or low-interest loans, (4) public education, and (5) resource issues.

States that are particularly pro-active in creating solutions to overcoming the affordability issues described below are referenced in section 4.2.1 of this document.

1.6.1 Affecting the Cost of Water Production

State primacy agents and public service commissions may directly affect the system-level and indirectly the household-level cost of water provision. Factors that may help reduce costs and thereby facilitate affordability and compliance include:

- Effectively promoting water system efficiency and sustainability, such as through encouraging restructuring (physical, managerial or shared resources) of non-viable systems, implementing regional and/or statewide water service delivery programs, providing effective technical assistance, and providing exemptions and variances for systems facing high costs and low ability to pay for needed improvements.

- Conducting regional and/or Statewide planning to help encourage restructuring and to share the positive aspects of restructuring. State water programs, where possible, should take a leadership role in this area.

- Providing or facilitating State revolving loans and subsidies, made to community water systems (CWS) through well-targeted use of Drinking Water State Revolving Funds (DWSRF) monies or other infrastructure funding mechanisms (see item 3 below).

- Working with non-viable water systems in applying the capacity development provisions of the SDWA (refer to sections 1420(a) (b) and (c)). Some States implement the capacity development provisions of the SDWA at a higher level than others. Refer to section 4.2.1 of this document to see a list of States with particularly pro-active programs to encourage restructuring/cooperation.

Likewise, States may increase costs and reduce affordability in several ways, including:

- Establishing standards or other requirements in addition to, or more stringent than, federal MCLs and applying them to small systems;

- Limiting use of DWSRF or other monies for small systems;

- Limiting alternative cost-reducing compliance strategies; and

- Inadequately evaluating technical, managerial, and financial capacity prior to new water system approval.

States can also influence costs according to how they conduct various aspects of their responsibilities with respect to:

- Operation, maintenance, and administrative costs. Water systems are required to monitor source water quality and distribution system quality, provide public notice and consumer confidence reports, maintain operator certification, have repair equipment, prevent cross-connections, have an emergency response plan, maintain records, and report information to States.

- Requiring minimum source quantities (minimum flow rates and number of sources); a minimum number of sources, minimum storage, treatment, disinfection; and distribution systems and other engineering requirements.

1.6.2 Developing and Implementing Variance and Exemption Provisions

A State may also affect affordability by how it chooses to implement variances and exemptions, the variance technology provision of the SDWA, and/or in how it structures consent agreements for compliance.

- General variances (as distinct from small system variances) and exemptions have existed within the structure of the SDWA for many years (refer to sections 1415 and 1416 of the SDWA). These variances and exemptions are for use by all sizes of public water systems. However, because of the resource-intensive nature of these system-by-system determinations and the perception of a "dual" public health standard, States have seldom used the variance and exemption allowances. Also, implementing variances using Best Available Technology (BAT) may make the cost of water to the customer unaffordable.

- If EPA identifies a small system variance technology (refer to section 1420(f) of the SDWA) for a rule in accordance with the provisions of the SDWA, then it becomes the primacy agency's decision as to whether and how to consider and grant variances to small systems in the State. Small system variances are only allowed for public water systems serving less than or equal to 3,300 people, although systems serving less than or equal to 10,000 people could be eligible with the EPA Administrator's approval. Similar to the general variance and exemption provisions, use of the small system variance technology allowance in the SDWA by States is not (as currently constructed) anticipated to be used extensively by States for similar reasons. To date, EPA has not identified any small system variance technology – so no State has been able to offer one. Also, under the current methodology used by EPA to determine small system affordability (2.5 percent of MHI), all regulations may end up with at least one compliance technology that is considered to be affordable by public water systems nationwide. Some members of the Work Group believe that many individual small, poorer systems will be unable to afford some of these improvements.

- The Affordability Work Group's recommendation that States become more involved at the State and local levels in determining affordability at the water system level for variance technologies may cause more drinking water systems to seek variances. As a result, States may have many more opportunities (and resource prioritization problems) associated with implementing the variance technology provisions.

1.6.3 Providing or Facilitating Grants and/or Low-Interest Loans

States have and will continue to assist small systems by either targeting DWSRF monies to them or by helping small systems identify and successfully apply for grants or loans from other parties.

- In designing formulas and applying discretion in how DWSRF monies are targeted and applied across systems, States can help address affordability concerns in small systems. Allowing lower interest rates for water system consolidation and ranking water system restructuring higher on the State priority list are among the opportunities for real cost savings.

- States help small systems obtain grants and/or favorable term loans by actively identifying funding opportunities and assisting communities with their applications. Using external service providers such as circuit riders, educating consulting engineer firms, setting up planning "seed" grant funds, and maximizing the allowable uses of the federal DWSRF set-asides are possible opportunities to assist small water systems in the planning process. In addition, one-on-one training for local water boards is needed to consider the positive aspects of not only physical restructuring, but also managerial and/or resource sharing possibilities.

- Working through health and human services agencies, States may help ease cost burdens on low-income households in systems of any size by instituting income supplements, enabling lifeline rates, facilitating conservation in low-income homes (which typically include older, less water-efficient fixtures), or adopting similar household-targeted mechanisms.

1.6.4 Public Education

- State leadership is a key component in the overall implementation of public education surrounding variances and exemptions, small system variance technology, water system restructuring, and wise use of the State revolving loan funds.

- Public education is critical, particularly for the local government officials who often make key decisions regarding creation of new public water systems and/or evaluate the restructuring of existing public water systems. The education must be ongoing as local government officials turn over (through election and/or attrition) on a regular basis.

- Public education is also critical so that the general public has a full understanding of the cost and public health impacts small system variance technologies may have on their daily lives.

- Nationwide, public education by State drinking water programs has a lower priority than other public health requirements imposed by the SDWA due to State resource constraints. Generally speaking, minimal resources are allocated at the State level to implement a long-term sustainable public education/outreach program. Nationwide, State programs are facing over a $115 million shortfall in funds needed to fully implement current SDWA requirements (This does not include funding for a pro-active public education program, which is not one of the requirements).

1.6.5 Resource Issues

Resource availability and resource prioritization play key roles in implementing affordability issues at the State level. As mentioned above, States, on average, have only 60 percent of the funds needed to fully implement the SDWA. State program and resource managers must carefully balance the workload to ensure public health is being protected. The current SDWA places priority on monitoring water quality, inspections, adequate infrastructure, and technical assistance to public water systems. Full implementation of variances and exemptions, small system variance technology, restructuring, public education, and/or State-level affordability determinations will require additional resources and/or a national reprioritization of SDWA implementation needs.

The report that follows provides background discussion and more detailed versions of the Work Group recommendations that were summarized in the Abstract. Section 2 focuses on consideration of EPA's national affordability criteria for determining when new drinking water standards are deemed "affordable" for small water systems throughout the United States. Related financial support strategies are discussed in section 3. Section 4 deals with system-level strategies for addressing affordability challenges. Issues related to public education are covered in section 5. The Work Group's conclusions and recommendations are summarized in section 6.

2.0 Affordability Criteria

This section provides an analysis of the proposed affordability criteria and the six affordability criteria issues posed by EPA to the NDWAC Work Group. The section begins with an analysis of the concept of affordability, including term definitions and conceptual issues associated with the use of such a term in setting national regulation implementation guidelines. Included is an analysis of the theoretical and operational concerns associated with the use of a term such as "affordability." This assessment is followed by a discussion of the conceptual difficulties associated with setting national affordability standards based on those definitions and reviewing suggested approaches to determining affordability.

Next, the EPA affordability criteria and EPA's six issues and concerns regarding their current national affordability criteria are considered. The responses include an evaluation of the issues posed along with suggestions for alternative ways and means to assess whether the EPA-proposed national standard for affordability determination is reasonable and should be maintained.

2.1 Affordability: The Concept, Definitions, and Concerns

Determination of the affordability of water quality standards (for individuals or households) is both a simple and a complex concept. In simple terms, higher quality water is affordable if a consumer has the "ability to pay" or the financial resources to purchase a product or service. The individual makes consumption choices from among a set of purchases subject to the person's budget constraint or income. Once a person's income is exhausted by apportioning it to various expenditures, assumedly based on rational choices given prices and preferences (or willingness to pay), other purchases become "unaffordable" because that person no longer has the ability to pay for additional goods and services at the margin without reducing expenditures by an equivalent amount in another category.

Likewise for a water system, a new technology is "affordable" if the system has the financial resources or can acquire the resources (for example, cash reserves, loans, or bond sales) to obtain the equipment or technology needed to meet water quality standards. Once the system's resources are employed based upon the system's judgment regarding relative efficiency, effectiveness (and regulatory mandates), other acquisitions are unaffordable unless additional resources are acquired. The major difference between household and system affordability is the possibility that additional system resources may be acquired through rate or price changes if the system's customers are willing to pay the price or have the ability to pay the higher price demanded by the system. Households are constrained by their budgets and water systems by the nature of their costs and production functions. The second affordability question for the system, then, is whether its customer base can afford the rate increase required to support the investment so that the system's cash flow will be sufficient to pay for the new water quality technology.

Thus, in a theoretical sense, "absolute" affordability depends on one's income or financial resources (ability to pay) and preferences regarding the various items available for

purchase. Obviously, specific goods and services are not affordable if their prices exceed an individual's income or a firm's financial resources. Otherwise, the consumer determines affordability based on his or her "willingness" to pay for a product or service as compared to alternative purchases. These consumption trade-offs are made within a household, theoretically, until the ratio of marginal utilities of each good or service equals the inverse of the price ratios. Therefore, under one approach, a product or service may be considered affordable (in a real or ability to pay sense) but "relatively" unaffordable given the consumer's preferences and willingness to pay. A less restrictive definition of a "real" unaffordable good or service would be one that displaces basic necessities in a household's consumption pattern.

From a public policy perspective, however, the concept of "affordability" takes on added complexity. The complexity arises from the fact that currently, national affordability standards have to be established without knowledge of individual preferences. Proxy data and information must be used to estimate household or consumer willingness to trade, at the margin, the consumption of goods and services for an item whose price has increased due to the establishment of new water standards. Likewise, for a water system, new national drinking water quality standards are set without prior knowledge whether the cost of the equipment and technology required to meet the new standard can be passed forward by the system to its customers. If a system's efforts to raise prices are resisted, the system may not be able to "afford" the new technology, and its continued operation may be in question. This is the point at which the marginal costs are greater than the marginal revenues to the water system.

2.1.1 Definitions and Concepts

Due to the practical and conceptual challenges associated with a value-laden term such as affordability, the Work Group attempted to define a set of terms relevant to the affordability issue. The Work Group also considered a series of concepts relevant to assessing the proposed affordability standards. The definitions are:

- **Household Absolute Affordability:** A product, service, or standard is affordable in an absolute sense if households have income levels in excess of the cost of the product, service, or standard after implementation. (Note: for the current analysis, absolute affordability has little relevance as the cost of higher water standards is not expected to exceed household incomes.)

- **System or Firm Absolute Affordability:** Like households, absolute affordability for firms or systems refers to whether the system can raise sufficient capital to install the technology to meet new standards. (Note: like the household case, absolute affordability has little, if any, relevance to the setting of national standards.)

- **Household Relative Affordability:** In contrast to absolute affordability, relative affordability refers to the trade-offs that have to be made by households in order to acquire water that meets national standards. With relative affordability, the focus shifts to the nature of the trade-offs (goods and services given up) required to pay for higher quality water. If the trade-offs are "discretionary expenditures," then the new standards are more affordable for households than if essential expenditures have to be

reduced to "afford" the higher quality water. (It appears that relative affordability is what policy makers had in mind when EPA's proposed affordability criteria were established.)

- **System Relative Affordability:** For systems, relative affordability implies that the system's investment in new water system technology and infrastructure is feasible and the new water rates will not be so high that they induce consumers to opt out of the system. This would reduce revenues at the margin, even as marginal costs increase. If the rates are so high that households cannot afford them (in a real or relative sense), then the system's cash flow will be reduced to the degree that it is unable to cover the system upgrade costs. The Work Group was not provided evidence regarding whether or not this is a widespread or likely problem.

- **System Variance:** If it is determined that compliance technologies which meet EPA MCLs are not affordable (absolutely or relatively) for a small water system, the system may not be required to install a variance technology (presumably at a lower cost). Water bills will still have to increase to cover the new variance technology and operating and maintenance costs. In essence, a small system variance is a "pay less for less" approach.

The concepts relevant to assessing the proposed affordability standards are:

- **Affordability in Context of National Rulemaking:** Affordability for small systems is not a prime consideration when a national standard (e.g., an MCL) is established under the SDWA. MCLs are established based on considerations of public health (the risk-free MCL Goal) and technical feasibility, considering costs (for analytic measurement and treatment). The statute calls for setting the MCL "as close to the MCLG as feasible" generally based upon considerations of feasibility for large systems, while also considering whether a less stringent MCL may be justified based on how the anticipated public health benefits compare to the costs.

  Thus, affordability does enter into the statute's MCL-setting process, but only with regard to what is affordable for the very largest systems. In general, it is unlikely that a rule would not be affordable by a very large system. Therefore the issue of affordability, in effect, becomes moot in the MCL-setting process except to the extent that an unaffordable MCL may have costs exceeding benefits, so it may fail the cost/benefit test. Due to the economies of scale typical in most water supply treatment technologies, standards established under the Act generally impose much higher costs per household in very small systems than in large ones. Technology long-run average cost curves tend to flatten out when the population served reaches approximately 5,000 people, so only the smallest systems tend to have "much higher costs" per household. This fact may make some rules unaffordable for some small systems, and/or unaffordable for some households in systems of any size.

- **Affordability in Context of a Specific Community Water System:** At the system level, the concept of affordability is inevitably linked to the long-term *sustainability*

of the system, and this in turn ultimately depends on the *ability of households to pay* the water charges needed to meet the cost of long-term service provision. Therefore, system-level affordability depends on what revenue collections are needed to operate an efficient and fully compliant utility over the long term, and whether it is reasonably likely that the households and other customers can and will cover those revenue requirements. These marginal revenue requirements are the money needed to meet not only marginal costs but also long-run average costs.

To define or measure affordability at a system level, it is essential that revenue requirements accurately and fully reflect system sustainability costs and revenues (including grants and other subsidies received, regardless of source, to subsidize the costs of infrastructure, security, and other expenses required for system sustainability). It also is important to consider household-level impacts within the system. This can be evaluated according to what percent of households face a cost impact above a given threshold (e.g., the water bill as a percent of annual household income) or, alternatively, what percent of income is spent on water by households of different income characteristics (e.g., the median household income).

To ensure or promote system-level affordability, the policy mechanisms available focus predominantly on the difficulty of households to meet the revenue requirements for a water system as a whole. Some policy options accomplish this by reducing or delaying costs borne by the utility (e.g., variances). Other options do not affect costs per se, but instead cover a portion of the revenue requirements (e.g., grants and favorable-term loans), so that the revenues required from customers can be reduced and meeting the MCL becomes more affordable.

- **Affordability in Context of Households:** Households are both the primary beneficiary of improved drinking water quality and the entities that ultimately bear the costs of meeting new MCLs. Paying for higher water quality inevitably requires that each household make trade-offs, because additional funds spent on water must come at the expense of other spending or saving options at the margin. Affordability at the household level therefore is directly related to the types of "trade-offs households must make" in order to pay for increased water costs.

  For middle and upper income households, water bills tend to require a relatively small portion of the household's disposable income and a lower marginal utility of money so that increases in water bills typically will affect mostly spending on discretionary, non-essential items. In lower income households, however, the trade-offs may be more difficult. While data presented to the Work Group suggest that a "typical" low-income household may spend more on alcohol, tobacco, and entertainment than they do on water, some Work Group members are concerned that additional spending on MCL compliance may entail a household trade-off of another essential good, such as foregoing medical care, food and nutrition, heating, phone service, and the like. These members believe the trade-offs necessary to pay for MCL-driven water bills might end up creating a net increase in the health risk for the impacted households. This belief is based on data presented to the Work Group indicating that many low-

income households' expenditures on necessities alone exceed their income. However, other members believe that it is just as likely that bottled water, soda, alcohol, tobacco, or unhealthful junk food expenditures would most likely be the first items to be traded off to pay for higher quality tap water. If the latter trade-offs occur, higher standards and associated increased water costs could produce indirect health benefits for the community. These expenditure trade-offs suggest a higher utility of money in low-income households.

Affordability at the household level can be an issue in both small and large systems. Because per household costs of installing new treatment or other technologies are typically much higher in small systems than large ones, the percent of households forced to make difficult trade-offs due to the installation of new treatment is likely to be higher in small systems than in large ones. Still, the urban poor and other low-income households in large systems are also likely to face difficult choices when water bills increase.

Policy mechanisms to improve household-level affordability include tools to supplement household-derived revenues with additional water utility funds (e.g., grants, low interest loans, variances and the like) as well as changes in operation and management or restructuring that reduce the overall costs that must be covered. These system-targeted mechanisms can be quite effective in helping households in small systems.

In addition, household-targeted mechanisms such as income supplements and lifeline rates may directly affect affordability. It should be noted that the latter are likely to be more effective in large systems than they are in small ones, since there is a larger customer base to cover the intra-system subsidy. By reducing the price of safe drinking water to low-income households, society increases the marginal utility of safe drinking water to low-income households relative to the marginal utility of other goods and services.

For further discussion of these issues, see the sections of this report dealing with ways to enhance related financial assistance programs and system-level strategies (Sections 3 and 4, respectively).

2.1.2 Affordability Issues

The review of definitions and concepts indicates that there are several conceptual issues involved in setting national affordability standards. Some of the major issues are identified here along with tentative recommendations and interpretations based on the Work Group's understanding of its charge and related discussions:

- Does affordability mean absolute or relative affordability?

  For both households and systems, the emphasis is on relative affordability or the trade-offs that must be made to "afford" the higher water quality associated with the new MCLs.

- If the concern is relative affordability, how can/should relative affordability be estimated or determined?

  Relative affordability could be estimated by using "willingness to pay." "Willingness-to-pay" is an approach focused on trade-offs, at the margin, and covered in the next section. This could be a reasonable approach when accompanied by an evaluation of "defensive expenditures," relative expenditures on other household items, and cost of water in similar nations. Willingness to pay is a conceptual approach to determining consumer and system attitudes regarding trade-offs that may be necessary to "afford" new products or services (or water standards or the infrastructure required to meet new standards). It is consistent with the concept of relative affordability.

- Should affordability standards be focused on system affordability, household affordability, or both?

  While the Work Group held extensive discussions regarding household affordability issues and realizes that system affordability may be linked to household affordability, the EPA charge to the Work Group focuses on system affordability. Other sections of this report (sections 3 and 4, reflecting the work of two other committees (the Committee on Financial Support Strategies and the Committee on System-Level Strategies) offer suggestions that will enhance both household-level and system affordability.

2.2 Approaches to Determining Affordability

Given the complexities of setting affordability standards suggested by the previous sections, what conceptual approaches are available to meet the EPA challenge of setting "national MCL affordability standards"? Four methods for estimating system affordability have been proposed: (1) analyzing relevant defensive expenditures by households and other users, (2) assessing willingness to pay, (3) considering international water rates for "benchmark" comparisons, and (4) comparing drinking water rates to other household expenditures (e.g., utilities, entertainment, alcohol, and tobacco.) The second method (willingness to pay) can be further divided into "revealed preference" and "stated revealed preference." Each of the conceptual approaches to estimating affordability is explored here to provide a basis for assessing the appropriateness of the proposed EPA approach to setting national affordability standards.

2.2.1 Defensive Expenditures

The "defensive expenditure" approach to estimating affordability is based on the assumption that a new regulation is affordable if the cost of the technology required to meet the new standard is approximately equal to the cost of "defensive" measures taken voluntarily to offset the problem or "disamenity" the regulation is intended to eliminate. While initially appealing, this approach requires the acceptance of some basic assumptions, including (1) that the disamenity is understood and defensive expenditures are already being made, and (2) that the purchasers of the defensive measures are the individuals who are the focus of the affordability analysis. If the latter assumptions are reasonable, the use of bottled water and of point-of-use (POU) and point of entry (POE) devices may be reasonable "defensive measure" affordability proxies. However, in the case of rare drinking water contaminants, the disamenity may not be understood and, therefore, defensive expenditures may not exist to a great extent at least across all systems and households. In other words, the current purchasers of the defensive measures for meeting drinking water standards may not represent the broader population's values for improved drinking water standards.

While this method of national affordability analysis has limitations, it also has advantages. Chief among its advantages are the existence of actual data (the cost of bottled water, for example) and general availability of such data nationally. Also, defensive expenditures such as bottled water provide a "cost base" upon which a new national standard focused on demonstrated consumer values could be constructed. As noted, however, such a defensive expenditure may only reflect the values of certain consumer groups and other unrelated values or preferences may be affecting such defensive expenditures.

2.2.2 Willingness to Pay

The second approach to estimating affordability may be theoretically and operationally more appealing than the "defensive expenditure" approach. In its simplest form, analysts would attempt to determine the willingness of consumers to pay for water meeting the new MCLs. Such willingness to pay would then serve as an indicator of affordability given household incomes and/or budget constraints and the household's elasticity of demand for drinking water. It is assumed that the willingness to pay assessments would reflect consumer relative affordability based on the trade-offs that the new higher quality water would mean for their budget.

As noted, there are two approaches for empirically implementing the willingness to pay affordability approach: revealed preference and stated preference. The revealed preference approach to affordability determination involves observing consumer actions that might serve as proxies for the regulation being analyzed. (Such observations could include national expenditure data by income cohort.) In the case of water quality standards, a potential "proxy" observation would be data on the purchase of bottled water. Like defensive expenditures, this affordability determination approach has shortcomings. Among the shortcomings is the limited ability of revealed preference to reflect consumer values and motivations. It is difficult to determine whether price or another factor, such as aesthetics, convenience, or prestige, has influenced

consumer decisions to purchase bottled water. However, if only the cost of bulk bottled water is considered in estimating defensive expenditures, it is unlikely that prestige or convenience would be significant factors.

Contingent valuation or "stated preference" is another approach for estimating willingness to pay or affordability. In this approach, individuals would simply be asked to indicate the price they would be willing to pay for better quality water. While initially appealing, this approach requires significant research and surveying to determine preferences. Again, this approach has limitations including the specific design of the survey, consumer understanding of exactly what improved quality means, including information on the specific contaminants and their potential impacts as well as attitudes and characteristics of the respondent.

2.2.3 International Water Rate Comparisons

The third general method of estimating affordability is to use a comparison group that has made similar choices for "benchmark" comparisons. A potential "benchmark" comparison group for affordability of enhanced drinking water standards could be water rates in nations similar to the United States. While there may be significant data problems associated with such comparisons (exchange rates, comparison periods and the like), the international water rate comparison provides a useful perspective regarding the acceptance of water rates in other economies as another indicator of willingness to pay: Such analyses can determine whether water is more highly valued in the United States or in other countries. If water appears to be relatively inexpensive in the United States compared to other countries, it might suggest that water rates could be raised to accommodate the cost of technology needed to enhance water quality and meet the EPA MCL. Such an approach has limitations, however, as different values and other factors may be involved, and some Work Group members felt these limitations would limit the relevance of such international affordability comparisons.

2.2.4 Comparison to Other Household Expenditures

Another method that can be used to ground truth the other three methods of determining affordability is the comparison of water rates to other common household expenditures. For example, the Work Group was provided Bureau of Labor Statistics data indicating that the average household (whether it is in the lowest quintile of income or at the median of income) spends about 4-5 percent of its total household expenditures on energy, 4-5 percent on entertainment, 3 percent on telephone services, about 1 percent on alcohol, and about 1 percent on tobacco. These necessary and discretionary expenditures could be used as additional proxies for willingness to pay for a necessity such as high-quality water.

The Work Group considered all four of the methods discussed above in developing its recommendations for the percent of MHI that constitutes an affordable expense for drinking water, or for complying with a drinking water standard.

2.3 The EPA Affordability Criteria

The EPA national affordability threshold sets the maximum affordable water bill at 2.5 percent of the MHI for the median system in a given size category. EPA has set standards for three size classes of small systems, and the affordability standards are the same for ground and surface water systems.

The key EPA calculation used for determining whether new system standards are affordable involves comparing the "available expenditure margin" with the anticipated "incremental" water bill impact of water system expenditures (capital and O& M) required to meet the new EPA water quality standards. The "available expenditure margin" is estimated by subtracting the current "median baseline water bill" from the affordability standard or maximum affordable water bill (2.5 percent of the MHI for the median system ranked by MHI). It follows that the incremental water bill impacts of a new rule are not affordable if such incremental costs exceed the "available expenditure margin." A concern of the Work Group regarding this overall approach involves the possibility that the "expenditure margin" could get fully used over time through cumulative regulatory procedures. This could result in a situation whereby small water system compliance and variance analysis is governed by time sequences of rules rather than considering where there are the greatest, most cost-effective opportunities to reduce risks and protect public health. There was also a concern on the part of some members that the expenditure margin would not adequately reflect cumulative regulatory burdens on individual systems (as discussed below).

In setting the 2.5 percent standard, EPA appears to be using a combination of modified revealed preference and defensive expenditures to estimate the water system affordability threshold. The 2.5 percent standard was established by using other household goods and services as proxies for "willingness to pay" for quality water. EPA also analyzed defensive expenditures for guidance in determining "revealed preferences" for quality water. The agency also considered international water rates.

2.4 The Six Charge Questions: Reactions and Recommendations

EPA faces a major challenge in setting national affordability criteria across small water systems. Regardless of the criteria chosen, the criteria must be (1) simple so that all relevant parties can understand and work with them, (2) based on national data sources that are readily available, and (3) structured so that it is clear whether a water system meets the criteria or should be a candidate for the State to consider for a system variance. This section provides the Work Group's reactions and recommendations regarding the six issues that EPA specifically referred to it for consideration. In addition, the Work Group's concerns and recommendations are compared and contrasted to those of the EPA Science Advisory Board, which was asked to consider a similar set of questions.[2]

[2] U.S. Environmental Protection Agency, *Affordability Criteria for Small Drinking Water Systems: An EPA Science Advisory Board Report*, EPA-SAB-EEAC-03-004, December 2002.

2.4.1 EPA Affordability Criteria Concerns

1. Is MHI the right metric for determining small water system affordability?

Observation

MHI meets several basic, reasonable criteria for national system affordability standards. MHI data are available for all regions of the nation. The calculation of MHI is simple (it is based on readily available per capita income and household density data), and the metric is unambiguous and can be understood by various parties. Consequently, it provides a consistent income base for determining a reasonable measure of affordability or "ability to pay" for new water system quality standards. The Work Group observed that the SAB supported the use of MHI as the metric for determining small water system affordability.

Recommendation Regarding the Metric to Use

The Work Group agrees with the SAB and recommends that the MHI be used as the most appropriate income metric for determining water system affordability available at this time. Work Group members note that a better metric may be found in the future.

2. Should 2.5 percent or other alternatives be used as the income percentage (of MHI), and what is the basis for selection?

Observation

If a percentage of MHI is the standard adopted, the selection of the appropriate percentage becomes an important consideration. If the percentage is lowered (from 2.5 to 1.5, for example), the "door" that allows for small system variance considerations may be opened more often or for more classes of systems (i.e., size groupings). For example, the "available expenditure margin" for the "median" system with a 2.5 percent threshold was estimated to be $769 for systems serving 25-500 customers; $747 for systems with customer bases of 501-3,300; and $771 for systems with between 3,301 and 10,000 customers. If the threshold (percentage) was reduced to 1.5 percent, the expenditure margins would drop to $317, $303, and $282, respectively. If a higher threshold is selected, EPA may find that the expenditure margin is not "exceeded" for any of the three size categories and, therefore, no national small system variance technology would be identified. If that is the case, then the states would have to use compliance time extensions, enforcement discretion, general variances or exemptions to deal with hardship cases of small systems unable to afford full compliance. Small system variances might not be available at all.

In fact, the Work Group was informed that no rules have resulted in identification of a small system variance technology for any size class of system using the current standard (2.5 percent). The SAB suggested that because the national affordability threshold has not been exceeded consideration should be given to lowering the percentage (below 2.5 percent). It further indicated, without citing any data, that "some small water systems appear to have genuinely struggled with costs." Therefore, the Work Group asked consultants to use their

database and information sources to try to determine if the SAB concern was justified. The consultant's database was created from the 2000 U.S. Census and the 1995 Community Water Systems Survey. Included in the database are income and population data for 465 systems serving 25-500 people, 380 systems serving 501-3,300 people, and 211 systems serving 3,301-10,000 people. From these observations, water bill information is available for 163, 208, and 112 systems, respectively (by size class). Analyses of these systems can be extrapolated to the total population of small systems, which according to U.S. EPA includes 31,327 systems serving 25-500 people, 14,149 systems serving 501-3,300 people, and 4,458 systems serving 3,301-10,000 people.

The consultants did not find a single system in the database whose water bill now exceeds 2.0 percent of MHI. Only seven systems in the database exceed 1.5 percent of MHI: two in the smallest size class, four systems in the next size class, and one system in the largest size class. These systems represent about 1 percent of all systems in each size class.[3] Even if very few systems now exceed 1.5 percent of MHI, and even if none now exceed 2.0 percent, future rules could increase their costs significantly, especially if the rules are not so costly as to trigger the availability of a variance technology. Federal financial assistance, however, may be available to help systems that do struggle with costs. The consultants estimated that about $37 million in annual assistance subsidies (e.g., grants, loan forgiveness) would be necessary to bring all small systems below 1.5 percent of MHI, before any new rules are considered. For the arsenic rule, the consultant estimates that about $100 million in one-time assistance for treatment equipment would be necessary to keep all small systems below 1.5 percent of MHI (assuming that most small systems affected by arsenic have relatively low treatment costs, but that some other systems have relatively high costs). By contrast, $850 million was allocated from the FY 2002 budget to the Drinking Water State Revolving Fund for all eligible infrastructure projects and set-aside activities. Of this, up to $216.8 million (30 percent) is eligible to be used for subsidies (including principal forgiveness for disadvantaged communities).

While the consultant's calculations suggest that the SAB concern regarding "struggling systems" may be isolated, future regulations may involve compliance costs that could pose financial viability challenges for some small systems. Therefore, some Work Group members felt that there may be some justification for considering a lowering of the current EPA affordability standard (2.5 percent). Other Work Group members believe that there may be some justification for an affordability standard greater than 2.5 percent of MHI because the true value of "safe" water to the public may be greater than EPA's established threshold.

Admittedly, the determination of the percentage of MHI that "nationally" establishes a reasonable, equitable affordability standard does not lend itself to scientific analysis. If a

[3] As a check upon the accuracy of this database, an EPA consultant reviewed a compilation of State water surveys it had performed in 1993, representing 1,203 small systems. Based upon a 90,000 gallon annual consumption, 36 systems were above 1.5 percent of MHI, representing about 3 percent of the sample. Since this 1993 compilation was intentionally biased to target States with high water bills, this higher result (i.e., 3 percent of systems above 1.5 percent of MHI, as opposed to 1 percent) suggests that the CWSS/Census-based database is reasonably accurate for the purposes of producing national estimates.

percentage of MHI is the affordability standard ultimately chosen, the percentage selected is based on a somewhat subjective analysis of various indices of "willingness to pay," "ability to pay," and "informed" value judgments.

After reviewing data and analysis of the proposed EPA standards and household impact comparisons, some members of the Work Group felt that a 2.5 percent of MHI affordability standard may be reasonable; some thought it may be too high, while others thought it may be too low.[4] However, the Work Group felt that it was appropriate to consider other measures of affordability to assist in evaluating the "reasonableness" of the EPA affordability threshold.

Consequently, the Work Group evaluated various "incremental" measures of small water system water quality standard affordability because some members felt that an incremental approach was a more theoretically sound approach to determining the affordability of individual standards. Among the incremental approaches suggested by some members of the Work Group were (1) the use of value of statistical life (VSL) as an indicator of the willingness to pay and, hence, affordability, and (2) the use of a percent of MHI as the maximum dollar expenditure per water quality standard. The suggestion that a VSL approach be used was controversial to Work Group members, and no consensus was reached on its appropriateness. The latter standard (a percent of MHI) would be derived from the analysis of a series of comparisons of enhanced water quality standards (their potential benefits, the willingness to pay by households and other measures) relative to small system income levels.

Among other considerations, the incremental affordability approaches were offered as a means of managing the "adding up" problem associated with EPA's expenditure baseline. The proposed EPA affordability threshold, as currently structured, applies to an aggregate water bill (and willingness to pay to reduce accumulated risks across various contaminants), while an incremental approach may be more conceptually appropriate. Some economists argue that each risk and the affordability of the associated regulation should be evaluated on an incremental basis.

The incremental affordability measures are described in the sections that follow.

- The use of a percent of MHI as an "incremental" approach to determining a national affordability standard:

  The use of a "percent of MHI" as an incremental affordability criterion could be established based on an analysis of willingness to pay measures (comparable expenditures as a percent of MHI), defensive expenditures (bottled water, for example) or other observations regarding household affordability or willingness to pay such as the "doubling of current water bills." For example, if the current EPA standard of 2.5 percent of MHI (and associated calculations), the VSL analytical approach, and the "doubling of current water bill" approach yield similar "incremental" percentages of MHI, that percentage could be used as the national,

[4] By near consensus (17 of 18 members), an incremental affordability threshold of 1.0 percent of MHI was deemed acceptable to the Work Group. (One member believed 1.0 percent was too high.)

incremental affordability threshold for a single contaminant regulation. Such a standard would be simple and would be used as a first screen. Other detailed, system-level data would be used by the states to determine whether a variance should/would be granted.

For the decade of the 1990s, the average water bills for small water systems in Utah were calculated and provided to the Work Group. During that period, the average water bill was calculated to be approximately 1 percent of statewide median adjusted gross income (MAGI). Because Utah is a western State, it seems reasonable that such costs are at the "high end" of comparative water systems. On the other hand, other data indicated that the average water bill for households amounted to about 0.5 to 0.6 percent of MHI. This measure of affordability suggests that a doubling of the median household's current water bill might result in a new water bill that cost in the range of 1 to 1.2 percent of MHI. As such, it could be a reasonable approximation of incremental affordability. This standard would be an incremental national standard and would apply to each new regulation being implemented by EPA.

Such an incremental national standard could be used in combination with the current EPA analytical approach (which includes an assessment of the current expenditure baseline and the expenditure margin). For example, under the incremental approach, 1 percent of MHI could become the national affordability standard or threshold for each rule. If the 1 percent of MHI standard indicated that a system was eligible for a variance, the EPA affordability model could be used by State officials along with other system-specific considerations as a factor in determining whether a small system technology variance should be granted if an EPA-approved technology was available.

- Value of statistical life as a determinant of affordability:

  An alternative incremental approach for estimating considered by the committee was the VSL approach. This approach was controversial among committee members, and no consensus was reached on its appropriateness. VSL data have principally been developed as a means of estimating the monetary impact of reducing risk of premature fatality; they typically are applied to rulemakings associated with potentially fatal cancer risks. Because some contaminants have been identified as contributing to the incidence of cancer, some Work Group members suggest that consideration should be given to the use of VSL data as an alternative means of estimating what households would be willing to pay to reduce the incidence of cancer risk. The VSL data have been critically reviewed and have been used by EPA in part (along with non-quantifiable benefits) as a basis for estimating health risk reduction benefits for premature mortality from some contaminants. At the same time, some economists and Work Group members believe that VSL data have serious limitations and biases, that many contaminants to which EPA regulations apply cause non-fatal adverse effects for which VSL is not relevant, and that control of most contaminants will yield many non-quantifiable benefits that cannot be captured under the VSL approach. These Work Group members also are concerned about what they believe is

the malleability of the VSL approach, including the use of discounting of the presumed value of lives based on age, latency of effects, and other factors.

While the limitations of VSL are recognized, some members of the Work Group feel that consideration ought to be given to estimating willingness to pay and affordability with VSL data as a supplement to determine the reasonableness of the current EPA standard (2.5 percent of MHI) or as an alternative incremental approach to establishing the national affordability standard. Other Work Group members, based upon the concerns noted above and other issues, believe VSL is not an appropriate method to determine affordability.

Recommendations Regarding Analytical Approach and Value of the Metric to Be Used

- The Work Group recommends the use of an incremental approach to setting the national small water system affordability standard. The incremental approach would replace the current EPA standard and calculation methodology. While Work Group members are concerned about the implications of the "adding up" problem of the EPA expenditure baseline calculation (a critical element of the current methodology), the Work Group's analysis suggests that an incremental approach is theoretically sounder, is simpler to administer, and has greater transparency, making it more understandable than the current EPA method.

  The Work Group also observes that an affordability methodology that permits the assessment of each new rule independent of the cumulative costs of preceding regulations (the adding up problem with the current methodology) is an appropriate and equitable national affordability criteria (while cumulative regulatory impacts, which are still vitally important, are best addressed at the State level).

  The Work Group believes that the States would be in a better position to consider the impact of previous regulatory compliance efforts, the mitigating impacts of financial support or local subsidies, and other regional and local factors on the cost structure of small systems. The latter factors should be considered in determining the relevant "expenditure base" for a small system, and such information would be relevant in the determination of whether a variance should be granted (assuming that the incremental standard qualifies a small system for a variance and an alternative technology has been identified by EPA).

  The Work Group also recommends that the incremental affordability criteria be set at a fixed percent of MHI. As indicated in Appendix 5, such a criterion, while sharing the problem of a degree of subjectivity with the current EPA methodology, also appears reasonable when it is compared with the EPA approach or a set of alternative incremental methods considered by the Work Group. For example, given the current MHI of about $40,000, a 1 percent of MHI rule would set the affordable per regulation standard at $400. This is approximately two times the current water bill

for the median household (felt by some members of the Work Group to be a high water mark for perceived household affordability for a rule), and about 1.5 times the cost of POU-treated water.[5]

In summary, the Work Group recommends that EPA use an incremental approach to determining national affordability and that the value of the increment be a fixed percent of MHI per rule. See below for recommended value of the increment.

- The Work Group recommends setting the increment at 1 percent of MHI. (One of the 18 Work Group members opposed this recommendation, advocating for a lower percent.)[6]

- When a State makes a decision about whether to allow a variance, it should consider the "quantum leap" and "rate shock" phenomena. This issue occurs when small systems that have no or little treatment must invest for the first time in significant water treatment. This will trigger potentially significant one-time investments (e.g., manifolding wells, establishing a centralized treatment building and equipment unit) that probably will not have to be repeated if future rules are issued.

- In addition, when making variance decisions, States should consider the cumulative impacts of multiple regulations that may affect a particular system. The Work Group encouraged States to consider an extended time horizon in making variance decisions, encouraging systems to invest for their long-term viability. The Work Group notes that this recommendation might also have broader implications regarding financial assistance to systems (e.g., a State might decide to set eligibility for financial assistance relative to a certain cumulative impact).

- The Work Group also agreed that, when a State is considering whether to allow a variance, a strong effort should be made through a meaningful local public education and local public participation effort, to ensure consumers are informed and understand (1) that the variance technology does not result in water quality that meets EPA standards, (2) the implications of the two-tier phenomenon, and (3) all the options they may have for achieving compliance. These efforts should be ongoing to ensure that new consumers are educated, too. These efforts should be done using simple, straightforward language. Related legal requirements (found in SDWA section 1415(e) and EPA's regulations at 40 C.F.R. section 142.301 et seq.) should be followed, including:

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[5] Interestingly, 1 percent of MHI is only slightly higher than a VSL-based indication of potential willingness to pay (approximately $250 as calculated by a Work Group member), using a method not agreed to by all Work Group members. Some Work Group members believe this reinforced the appropriateness of the 1 percent of MHI number. As noted earlier, however, other Work Group members do not agree that VSL-based data are suitable for regulatory analysis of this nature. They believe that the method used to develop the $250 estimate may substantially understate the public's willingness to pay for health protection. (See Appendix 5.) Some members, during deliberations regarding the VSL approach, suggested that if a VSL standard was used, an "adjustment factor" might be added to the VSL value to overcome the potential understatement of benefits inherent in the VSL calculations.

[6] See Appendix 1 for minority views.

- Conducting a local hearing or hearings;
- Conducting a meaningful review for the system applying for a variance as to whether the system cannot afford to comply through:
  - Treatment;
  - Alternative source of water supply;
  - Restructuring or consolidation; and/or
  - Financial assistance under the Drinking Water State Revolving Fund (DWSRF, administered by EPA and the States), the U.S. Department of Agriculture's Rural Utilities Service (RUS), the Community Development Block Grant (CDBG) Program administered by the U.S. Department of Housing and Urban Development (HUD), or other State or federal programs.
- Ensuring that the system has the financial and technological capability to install, operate, and maintain the equipment;
- Assuring that the variance will ensure adequate protection of human health and meets all legal requirements for a variance;
- Tracking compliance with the variance; and
- Reviewing the adequacy of the variance at least every 5 years.

The Work Group recommends that EPA re-evaluate variance technologies and BAT at least every 5 years, to take account of technological developments as the cost of treatment technologies declines. EPA should share resulting information with State primacy agencies to assist in their 5-year reviews of variances and their assessments of whether to approve variance technologies for specific systems.

Given the affordability criteria recommendation of the Work Group (a substitution of an incremental approach for the EPA methodology), the question of whether 2.5 percent of MHI is an appropriate standard becomes somewhat irrelevant. However, the question of whether 2.5 percent of MHI is a reasonable value for the affordability metric was aggressively discussed and debated, with the Work Group not reaching a consensus on the issue, assuming EPA maintains the current methodology.

Those supporting a lowering of the standard to 2 percent of MHI or less raised concerns, as did the EPA SAB, about the apparent fact that no systems had qualified for variance consideration with the current standard. Work Group members suggesting that 2.5 percent or a higher value be used were concerned that a "widening of the door" or increasing the likelihood of variance considerations for small water systems might lead to a two-tier system of water quality standards. In summary, the Work Group prefers an incremental approach to affordability criteria setting. If EPA decides to continue use of its current methodology, no recommendation is offered regarding the question of whether a 2.5 percent standard is appropriate.

3. How should the expenditure baseline be adjusted to account for new rules?

Observation

The EPA affordability threshold approach is based upon adding the estimated compliance costs for a "new" rule to the baseline water bill that households are already facing. This baseline is known as the "expenditure baseline." There are several challenges and problems with how the expenditure baseline is estimated and how it must be periodically updated to reflect additional regulations and other factors that will affect household water costs. Among the issues are the following.

- The current baseline is estimated on revenues collected by CWSs, as identified in the Community Water Systems Survey (CWSS) data set. For many small systems, revenues collected do not fully reflect the full costs of current operations, as indicated by CWS expenditure data from the CWSS data set. (Expenditures tend to exceed revenues in 60 percent of the systems responding to the 1995 survey.) However, it is not clear that small systems reporting into the CWSS were amortizing/capitalizing their reported expenditures, so it may be that expenditures are overstated for some systems.

- Even if there were reliable, annualized historic expenditure data for small systems, the costs for many systems may need to be adjusted upward to reflect additional utility expenditures associated with achieving sustainable service. This adjustment should be made to the extent that there are reliable national data for making such adjustments to reflect revenue needs for long-term sustainability.

- When the costs of new regulations are added to the baseline, the proposed approach spreads those compliance costs across ALL the systems in a size category. As a result, there would be a considerable diluting of the costs faced in a given system (e.g., if 10 percent of systems face a compliance cost for a given new rule, then the expenditure baseline would reflect an increase of only 10 percent of what the costs would be in an affected system).[7] At the same time, it is not known how many individual small systems will have to spend considerable sums to comply with multiple new standards (e.g., arsenic, radon, the groundwater rule, and/or future microbial/disinfection byproduct rulemakings, and uranium). It is not clear exactly how to resolve this issue if EPA continues to rely upon its current approach, but under the recommended incremental approach, this issue becomes moot at the national level, and states can examine any cumulative regulatory burdens faced by individual small systems.

- Infrastructure rehabilitation and replacement costs — above and beyond capital needs related to regulatory compliance — should be added to the baseline calculations, to

[7] For example, the EPA methodology could increase the expenditure baseline by only $12 per household per year to account for the arsenic standard, whereas households in small systems needing to comply with the MCL are expected to see average costs of $240 per year or more.

the extent that there are reliable national data to document such an adjustment. Recent studies (e.g., EPA, the Congressional Budget Office, and the Water Infrastructure Network) indicate that the "gap" between the needs for capital spending on infrastructure and the available subsidies is significant. Conservative estimates suggest the gap will require a 3 percent increase in baseline water rates per year, compounded every year, for at least the next 20 years to meet recognized needs.

- The added costs of security and anti-terrorism efforts should be added to the baseline as well, to reflect the expected costs for vulnerability assessments, training, emergency response training, and any potential physical changes needed to protect water system facilities. This adjustment should be made to the extent that there are reliable national data to document such costs for small systems.

- Subsidies should be added to the baseline calculations as well, to the extent that they (1) are readily available to assist the small systems in need, (2) are not already counted in the "gap" analysis noted previously, and (3) are available for regulatory compliance rather than other capacity development needs.

- EPA's proposed "expenditure baseline" calculations do not take into account the fact that many small systems do not, presently, have the capacity to run effectively in a sustainable manner. The technical, managerial, and financial (TMF) aspects of small water system capacity building take time and resources to achieve. To the degree that TMF issues are currently dealt with, they may be benefiting from cross-subsidies and voluntary efforts. Work Group members expressed concern that the current baseline calculations do not include such costs and these costs would have to be accounted for as systems take steps to meet new standards and ensure long-term sustainability. As a result, increases in the expenditure baseline may exceed the incremental cost of new regulation compliance.

- On the other hand, potential differences in water usage and rate structures for low-income users are not captured in the baseline calculation. Many low-income users may pay less than the median cost of water for their system size because, for example, they are eligible for lower rates (e.g., lifeline rates or the low end of inclining block or seasonal rates) or because they have lower water usage than the median (e.g., due to frugality in light of income limitations or due to low outdoor water use for lawn watering, etc.).

- It was noted that the SAB had concerns that the use of the currently structured expenditure baseline could lead to a situation that early regulation might be deemed affordable while later regulations may be determined to be unaffordable because the affordability threshold has been crossed.

Recommendation Regarding Expenditure Baseline

As noted, the Work Group recommends that an incremental approach to affordability determination be used with a fixed percent of MHI per rule, rather than the current EPA

affordability methodology. As the recommended incremental methodology does not include the calculation of an expenditure baseline, an expenditure baseline recommendation would be moot if this recommendation is accepted.

However, if EPA decides to maintain its current methodological approach, it is recommended that efforts be undertaken to make expenditure baseline adjustments to alleviate concerns raised about the expenditure baseline as discussed above. In this case, the Work Group recommends factoring into the expenditure baseline those costs that reliable data indicate systems nationwide generally incur.

4. Should separate criteria be developed based on primary source?

Observation

The Work Group observed minimal cost differences between surface and groundwater systems. At the same time, it was observed that treatment costs vary widely for both types of systems.

The Work Group agrees with the observation of the SAB that the critical issue for small water systems is standard affordability not the source of water.

Recommendation Regarding Source-Specific Criteria

The Work Group recommends that the criteria chosen for national affordability screening be the same regardless of water source. Moreover, EPA guidelines for State officials to use in making the final determination of whether a variance should be granted should also be the same for both ground and surface water systems.

5. Should financial assistance be incorporated?

Observation

Water system financial assistance varies from State to State and region to region. While there are national sources of water system financial aid (e.g., DWSRF and RUS), State and local governments have sponsored financial assistance programs in an effort to assist local water systems. So while financial assistance can affect the expenditure baseline of operating systems, differential financial assistance opportunities across the country make it difficult to use such assistance in equitably establishing national threshold standards.

Recommendation Regarding Consideration of Financial Assistance

Like the SAB, the Work Group recommends that if EPA retains the present approach to making the national affordability determination, financial assistance should be included in baseline (or other calculations associated with determining variance eligibility) analysis when such financial assistance is routinely available for systems throughout the nation.

Because the States will be involved in the final determination of whether a variance is warranted, the Work Group suggests that EPA's variance guidelines include a suggestion that States consider local and regional financial assistance in determining whether variances will be granted.

6. Should regional criteria be developed, given data limitations?

Observation

Under current standards and conditions, the costs of operating small water systems vary due to water source, pretreated water quality, and cost of compliance with current standards. Compliance costs will likely vary for new EPA standards as well. Therefore, a universal affordability standard or threshold could lead to variances for high-cost regions even though the "willingness to pay" for the region indicates that higher water prices may be affordable by the affected population.

It seems reasonable to set differential standards if regional "cost of compliance" data indicate major regional cost differences and regional data suggest that "willingness to pay" varies by region. For example, cost data for systems located in the western States (due to arid climate and population dispersion) tend to be higher than comparable cost data for small systems in the eastern States. Likewise, MHI varies according to whether the system is located in a rural or urban community.

Recommendation Regarding Regional Criteria

To more accurately reflect compliance costs, efforts should be undertaken to establish differential regional threshold standards that reflect regional compliance costs. More specifically, in this case, the Work Group recommends that EPA establish differential "regional" affordability criteria, to the extent that reliable data are available.

To more accurately reflect the actual ability and/or willingness to pay, the MHI for small systems should be further differentiated into rural and urban categories.

The Work Group recognizes that both of these recommendations require more detailed data than may be currently available. Therefore, these recommendations may be more appropriate for future than for current affordability policy.

The Work Group also considered whether to recommend applying the incremental approach on a regional basis. However, most members opposed this idea, deeming it impractical given the data limitations.

2.4.2 Other Concerns, Suggestions and Recommendations

1. Adjusting National Standards Over Time

Observation

As indicated above, "willingness to pay" is a consumer judgment based on preferences, knowledge, and other factors. As citizens learn more about the health risks from sub-optimally treated water, their willingness to pay is likely to change. As a result, a higher affordability threshold may be appropriate in the future.

Recommendation

The NDWAC Work Group recommends that the affordability threshold chosen be periodically reviewed to ensure it reflects changing attitudes and values.

2. Managing the Household Affordability Issue

Observation

While the primary charge to the Work Group centered on system affordability, members of the Work Group recognized the important, though indirect, relationship between household affordability and system affordability. If the price of water is increased to such a level that a significant number of low-income households cannot afford to pay their water bills, the cash flow anticipated by a water system may not be realized and the investments and water system expenditures based on those assumptions become unaffordable for the entire system.

What is more, problems of household affordability can emerge in any type of water system, regardless of overall financial capacity. Individual households may face hardships in paying for water, regardless of the overall "reasonableness" of system costs. Due to these complexities and the limited charge to the Work Group, the recommendations have treated household affordability as an important consideration, albeit not the focal issue for this document. The Work Group recognizes that many of the options for dealing with household affordability may be unique to certain States, regions, or systems and, for the most part, this "within" system affordability issue may be addressed most effectively at the State or system level.

3. Verifying the calculations used to determine willingness to pay

Observation

Data used for willingness to pay calculations are based on a set of assumptions that should be verified. For example, EPA estimated an "affordability threshold" of about $550 per household per hear ($550/HH/yr.) based on bottled water consumption of 2 liters per day per person, and 3 persons/HH. Other data suggest median consumption rates of 1L per day and a typical household with 2.6 persons. These data would suggest an expenditure per household of

about 43 percent of the $550 estimate developed by EPA, or just under $240/HH/yr compared to the EPA estimate of $550. Some members pointed out that current expenditures for bulk bottled water are by no means a ceiling on consumers' willingness to pay for safer water and, indeed, may represent a floor for some households. On the other hand, other Work Group members point out that most households choose not to purchase bottled water for routine in-home use, and these members believe that willingness to pay could be less than the prevailing bottled water market price. It is worth noting that the limited studies available have found that when the public is informed of a health risk in its water, the willingness to pay for risk reduction actions such as bottled water typically increases.

Recommendation

Given the significance of the data selected on the affordability criteria, the Work Group recommends that calculations used to estimate willingness to pay based on household water use be re-analyzed and verified as reasonable estimates prior to use as proxies for willingness to pay.

3.0 Financial Support Strategies

3.1 Introduction

One method of addressing drinking water affordability problems is to provide additional financial support to water systems or individual households. Financial support can be funded at the individual system level, the State level, or by the federal government. If financial assistance is made more readily available for small water systems facing infrastructure improvements to meet regulatory requirements, the need for variance technologies may be reduced. In addition, under certain circumstances, financial assistance may be reflected in the way in which EPA calculates affordability at the national level. Recommended financial support strategies include providing information on affordability rate-making practices, supporting individual households with a Low-Income Water Assistance Program (LIWAP), making changes in the way that existing funding sources are used to better support small systems with affordability problems, and providing new funding sources.

3.2 Discussion

3.2.1 Rate Setting Techniques to Enhance Water Affordability

EPA should provide information and examples pertaining to the use of affordability rates for systems to help make water affordable to low-income households*)*

Introduction

The design of water rate tariffs varies significantly, both over time and between water systems.[8] In the early years of the water industry, flat rates (charges based on a per customer charge or based on the number of water fixtures) were widely used. Most systems have now gone to a metered rate basis with at least part of the water bill based on the amount of water used. Traditionally, it has been thought that the best water rate design is based on matching the revenues produced from the various customer classes to the cost of providing service to the same classes ("cost of service rates"). The term "cost of service rates" is also used to describe a rate design system that produces sufficient total revenues to match the full costs of operating a system. All of the tariff design examples in this section assume this full matching of revenues and expenses is happening.

Since water, like most commodities, is generally cheaper to produce and deliver in quantity to one customer, declining block rates (rates that decline as more water is purchased by one customer) historically have been the most widely used rate design which best approximates cost of service rates. In recent years, however, many communities have abandoned strict cost of service rates to address both water conservation and affordability concerns. The most widely used method of addressing conservation concerns is to eliminate the declining block rate concept

[8] Systems and utilities, as well as tariffs and rates, are used interchangeably in this section.

and substitute either uniform rates (same consumption charge for all water quantities) or inclining block rates (the more water one customer uses, the higher the price). To discourage water use for lawn irrigation, seasonal rates (with higher prices for water used in the summer months) have also been used for conservation purposes.

This section will discuss the various tariff design mechanisms available to address affordability concerns. Finally, this section will look at the "rate shock" issue, which occurs when water rates increase significantly over a short time period, such as when new treatment is added to meet new regulatory requirements.

Affordability Rates

To promote conservation and provide a cost break to the small water user, many water systems have abandoned the declining block rate methodology. One common method of rate design is to use both a service charge (sometimes called a customer charge) and a consumption charge. To promote conservation and affordability for very small water users, the service charge can be kept artificially low with correspondingly higher consumption charges. An "artificially low" service charge fails to fully recover all of the utility's fixed costs and allows a low-volume user to pay something less than the full cost of service. The amount lost on these small users is then made up by larger users, who contribute toward variable and fixed costs with a higher consumption charge. This small user subsidy can be increased by using an inclining block rate or seasonal rate methodology. Another method of subsidizing small water users is to use a minimum bill (a fixed price for the first block of water consumed) concept with an artificially low minimum water charge. In this concept, rates and the "minimum consumption block" are set based on the presumed amount of water necessary for a small family to live on which is then used to determine the minimum consumption block. These methods are sometimes referred to as "lifeline rates." Table 2 shows an example of how using such rate designs can produce lower rates for small users. The columns headed "Modified Cost of Service Rates" are an example of what the tariff design might look like using uniform rates that most closely match cost of service rates. Since the best way to match cost of service rates is to use a declining rate block design, these rates are called "modified cost of service rates." In section A of Table 2, the service charge concept is used with both a uniform consumption charge and an inclining block consumption charge. To allow for small users to have the maximum benefit, the service charge is greatly reduced. By putting higher fees on consumption, conservation is promoted. By having no minimum allowance, conservation is promoted for all user sizes. As would be expected, the small user gets a greater subsidy when inclining block rates are used. A disadvantage of subsidizing all small users is that all small users are not in low-income households. In addition, some low-income households are larger, necessitating greater use of water.

The most widely used reference for setting water rates has been *Principles of Water Rates, Fees, and Charges* published by the American Water Works Association (AWWA M1 Manual). This manual, while describing the best method for developing cost of service rates, has been modified to include other tariff design principles. The current 5th edition, published in 2000, includes a discussion of "Low-Income Affordability Rates" (Chapter 16 – see Appendix

6[9]), including various methods to promote affordability. The manual recommends that affordability rates, such as lifeline rates, be limited to low-income households. By limiting the use of lifeline rates to low-income customers, the benefit can be increased and the effect on the remaining customers can be lessened. Table 3 shows the possible effect of limiting the examples in Table 2 to customers who meet low-income eligibility requirements. It is assumed that 15 percent of the customers will meet low-income requirements, and the table shows an assumed distribution of low-income household water use. The examples in Table 3 do not repeat the modified cost of service rates as shown on Table 2, but show the lifeline rate examples. As expected, low-income users at all consumption levels obtain a greater subsidy, while other users, at higher consumption levels, get penalized less.

These examples show that it is possible to have affordable rates for low-income households by adopting lifeline rates. The examples shown in Tables 2 and 3 are based on an average residential bill of approximately $492 per year, with average consumption of 104,000 gallons per year and median consumption of 84,000 gallons per year. These rates are higher than national average rates and were chosen to show that a 5,000 gallon per month user can be subsidized to ensure that water rates are affordable for most low-income households. Data submitted to the NDWAC suggest the assumed $492 annual water bill is two and one-half times the estimated average annual household bill of $197 for a system serving roughly 1,000 customers using EPA's national database. Further, the annual water bill assumed in these tables constitutes roughly 1.3 percent of median household income for systems of this size. It should be recognized, however, that there are some small systems that serve a very high percentage of low-income homes. Lifeline rates alone are not likely to alleviate the affordability problem in those systems.

As a further illustration of how lifeline rates can be used to offset the costs incurred by low-income households, the example rate structures detailed in Tables 2 and 3 have been expressed as a percentage of household income based on a summary of national data reported to the NDWAC. Tables 4 and 5 express the reported monthly charges from Tables 2 and 3 as a percentage of estimated MHI. Monthly water bills for all customers were expressed as a percentage of median income using median values and are compared to similar results for low-income customers using the 10th percentile value for MHI in systems of this size. These tables further indicate that when expressed as a percentage of MHI basis, affordability rates provide an opportunity for low to moderate usage, low-income households to have annual water costs below EPA's affordability threshold.

It is interesting that the size of the system is not as important as the diversity of the customers in determining the efficacy of affordability rates. The examples shown use a system serving 1,000 customers. The results would be the same in any size system with the same distribution of customers. Larger systems, however, tend to have a larger proportion of commercial and industrial customers, which benefit the efficacy of affordability rates.

[9] Reprinted with permission of the American Water Works Association. Copyright 2000.

The advantages of using affordability rates to alleviate the small system affordability problem are:

- In most cases, lifeline rates can be implemented by an individual system and do not rely on outside sources of funding. While regulatory approval may be required, especially for investor-owned water systems, no new legislation must be enacted. Many systems already, to some extent, use this method.

- Affordability rates promote water conservation as well as address affordability.

- Affordability rates can be very effective in systems that have a relatively low proportion of low-income households.

The disadvantages of using affordability rates to address small system affordability issues are:

- Regulatory approval is needed for some (e.g., investor-owned) systems.

- Affordability rates do not follow cost-of-service principals under which revenues are based on the cost of providing service to each customer class. This is especially true in systems that have larger commercial and industrial customers. Some systems have separate rate schedules for such customers.

- Affordability rates require some users, especially larger users, to subsidize other customers. This may be difficult to implement if there are significant objections by the subsidizers.

- Affordability rates are not effective in systems that have a high proportion of low-income households.

- Affordability rates may be beyond the capacity of some small systems to implement. It may be particularly difficult for small system operators to determine qualifying low-income households unless they are able to link enrollment in other programs, such as Low Income Home Energy Assistance Program (LIHEAP) and Supplemental Security Income (SSI), to eligibility for lifeline rates.

Rate Shock

An indirect effect of affordable water rates is “rate shock,” a significant and sudden increase in the cost of water. While the new, higher cost of water may be deemed affordable overall, the sudden increase may be difficult for low-income households to incorporate in their budgets in the time frame required.

Rate shock can occur when a new and expensive treatment technology must be implemented, especially in systems with little or no existing treatment and very low water rates. In such cases, it is possible for water rates to increase by three or four times their current levels.

If the existing water rates were to be, for instance, $100 annually, and the annual cost of a new treatment technology were to be $300, then there would be a quadrupling of the rates from $100 to $400. However, the $400 annual average water bill would not exceed affordability thresholds. Such rate shock is a barrier to the implementation of treatment technologies.

Rate shock can be diminished by phasing in the required rate increase over time. The problem with such a phase-in is that the water system must have the financial capacity to carry the difference between the lowered revenues it receives in the early period of the phase-in and the total cost of service. Slightly higher rates may be required once the full rate increase is implemented to ensure the capacity of the water system to make up for the lost revenues during the early stages of the rate phase-in. Another method of implementing a rate phase-in that would support financial capacity without the need for higher final rates would be to start the phase-in prior to the full expenditure of money. While systems regulated by State utility commissions usually are required to wait until the treatment plant is operational prior to increasing rates, there is precedent for allowing the phase-in of the rate increase as the money is spent toward the project. For systems that have local control of rate-setting, it would be easier to implement this type of phase-in. Financial assistance for capital expenditures can be structured so that the first payment due would occur after the completion of the project, a typical practice in many areas for administering the DWSRF. If the rates increased incrementally prior to the start of repayments, phasing would be easier and rate shock attenuated.

Conclusion

For many water systems, rate-setting techniques can be an effective method of ensuring safe and affordable drinking water for all of that system's users. The optimum use of affordability rate-setting is to limit those eligible to receive subsidized rates to low-income households. In systems that need to significantly increase rates to pay for needed infrastructure improvements, for example, rate shock may occur. The best way to alleviate rate shock is to phase in the rate increase over a period of time. It is important, however, that the phase-in be developed in a way that keeps the utility financially viable.

While affordability ratemaking can be an effective tool for an individual system to provide financial support to its low-income households, limiting needed subsidies from outside sources and the need for variance technologies, rate-setting is a local or State prerogative. EPA has limited, if any, authority in such matters. Nevertheless, EPA should provide information and examples to the States and to water systems that demonstrate how affordability ratemaking can be an effective tool.

3.2.2 Low Income Water Assistance Program

The Work Group recommends that EPA adopt a LIWAP as a means to assist low-income households facing high drinking water costs, funded with a Congressional appropriation similar to the funding for LIHEAP.[10]

[10] See Appendix 1 for minority views.

The real impact of water costs should be measured at the individual household or customer level, and most systems with an affordability gap have some users who are able to pay their water bills. However, other customers will not. While the ability of low-income households to afford their water service, especially when combined with sewer costs, merits national attention, this recommendation focuses on addressing low-income household water affordability when small system costs rise due to compliance with the SDWA. While there are federal assistance programs for other utility services, such as the LIHEAP for heating and cooling costs and the Universal Service Low Income Program for local phone service, there is no similar program for water. A national LIWAP is being recommended by the Affordability Work Group as another tool to help States assist low-income households facing increased rates due to costs associated with compliance with the SDWA. Adoption of a LIWAP could help offset the need for the use of variance technologies.

The LIWAP would be modeled on LIHEAP, using an annual block grant to the States funded through an annual appropriation. While systems should be strongly encouraged to use rate design to the extent practicable to address affordability issues for low-income consumers (as discussed in section 3.2.1), there are systems where rate design alone cannot ensure affordable rates for the low-income households served. This is where an outside source of funding is needed to help fill the "affordability gap" (see Appendix 7). LIWAP assistance would both benefit qualifying low-income households by promoting affordable water bills and help preserve a small system's revenue stream from the negative impact of too many low-income customers.

Structuring a LIWAP

The goal of a LIWAP is to assist low-income residential customers of small systems with high rates due to costs associated with compliance with the SDWA. The small system LIWAP described in this section directs assistance to the low-income consumers of systems undergoing compliance measures, as opposed to all low-income customers. This is a narrow universe of households, but one that addresses the specific low-income affordability issues explored by this Work Group. A LIWAP could promote compliance with the MCLs by protecting the most vulnerable segment of a small system's customers (those without the income elasticity to cover the costs of a system's compliance measures), while providing the system operators with adequate revenues to finance these requirements. Low-income customers facing the largest rate increases should be treated as a priority and receive more assistance. LIWAP could be part of a financial assistance package to eligible systems, but the beneficiaries would be low-income households.

The LIWAP would be modeled on the federal LIHEAP.[11] LIHEAP is an annual block grant to the States, funded through an annual appropriation by Congress, to help low-income households pay their heating and cooling bills. There is a separate LIHEAP emergency contingency grant that can be released at the Administration's discretion in response to a variety of crises. The authorizing statute directs the States to target assistance to vulnerable populations (the elderly, households with members with disabilities, households with young children, and low-income households with high energy burdens). The program sets an eligibility floor, 110

[11] 42 U.S.C §8621 et seq.

percent of poverty and a ceiling of 150 percent of poverty or 60 percent of the State median income. The statute also establishes categorical eligibility for individuals receiving Social Security, SSI, food stamps, or certain payments under the Veterans' and Survivors' Pension Improvement Act. Up to 15 percent (or 25 percent with a waiver) of the block grant may be used for weatherization or other energy-related home repair, and up to 5 percent can be used for services that encourage or enable households to reduce home energy needs including needs assessments, counseling, and assistance with energy vendors. States can use up to 10 percent of the block grant for administration of the program.

Many aspects of LIWAP could be patterned after the LIHEAP program. Eligibility for LIHEAP and other assistance programs such as the federal or State telephone lifeline rate program could qualify a household to receive LIWAP assistance. Using categorical eligibility could make administration of a LIWAP more efficient. If LIWAP is funded through a block grant like the LIHEAP program, States could set eligibility levels and benefit amounts, with priority given to low-income households facing the greatest rate increases.[12] As with the LIHEAP block grant, a LIWAP block grant would give the States the flexibility to tailor the LIWAP to address their own particular needs. States could be authorized to set aside a portion of LIWAP funds for more permanent measures to reduce low-income customer usage (such as leak repair or conservation measures for toilets and faucets).

LIWAP could be distributed to eligible households in a number of ways. States could determine how the assistance is applied for and distributed. They could consider administering LIWAP through the same agencies that administer other low-income benefits programs, such as LIHEAP.

The LIHEAP approach has worked well as a block grant that States can tailor to fit their needs. LIWAP could have conservation and rehabilitation components similar to those in LIHEAP, but its primary goal would be to address the ability of low-income households to access safe and affordable drinking water, especially where a small system's costs are increasing due to MCL compliance.

While some water systems may already have voluntary programs to provide assistance to low-income households, it is unlikely that these programs alone will adequately address the needs in small systems facing substantial compliance cost increases.

There is also the issue of water affordability for low-income households that do not pay water bills directly. Water is different from energy and telephones in terms of the percent of households that pay a water bill. These costs are frequently "invisible," included as part of a household's rent or mobile home space lease.[13] The Affordability Work Group made very clear

[12] Other factors that could be used to prioritize LIWAP assistance could include vulnerable populations, such as seniors, households with young children, and households with members whose medical conditions render them more susceptible to illnesses associated with drinking water contaminants.

[13] States have faced similar challenges in administering the federal low-income Weatherization Assistance Program. One way to address landlord-tenant billing issues is to have the landlord sign a contract with the State in which, as a condition of receiving LIHEAP, the landlord agrees to pass along the savings from a weatherized building to the tenants.

that in any case in which LIWAP assistance is provided to landlords, protections must be incorporated to ensure the benefits accrue to the disadvantaged tenants. An analysis of 1990 census data by Scott Rubin shows that nationwide, about 66 percent of households pay a water bill and that number is lower among low-income households (e.g., in 1989 around 50-60 percent of households with incomes below $25,000 paid a water bill).[14] The percentages vary greatly by region as well.

Coordination of LIWAP with Other Funds for Water

LIWAP is intended to be a tool to help address low-income water affordability. For a LIWAP to be most effective, State water administrators should have a role in determining how the assistance is targeted within the State. LIWAP assistance could also reach more low-income households when coupled with the types of rate setting techniques described in section 3.2.1. Should a program similar to LIHEAP be established, there should be an incentive (or penalty) to make sure that States actually use funds for low-income individuals. One way to ensure that LIWAP is appropriately directed is to have LIWAP appear as a credit on the low-income household's water bill. By providing subsidies directly to the utility to offset increased costs to disadvantaged customers of the system, States could also reduce their administrative burdens. States should be required to return to EPA any unused portion of the LIWAP after a set period of time.

Determining the Size of a Small System LIWAP

This subsection will discuss the determination of the funding requirement for a small system LIWAP subsidy. It should be noted that it is not possible to determine, especially on a national average basis, a subsidy amount that works well in all cases. The level of water rates varies greatly from system to system and the level of income in low-income households varies greatly, as does the poverty rate from State-to-State. A level of subsidy that is appropriate in one situation may not, therefore, be appropriate in another system or household. If LIWAP is structured as a block grant to States, States can use different methodologies to determine the amount of assistance per household.

It is not possible, or desirable, to fully subsidize the water bill of all low-income households without first considering the possibility of a water system using its own subsidy in the form of affordability rates, as discussed in section 3.2.1. In addition, the level of a funding base and the number of participating households will be critical factors in the determination of the actual amount of funding. The purpose of this analysis is, in part, to determine the appropriate total level of funding, on a national basis, to move toward a solution to the small system affordability problem by providing assistance to individual households.

While many different funding mechanisms could be used, the majority of the Work Group recommends a LIWAP structured similarly to LIHEAP. The individual household

[14] Scott Rubin, *A Nationwide Look at the Affordability of Water Service*, Proceedings of the 1998 Annual Conference of the American Water Works Association, Water Research, Vol. C, No.3, pp. 113-129 (American Water Works Association, 1998).

subsidy will be controlled by the amount of money in a LIWAP fund and the number of participating eligible households. For a LIWAP limited to low-income households (those eligible for LIHEAP), served by a small water utility (less than 3,300 population) with high annual water rates(>$500) due to compliance with regulatory requirements, the total annual required funding is estimated to be approximately $750,000.[15]

Variations of LIWAP Discussed, But Not Recommended

Another model, ultimately not recommended by the Work Group, is to distribute LIWAP in a manner similar to the federal telephone lifeline program. Under the Federal Universal Service Low-Income Programs (Lifeline and Link-Up), carriers apply to be "eligible telecommunications carriers." To receive Lifeline subsidies, the carriers must offer Lifeline and Link-Up to qualifying customers. The carriers are reimbursed for the discounted rates from the central entity that administers the program. Lifeline customers receive a credit on their monthly phone bills. The LIHEAP model and the telephone universal services model both require entities at the federal and State levels to administer the funds, however, the block grant model may be easier to administer since there are other assistance programs on which to piggy-back LIWAP.

Another variation of the LIWAP, but not recommended by the Work Group, is to address low-income water affordability through existing funding streams to the systems. At one time, Congress considered modifying the DWSRF to allow States to direct a certain percentage of their grants to "disadvantaged users." While this approach still provides assistance directly to the water utility, it results more directly in lower bills for low-income households. The Congressional Budget Office (CBO) has a favorable analysis on the direction of funds to address low-income household affordability in a November 2002 study, "Future Investment in Drinking Water and Wastewater Infrastructure." The CBO noted that federal assistance to households "could address distributional objectives with more precision and less loss of efficiency than can be achieved from aid for investment in water systems" and could be "more cost effective in achieving a given distributional objective."[16]

The Affordability Work Group does not recommend this approach because the usefulness of this mechanism is seriously undermined if there is no new funding for DWSRF to specifically cover this program. As an analogy, the DWSRF provision for "disadvantaged communities" is currently underutilized by the States, in part because of a concern about spending down the corpus of the State's DWSRF.[17] The Work Group felt that a modification to the DWSRF that allows States to target low-income households more directly would likewise be underutilized for the same reasons if there were no separate, new funding for the program.

There are numerous challenges to a LIWAP in terms of the political viability of such a program as well as efficient program administration. The majority of the Work Group

[15] Estimated by EPA consultants.

[16] CBO, "Future Investment in Drinking Water and Wastewater Infrastructure," November 2002, pp. 42-43.

[17] U.S. General Accounting Office, *Drinking Water: Key Aspects of EPA's Revolving Fund Program Need to Be Strengthened*, GAO-02-135, January 2002.

recommends the adoption of a small system LIWAP funded through a Congressional appropriation.

Possible Ways To Fund A LIWAP

Congressional Appropriations: An annual Congressional appropriation following an authorization is a potential source of funding. In establishing a LIWAP, Congress would make a finding that this program accrues to the general good. However, the appropriations process is highly political and unpredictable from year to year, and in the current economic and political climate, it would be difficult to fund LIWAP through a general appropriation.

Using the DWSRF as a Mechanism: LIWAP could be funded through increases in funding for the DWSRF, an option that has the advantage of funneling additional funds through an existing program. However, the DWSRF currently authorizes assistance to systems, not individuals, and would require a legislative revision to the authorization.

New Revenue Enhancements: A Drinking Water Assistance Fund could be created by establishing an affordability charge on all water bills as a cost per 1,000 gallons. However, since the LIWAP would serve only a subset of low-income households, the cost of establishing and administering a national water charge would be disproportionate to the modest level of assistance actually needed. LIWAP could also be funded through a bottled water tax. Such a fund would be substantial, fairly stable, and financed completely from discretionary spending. However, the industry being taxed would not benefit from the tax.

Conclusion

A LIWAP could create a sustainable and predictable fund for low-income household water affordability assistance. Payments through this fund could help preserve and enhance revenue streams for utilities, as they would have fewer "write offs," (unpaid and uncollectible bills), and/or disconnection and reconnection costs.

LIWAP could play a critical role in closing the affordability-gap for low-income households. As a tool to assure the affordability of treatment technology necessary for small systems to meet new regulations, the LIWAP should:

- Reduce administrative costs by piggybacking eligibility onto the existing LIHEAP.
- Express the intent to the States that the funds should be distributed to provide the highest amount of funding to the lowest-income households with the highest cost of water due to system compliance with regulatory requirements.
- Provide for cooperation between the State primacy agencies and LIHEAP administrators so the States target the distribution of LIWAP funds appropriately.
- Include sufficient LIWAP funding to cover the States' additional administrative costs.

3.2.3 Modifications to Existing Sources of Funding to Address Affordability

With regard to modifications to existing sources of funding to address affordability, the Work Group recommends:

- DWSRF funding should be increased, with special consideration given to assisting small systems.

- EPA should determine if, as a result of the current DWSRF allocation formula, small public water systems are being disproportionately denied funding from State DWSRF programs due to inadequate funding being available. [18]

- EPA should encourage States, that have not already done so, to establish a disadvantaged community program to address small system affordability issues. Such funding should be consistent with the principles in the DWSRF to encourage restructuring where viable.

- EPA should work with other agencies to help overcome barriers to effective use of existing funding sources to promote small system affordability for safe drinking water. Examples of such assistance include:

  - Increased outreach efforts to small systems of all classes to provide information on available funding programs.

  - Increased technical assistance to small water systems to address needs in the areas of funding applications, accounting and long-range planning, engineering and technical corrections, and record-keeping practices consistent with the needs for funding and SDWA requirements.

  - Improved opportunities of small systems to acquire funding from all sources, governmental and private. Increased use of grant funds, zero-interest loans, and other means of assistance to low-income water systems in need.

  - Analyze methods of removing institutional barriers at both the State and federal levels that prevent small systems from obtaining funding and complying with SDWA requirements in an affordable manner.

  - Establish new, and expand existing, sources of funding to provide assistance to small systems in all areas of achieving and maintaining system capacity.

Introduction

Existing State and federal funding programs provide financial assistance to water utilities that help make the cost of water affordable as significant infrastructure improvements and new

[18] See Appendix 1 for additional comments.

regulatory demands are required. The purpose of this section is to provide some background on these existing sources of funding and to propose approaches for optimizing the use of these funds so that small water systems can provide safe drinking water at affordable prices. The section first outlines information on the financial support that federal agencies and States have historically provided for water infrastructure improvements. It then looks at barriers to the optimum use of this existing funding for small system affordability and ways to overcome those barriers. The section next discusses some existing programs for providing assistance to individual households in order to promote affordability. Finally, the section presents recommendations for improving the existing funding sources' ability to help small systems provide safe drinking water at affordable rates.

Existing Sources of Funding

Providing safe drinking water to the 254 million people served by the approximately 55,000 CWSs in the United States is an important goal of federal, State, and local officials. While our drinking water is among the safest in the world, the owners and operators of the nation's public water systems know that they must make significant infrastructure improvements to continue supplying safe drinking water to their customers. A 1999 EPA survey of drinking water infrastructure needs identified a 20-year need of more than $150.9 billion. Approximately one-quarter of this total national need ($31.2 billion) is for small systems serving up to 3,300 people. While user rates serve as the major source of system financing, federal and State government agencies offer financial support as well.

According to a General Accounting Office (GAO) report, from fiscal year 1991 through fiscal year 2000 nine federal agencies made available about $44 billion in funds for drinking water and wastewater capital improvements. Four agencies including EPA, the Department of Agriculture (USDA), HUD, and the Department of Commerce, accounted for about 98 percent of this total. Also, according to GAO, over the past 10 years State governments made a total of about $25 billion in State funds available for water infrastructure programs. The break down is as follows:

- $10.1 billion to match EPA's capitalization grant
- $9.1 billion in grants and loans committed under State-sponsored programs
- $4.4 billion in loans made possible by selling general obligation and revenue bonds (in States).

Through water and sewer bills, local citizens and private businesses pay about $60 billion annually, or 90 percent of the total cost, to build, operate, and maintain drinking water and wastewater systems.[19]

[19] Water Infrastructure Now, "Recommendations for Clean and Safe Water in the 21st Century," Water Infrastructure Network Report, February 2001, p. 2.

DWSRF Funds

Many public water systems, particularly small water systems, have difficulty obtaining affordable financing for infrastructure improvements. Recognizing this fact, Congress established the DWSRF program as a part of the 1996 SDWA Amendments. For fiscal years 1994 through 2003, Congress authorized $9.6 billion in new federal funding to help ensure that the nation's drinking water remains safe and affordable. The DWSRF program was modeled, in part, after the Clean Water State Revolving Fund (CWSRF) program initiated in the late 1980s under the Clean Water Act.

EPA distributes DWSRF funds to each of the 50 States and Puerto Rico in the form of capitalization grants. As of June 30, 2002, EPA had awarded more than $4.3 billion in DWSRF grants to States for drinking water projects. States use the grants to capitalize revolving loan funds from which low-cost loans and other types of assistance are provided to eligible systems to finance the costs of infrastructure projects. States must provide matching funds equal to at least 20 percent of each grant. As of June 30, 2002, State matching funds have added more than $1 billion to the program. Loan repayments made by assistance recipients return to the revolving loan fund and provide a continuing source of financing for infrastructure projects.

The 1999 EPA survey of the drinking water needs indicated that $31.2 billion was needed to address total regulatory compliance for the next 20 years. Of this total, $21.7 billion reflected compliance needs associated with existing SDWA regulations, $0.2 billion for American Indian and Alaska Native systems, and $9.3 billion reflected compliance needs associated with proposed or recently promulgated SDWA regulations.

The 1999 EPA survey indicated that the total need for the approximately 55,000 CWSs (those that are State-regulated and those that serve American Indian and Alaska Native populations) and 21,400 not-for-profit non-community water systems was $150.9 billion. The survey indicated that out of the total $150.9 billion needed, $61.8 billion was attributed to 886 of the largest water systems (serving 50,000 persons or more), and $79.8 billion was attributed to the needs of small and medium-size community water and not-for-profit non-community water systems. In other words, 886 large systems represent 41 percent of the total need and, in contrast, approximately 55,000 small and medium community water systems and 21,400 not-for-profit non-community water systems represent 53 percent of the total need. The remaining need (6 percent) is associated with costs for proposed and recently promulgated SDWA regulations.[20]

The allotment of DWSRF to the States ensures that each State receives 1 percent of the total funding, based on a formula that calculates a ratio involving the extent to which States exceed or fall short of the 1 percent threshold, and then multiplies a State's allotment by this ratio. This represents the distribution of funds from about $8 million (1 percent States) to about

[20] The 1999 EPA survey estimates of $61.8 billion for large systems and $77.6 billion for small and medium size community water systems and not-for-profit non-community water systems exclude needs associated with proposed or recently promulgated SDWA regulations. The impact on different-sized systems cannot be determined for EPA's estimate of $9.3 billion to comply with proposed or recently promulgated SDWA regulations. See U.S. EPA, "Drinking Water Infrastructure Needs Survey," EPA 816-R-01-004, February 2001.

$80 million (the largest amount received by only one State) based on the FY 2002 national appropriation of $850 million.

Barriers to Compliance and Affordability for Small Systems Using Existing Funding Sources

Approximately 93 percent of community water systems are small systems, many of which serve fewer than 3,300 people. Small systems have certain characteristics that make compliance with minimum standards difficult without outside assistance. These characteristics include very small staff, extremely limited financial resources, and a small and, in some cases, widely distributed customer base. These systems often need financial assistance to provide safe water to their communities, but find it difficult to obtain funding for either their compliance or infrastructure improvement needs. This is one of the reasons that the majority of violations occur in small systems. The financial barriers highlight the importance of the DWSRF Program as an important source of affordable funding for small systems and accounts for why 75 percent of total loans awarded by the States have gone to small systems.

Funding Program Rules Limit Their Effectiveness for Small Systems

All federal and State programs place limits on the use of their funds. State program limitations often are different from federal program limitations, thereby creating a situation in which state funds can often be creatively packaged with federal funds.

Nonetheless, there are a number of limitations that have proven to be especially challenging barriers. Many programs have ceilings on the amount they will loan to any one entity. RUS grants, for example, are limited to the amount needed to establish reasonable user rates and cannot exceed 75 percent of eligible project costs. Thus, grant recipients must provide matching funds, even though their MHI is below the statewide non-metropolitan average. These funding restrictions are particularly frustrating for systems wishing to consolidate, as they generally require a larger funding package.

While some federal funding programs, such as the RUS, provide assistance for preparing loan or grant applications and for project planning and design, others do not. A number of states, including South Carolina, Virginia, Missouri, and Oregon, use DWSRF funds to assist small systems in hiring engineering firms to prepare project plans and specifications or offer the assistance of their own program staff. However, some states require systems to choose between a funding source that pays for project planning and review and a source that provides no up-front assistance but provides a lower interest rate.

Finally, small privately owned systems face their own unique obstacles to receiving DWSRF funding. Most small water systems are privately or investor-owned. Several states have legislative, regulatory, or policy-based restrictions on providing assistance to private or investor-owned systems. This is, in part, out of concerns for endangering the tax-exempt status of bonds issued for the state match. In addition, some states without legal restrictions still have yet to provide any DWSRF assistance to private systems. States have indicated that the

disproportionately low figure of DWSRF funding for private systems is the result of either a lack of demand or a reluctance to provide assistance due to the creditworthiness of these applicants. Overall, 57 percent of the nation's CWSs are privately or investor-owned, though they account for only 9 percent of DWSRF assistance agreements.

Lack of Coordination by Funding Agencies

Because federal and state programs have their own statutory and regulatory constraints, states cannot coordinate funding without substantial effort. While the goals of various funding programs are similar, their eligibility criteria – such as the size and type of system eligible to apply – alone may impede systems' efforts to fund infrastructure projects. In addition, programs have varying timetables for processing applications and/or awarding grants or loans. Systems applying for multiple loans or grants to fund a project must carefully coordinate their applications to avoid project delays. This is evident in the experiences of Franklin County, Georgia, which had to prepare six different application packages to fund a water and sewer project. The project was completed 5 years after it was proposed because of funding delays; many of the funding sources required that other sources of funding be secured before their own were granted.

Coordinated funding, however, may simplify the funding search, application, and review processes at the federal, state, and local levels, saving systems and funding agencies both time and expense. Many states have been working to coordinate their funding processes and criteria. For example:

- In Montana, a coordination team developed a uniform application for all infrastructure funding programs. The State has streamlined several procedures including money tracking, environmental assessments, and supplemental contracts.

- Pennsylvania's Uniform Environmental Review (UER) process, finalized in July 2001, standardizes the process for documenting the environmental effects of proposed drinking water and wastewater infrastructure projects requiring financial assistance from a number of federal funding sources. The process should coordinate the environmental review of projects, helping to avoid the duplication of work by multiple agencies. Participating programs and agencies include the DWSRF, RUS, CDBG, and EPA.

- The California Financing Coordinating Committee (CFCC), a formal committee created in 1998, is composed of representatives from numerous State and federal agencies. CFCC sponsors funding fairs for funding agencies to explain their programs and discuss specific plans; hosts an annual public financing conference; signed and updated a joint Memorandum of Understanding; and maintains a Web site with information on funding programs and information on coordinated funding efforts in place.

Disincentives for Regionalization

Disincentives for regionalization are inherent in the limitations on use of funds, as described above in Section A. If the size of loans or grants is strictly limited, a regional consortium cannot obtain sufficient funds to consider a large-scale consolidation. If the loan or grant provisions fail to provide for planning and design funds, systems may be unable to pay for the up-front services that may be required for successful regionalization.

An additional disincentive for regionalization is the lack of a comprehensive understanding among funding programs that least-cost solutions to small system problems should be actively sought. There is no authority at EPA or in the states who can require all funding agencies to adhere to a planning process requiring consideration of regional alternatives. Lacking that authority, funding agencies continue to support sub-optimal solutions for water systems. These sub-optimal solutions, while consistent with the agencies' overall mission, are inconsistent with a strategy to promote lasting, least-cost solutions. Thus, some current funding decisions create barriers to regionalization. One of the barriers is earmarked Congressional appropriations. States report that it is not uncommon for a system to end-run a state program designed to promote regionalization through a Congressional earmark.

However, EPA continues to talk about regionalization as one of the best means to achieve adequate capacity for small systems. A number of states are also actively promoting regionalization or consolidation. For example, the State of Alabama, working with the RUS, provided funding for extension of transmission lines, creating a near state-wide distribution "grid." California's DWSRF program requires that all systems applying for DWSRF funding consider consolidation as an alternative to their proposed projects. In addition, a number of states give higher priority rankings or additional points to systems considering consolidation in a DWSRF loan application.

Impact of Section 1926(b) on Consolidation. Section 1926(b) of the Consolidated Farm and Rural Development Act prohibits "curtailment or limitation of service" provided by water systems that have outstanding loans from the RUS.

> "The service provided or made available through any such association shall not be curtailed or limited by inclusion of the area served by such association within the boundaries of any municipal corporation or other public body, or by the granting of any private franchise for similar service within such area during the term of such loan; nor shall the happening of any such event be the basis of requiring such association to secure any franchise, license, or permit as a condition to continuing to serve the area served by the association at the time of the occurrence of such event."[21]

The prohibition means that the service area of a system with an outstanding loan is protected against annexation or "cherry picking" of customers. The theory behind the statute is that any such curtailment or limitation of service would increase the risk of a system defaulting on its RUS loan. The prohibition therefore protects the integrity of the federal government's outstanding loans.

[21] 7 U.S.C. §1926(b)

There are three different perspectives from which one can view the impact of section 1926(b). First, from the standpoint of the lending agency (the RUS), this provision was passed in 1961 as a means of protecting the ability of systems to repay their loans. As a prudent lender, the RUS wants to protect their systems from default.

The second perspective is that of the National Rural Water Association (NRWA) as an advocate for small water systems. Their argument is that well-managed small systems should not be subject to "cherry picking" by adjacent larger systems. Even if this did not damage the ability of the small system to repay debt, it is not sound public policy (in the NRWA view) to allow a large system to force financial hardship on a small system by taking away its customers. In an industry that is asset-intensive, an involuntary reduction in customers leaves a stranded asset base that increases the cost of service for remaining customers. In other words, the prohibited "cherry picking" also could cause problems of affordability.

The third perspective is that of larger systems which are being urged by EPA to assist in consolidation of systems. Under the SDWA Amendments of 1996, consolidation of water systems is seen as a desirable goal. As such, the National League of Cities has asked Congress if it were willing to "remove federal impediments to consolidation – for example, section 1926(b) of the Agriculture Act of 1961, which disallows absorbtion of any drinking [water] system indebted to the Farmers Home Administration. Numerous cities have attempted to expand their service areas to unincorporated areas served by these small systems, or to areas surrounding the small system service areas. Federal law precludes them doing so. Many of these small systems are inefficient and marginally protective of public health. State and local efforts at consolidation in such areas have been barred – by federal law."[22]

In the context of barriers to affordability in small systems, section 1926(b) represents two types of conflicts. First, there is a statutory principle that may lead to conflict between the RUS and other federal or State agencies. The RUS is a lender with legitimate policy concerns about the repayment of loans. The role of the RUS as lender may (from time to time) be inconsistent with other federal or State policies such as regional solutions (including annexation) or other types of consolidation. The RUS mission of assistance to low-income rural communities may not always be consistent with an emerging interest in regional, least-cost alternatives.

Second, there are honest differences of opinion about how best to achieve affordable drinking water in rural communities. Small, rural systems would argue that if they are well managed, the worst outcome would be to allow larger systems to "cherry pick" their customers, thereby making water less affordable for their remaining customers. Large systems would argue that all (or most) small systems are inefficient. Therefore, the least-cost solution for the largest number of people is achieved by consolidation, including annexation.

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[22] Testimony of Alderman Joseph A. Moore, Chicago, Illinois, on behalf of National League of Cities before the Environment and Public Works Committee, United States Senate, March 2002, reprinted by the National League of Cities at http://www.nlc.org.

This is an important policy issue for both the NRWA and the National League of Cities. It raises the question of whether a Department of Agriculture statute is creating barriers to consolidation.

Underutilization of DWSRF Funds for Disadvantaged Communities

Funding provisions for disadvantaged and small communities may take a number of different forms. States must make at least 15 percent of DWSRF funds available to small systems (a provision that has been exceeded with approximately 40 percent of loan funds overall going to small systems as of June 30, 2002). In addition, states may provide up to 30 percent of their capitalization grants to disadvantaged communities. This effort is voluntary, and some states have no programs for disadvantaged communities. Finally, states may set aside an overall sum of 31 percent of their annual DWSRF appropriation for program administration, technical assistance to small systems, program management, local assistance, and other state programs. This 31 percent could potentially provide states with additional resources to assist disadvantaged communities.

Applicants that serve disadvantaged communities may be eligible for DWSRF principal forgiveness (as done by 16 states) and extended repayment terms of up to 30 years (done in 20 states). States may also offer other subsidies to disadvantaged communities, including lower interest rates, no-interest loans, and negative interest loans. Twenty-nine states with disadvantaged assistance programs have made 625 assistance agreements totaling $837.5 million as of June 30, 2002.

To date, however, states have underutilized the resources available to assist disadvantaged communities. No state has used the full 30 percent of its capitalization grants for disadvantaged assistance. This may simply be a start-up phenomenon, or it may reflect reluctance on the part of states to use all forgiveness provisions in the funding available in the absence of a long-term Congressional commitment to DWSRF funding. In response to the latter, states must address an important operating question: What portion of the fund can be allocated to systems in the form of loans with principal forgiveness? These forgiven loans undermine the ability of the DWSRF to be self-financing in the future on the one hand, but on the other hand offer a means of assisting the neediest small systems.

Increasing use of loans to small disadvantaged communities has two effects on the DWSRF: increased administrative costs (as a percentage of loan value) and increased likelihood of default by systems that lack financial capability. These concerns are manifested in the organization of existing state disadvantaged assistance programs. These programs are tied to capitalization grants. If capitalization grants were to cease, States would not be able to use funds for principal forgiveness.

Another factor that may explain the underutilization of the DWSRF special funding provisions for small and disadvantaged communities is the fact that the Public Water System Supervision (PWSS) primacy agency often does not make the DWSRF financial decisions. In many States, administration of the DWSRF is combined with that of the CWSRF in a different state agency. The financing agency may have different incentives from those of the primacy

agency. Its actions may be aimed primarily at the maintenance of a self-funding revolving fund. Risky loans, or loans with principal forgiveness, are inconsistent with prudent lending practices that are important to a self-sustaining loan fund.

Overcoming Difficulties Faced By Small Systems in Applying for Funds

The Work Group recommendations emphasize that the methods of first choice in dealing with the very small system barriers are the appropriate cooperative strategies discussed in this section. However, if none of these are available to aid in achieving compliance, programs could be adopted that will help overcome some of the small system limitations and barriers.

System knowledge. There are approximately 32,000 CWSs that serve fewer than 500 people. Almost 13,000 of these systems (40 percent of the total) are "ancillary systems," i.e., the provision of water to the public is ancillary to their primary business such as operating a mobile home park. About 5,000 of these systems are homeowners' associations. Homeowners' associations and other ancillary systems have many competing responsibilities, which limit their ability to deal with the increasingly complex issues of water system funding and compliance.

State outreach efforts have been primarily aimed at governmental entities such as cities, towns, and water districts. The privately owned water systems (most ancillary systems are privately owned) need to be included in the scope of small system assistance and funding available through numerous state programs. Many states do not provide funding to private systems, and there has been little effort to find effective methods to provide information on compliance and funding programs for these systems.

EPA and the States need to increase efforts to provide assistance, including funding to small independent water systems. Programs could be carried out either by states or through the many existing local and rural training programs. Training can be provided directly or through contracts and funded from DWSRF set-asides, small system training funds, and operator certification training programs.

Managerial capacity. Systems serving fewer than 500 people (32,000 of the 55,000 CWSs) usually have part-time personnel or are operated by the owner of the business that the system services. Quite often, operators with limited education and many responsibilities must confront the application and regulatory process, which can be daunting, and additional engineering, accounting, recordkeeping, and legal expertise is needed.

Simplifying the application process at the state and federal levels would help. What is urgently needed is more funding for the kinds of assistance currently provided by Rural Water Associations, AWWA Sections, Rural Community Assistance Programs, and other technical assistance programs. The needs include application completion, accounting practices, and engineering requirements for system cooperative effort and upgrades. Assistance to small systems is often provided by large systems, but usually as time permits, and is generally inadequate to address the many small systems in need. (See recommendations for financial assistance.)

Financial capacity. Before lending agencies will fund small water systems, they require adequate proof that the systems will be able to repay a loan. A system with deteriorated assets, low income, and extensive need is not a very good risk. Collateral is virtually non-existent. There are many reasons why small systems cannot demonstrate their credit-worthiness. Lack of an accounting system and poor recordkeeping are common. Rate structures cannot support repayment. The very nature of a small system lends itself to disregarding common business and accounting practices for water systems until the deficiencies become overwhelming.

States are very active in ensuring, under SDWA requirements, that new systems have the necessary financial capacity to operate into the foreseeable future. However, assistance and education are needed for the many existing systems that are in serious need when a cooperative solution is not feasible. Such systems may need assistance to secure adequate operating funds, meet new requirements, and improve systems to ensure adequate long-term financial capacity.

Institutional Barriers. Both state and federal actions will be necessary to deal with these problems. Federal regulations, the SDWA, or state implementation programs frequently do not take into account the small, poor systems that are facing major affordability problems without the ability to obtain assistance. Some states do not allow the use of federally established set-aside programs that were designed to assist small systems by funding technical assistance and training programs. Some solutions can come only from the States, such as providing interest-free loans, grants, easier application processes, and the assistance necessary to develop capacity in all public water supplies, regardless of size or ownership.

3.2.4 New Sources of Funding to Address Affordability

The Work Group's recommendations with respect to establishing new sources of funding are as follows:

- Provide additional funding beyond the current DWSRF funding for small systems to adopt cooperative strategies, as broadly defined in section 4.2.1.

- Explore and consider the use of other state and federal agencies, such as the U.S. Army Corps of Engineers and the Bureau of Reclamation, to assist small drinking water-related projects.

Introduction

Additional financial assistance is necessary because new infrastructure and technologies to meet compliance can be very expensive, particularly for small systems that have had little or no treatment in the past. Small systems have so few rate payers to absorb these costs that it is important to encourage as many of these small systems as possible to restructure or pursue cooperative strategies that reduce their costs and allow the costs to be shared by more rate payers.

Possible Sources of Funding

Additional sources of funding may be made available through expanding the scope of existing programs or the development of new programs.

Small System Grant Program for Cooperative Strategies

To encourage cooperative strategies among small water systems, a Small System Grants Program for Cooperative Strategies could be federally funded with monies over and above those appropriated for the DWSRF. Grants (with a small match from the system) would be awarded to systems that cannot afford to bring their water into compliance with drinking water health standards because of the small number and low-income of their customers. Projects eligible for grants would be those that assess and implement cooperative or restructuring strategies which will enhance the future financial sustainability of one or more small systems. Grants would also fund small system treatment or other drinking water infrastructure projects, but would require that those projects integrate the assessment and implementation of cooperative and restructuring strategies into the infrastructure project. States should be encouraged to add more monies to increase the funds available for encouraging cooperative strategies among small water systems through these small system grants.

Advantages of this program. There are many advantages to a grant program that is dedicated to funding cooperative or restructuring projects and funded with federal monies. Federal funding, with a small match such as 20 percent by the system or state, is essential because states alone do not have the financial resources to provide this support. The federal cost of supporting these cooperative and restructuring projects – that sometimes entail large initial expenditures – is spread more equitably through the progressive national income tax.

Because these small system assistance grants would be separate from the DWSRF monies, the program would be less likely to be regarded as reducing the ability of the DWSRF to fund larger system needs for infrastructure replacement as well as new treatment systems. In turn, this program could provide a strong incentive for state drinking water agencies and the water systems to thoroughly investigate possible restructuring options in each case and save the DWSRF monies for those small remote communities with water systems that are impractical to restructure. If small system assistance grants are not tied to cooperative restructuring activities, they could encourage long-term dependence on federal dollars by too many financially unsustainable small systems. It has also been noted that reserving the availability of the fund's dollars solely for projects that include cooperative or restructuring activities may provide incentives to county and state governments to remove state financing, taxation, regulatory, and other barriers to restructuring.

Disadvantages of this program. This new program may decrease available federal funds needed for larger system treatment and distribution system infrastructure. Alternatively, the standalone funding for the small system assistance grants could make the whole program easier to cut during the Congressional appropriation process. As a separate program, it could require additional state-level staff to administer. This program, as envisioned here, does not solve the problem of many systems that are non-sustainable because of high operations and maintenance

costs. In addition, in the current economic and political climate, any increase in appropriations for drinking water utilities may be difficult to obtain.

Overall, in addition to a LIWAP that directs support to the household level of the small system, new funding would aid in solving the affordability issue at the system level. Increased appropriations will be used to enhance programs to help make technology and infrastructure improvements affordable for small systems. Most Work Group members believe that any new funding sources should be used for infrastructure only. Funds to support operations and maintenance at the system level should not be included, because that would only prolong the non-sustainability of the system.

Recommendation

- EPA should encourage States, that have not already done so, to establish a disadvantaged community program to address small system affordability issues. Such funding should be consistent with the principles in the DWSRF to encourage restructuring where viable.[23]

It was recognized that even when all small systems experience fewer barriers to receiving loans for compliance infrastructure and make use of restructuring or cooperative strategies, where possible, to lower and spread the costs to their customers, some systems would still find achieving compliance with some water quality rules unaffordable for their customers. Data studied by the Work Group, however, indicated that the number of small water systems whose water bills after compliance with a new rule would be greater than what the MHI of their customers could afford, would be manageable. Statistics given to the Work Group and generally accepted indicated that the required funding to assist this subset of systems would be relatively modest (less than 1 percent of the current total U.S. financial assistance to public water systems.

It was recognized that such funding must be supplied in a manner consistent with the principles of the DWSRF. Small systems must first make every effort to restructure and use other strategies to achieve maximum fiscal sustainability before receiving this priority funding.

Increase use of existing agencies in providing infrastructure support for drinking water systems

Funding from other federal agencies such as the U.S. Army Corps of Engineers or the Bureau of Reclamation should be explored. These agencies should be tasked with increasing their authority to assist small systems. They could be particularly helpful in providing cooperative assistance through interconnecting small systems where feasible and where such interconnections would promote affordability. This approach may be an access to additional funds. Some funding may also be available from the new Homeland Security Program.

Eligible taxpayers should be encouraged to apply for the underutilized earned-income tax credit (EITC). Although this would not require establishment of a new funding source, it is one

[23] See Appendix 1 for minority views.

way to get more money to poor families. Within this system, one might also consider use of rate structures to address affordability problems. (Maybe some DWSRF for disadvantaged communities can be channeled here.)

Systems should be helped to establish "Lifeline" rates/low-income discount rates/discounted rates to "vulnerable" populations such as the elderly, young children, people with disabilities, etc. Some mechanism would be necessary to allow systems to make up the gap in the revenue stream created by adjusting rates for the disadvantaged population. For example:

- Percentage of income plans (e.g., if at least X percent of a household's income is paid on its water bill, its service will not be cut off);
- Payment restructuring programs (arrearage forgiveness, budget billing); and
- Customer charge waivers.

3.3 Recommendations

In summary, the Work Group offers the following recommendations regarding financial assistance strategies to help small drinking water systems comply with the SDWA:

- EPA should provide information and examples pertaining to the use of affordability rates for systems to help make water affordable to low-income households.[24]

  While EPA is not a rate-making agency, the use of affordability rates can be an effective tool for many systems, both large and small, to allow for infrastructure improvements needed to meet regulatory requirements without the need for variance technologies. By EPA providing information and examples of such rate-making ideas to water systems, more systems may take advantage of this tool.

- Adopt a Low Income Water Assistance Program (LIWAP) as a means to assist low-income households facing high drinking water costs, funded with Congressional appropriations similar to the funding for LIHEAP.[25]

  By targeting funding assistance to low-income households served by small systems (<3,300 population) that face significant rate increases to ensure compliance with regulatory requirements, better utilization of limited funding for making water affordable to all households with less use of variance technologies can be accomplished. Piggybacking eligibility requirements for such households onto existing programs, such as LIHEAP, can save administrative costs. A limited LIWAP program, as described above, may require as little as $750,000 in additional funding.

[24] See Appendix 1 for minority views.

[25] See Appendix 1 for minority views.

- DWSRF funding should be increased, with special consideration given to assisting small systems.

  In order to lessen the need for variance technologies, additional funding for the DWSRF, targeted to small systems, would be effective.

- EPA should determine if, as a result of the current DWSRF allocation formula, small public water systems are being disproportionately denied funding from State DWSRF programs due to inadequate funding being available.[26]

- EPA should encourage States, that have not already done so, to establish a disadvantaged community program to address small system affordability issues. Such funding should be consistent with the principles in the DWSRF to encourage restructuring where viable.[27]

  To ensure the most effective use of grant funding to help achieve affordable safe drinking water, targeting compliance assistance funding to the systems most in need should be a priority. It is important, however, that grants not be given to disadvantaged systems that, after the grant, will not have managerial, technical, and financial capacity to operate over the long term. Since restructuring can be the most effective tool in ensuring such long-term capacity, priority should be given to using the funds for such restructuring purposes.

- EPA should work with other agencies to help overcome barriers to the effective use of existing funding sources to promote small system affordability for safe drinking water. Examples of such assistance include:

  - Increase outreach efforts to small systems of all classes to provide information on available funding programs.

  - Increase the technical assistance to small water systems to address needs in the areas of funding applications, accounting and long-range planning, engineering and technical corrections, and record-keeping practices consistent with the needs for funding and SDWA requirements.

  - Improve the opportunities of small systems to acquire funding from all sources, governmental and private. Increase the use of grant funds, zero interest loans, and other means of assistance to low-income water systems in need.

[26] See Appendix 1 for additional comments.

[27] See Appendix 1 for minority views.

  - Analyze methods of removing institutional barriers at both the State and federal levels that prevent small systems from obtaining funding and complying with SDWA requirements in an affordable manner.

  - Establish new, and expand existing, sources of funding to provide assistance to small systems in all areas of achieving and keeping system capacity.

- Provide additional funding beyond the current DWSRF funding for small systems to adopt cooperative strategies as broadly defined in section 4.2.1.

  Cooperation between small systems can take many forms. It is one of the best methods for allowing small systems to achieve financial, managerial, and technical capacity for long-term sustainability as well as to meet compliance requirements without the need to use variance technologies.

- Explore and consider the use of other state and federal agencies, such as the U.S. Army Corps of Engineers and the Bureau of Reclamation, to assist small drinking water-related projects.

By expanding the use of such existing programs in the ways discussed above, compliance requirements may be achieved without undue cost and without the need to use variance technologies.

TABLE 2: RATEMAKING TABLE - LIFELINE RATES EXAMPLE, ALL CUSTOMERS ELIGIBLE, IN DOLLARS

A. EXAMPLE OF LIFELINE RATES USING SERVICE CHARGE AND CONSUMPTION CHARGE TARIFF DESIGN
COMPARISON OF UNIFORM CONSUMPTION RATE AND INCLINING BLOCK RATE

Customer Base			Modified Cost of Service Rates				Uniform Lifeline Rates				Inclining Block Lifeline Rates			
Monthly Consumption (1,000 Gal.)	Number of Bills	Total Consumption (1,000 Gal.)	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Annual Revenues	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Annual Revenues	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Annual Revenues
1	25	25	$ 15.00	$ 3.00	$ 18.00	$ 5,400	$ 6.33	$ 4.00	$ 10.33	$ 3,099	$ 5.48	$ 2.00	$ 7.48	$ 2,244
3	100	300	$ 15.00	$ 3.00	$ 24.00	$ 28,800	$ 6.33	$ 4.00	$ 18.33	$ 21,996	$ 5.48	$ 2.00	$ 11.48	$ 13,776
5	200	1,000	$ 15.00	$ 3.00	$ 30.00	$ 72,000	$ 6.33	$ 4.00	$ 26.33	$ 63,192	$ 5.48	$ 2.00	$ 15.48	$ 37,152
7	300	2,100	$ 15.00	$ 3.00	$ 36.00	$ 129,600	$ 6.33	$ 4.00	$ 34.33	$ 123,588	$ 5.48	$ 4.00	$ 33.48	$ 120,528
10	200	2,000	$ 15.00	$ 3.00	$ 45.00	$ 108,000	$ 6.33	$ 4.00	$ 46.33	$ 111,192	$ 5.48	$ 4.00	$ 45.48	$ 109,152
15	100	1,500	$ 15.00	$ 3.00	$ 60.00	$ 72,000	$ 6.33	$ 4.00	$ 66.33	$ 79,596	$ 5.48	$ 4.00	$ 65.48	$ 78,576
20	50	1,000	$ 15.00	$ 3.00	$ 75.00	$ 45,000	$ 6.33	$ 4.00	$ 86.33	$ 51,798	$ 5.48	$ 6.00	$ 125.48	$ 75,288
30	25	750	$ 15.00	$ 3.00	$ 105.00	$ 31,500	$ 6.33	$ 4.00	$ 126.33	$ 37,899	$ 5.48	$ 6.00	$ 185.48	$ 55,644
Total	1,000	8,675				$ 492,300				$ 492,360				$ 492,360

B. EXAMPLE OF LIFELINE RATES USING MINIMUM BILL AND CONSUMPTION CHARGE TARIFF DESIGN
COMPARISON OF UNIFORM CONSUMPTION RATE AND INCLINING RATE USING 5,000 GALLONS PER MONTH MINIMUM CONSUMPTION

Customer Base			Modified Cost of Service Rates				Uniform Lifeline Rates				Inclining Block Lifeline Rates			
Monthly Consumption (1,000 Gal.)	Number of Bills	Total Consumption (1,000 Gal.)	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Annual Revenues	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Annual Revenues	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Annual Revenues
1	25	25	$ 29.10	NA	$ 29.10	$ 8,730	$ 21.00	NA	$ 21.00	$ 6,300	$ 17.72	NA	$ 17.72	$ 5,316
3	100	300	$ 29.10	NA	$ 29.10	$ 34,920	$ 21.00	NA	$ 21.00	$ 25,200	$ 17.72	NA	$ 17.72	$ 21,264
5	200	1,000	$ 29.10	NA	$ 29.10	$ 69,840	$ 21.00	NA	$ 21.00	$ 50,400	$ 17.72	NA	$ 17.72	$ 42,528
7	300	2,100	$ 29.10	$ 3.00	$ 35.10	$ 126,360	$ 21.00	$ 5.04	$ 31.08	$ 111,888	$ 17.72	$ 5.00	$ 27.72	$ 99,792
10	200	2,000	$ 29.10	$ 3.00	$ 44.10	$ 105,840	$ 21.00	$ 5.04	$ 46.20	$ 110,880	$ 17.72	$ 5.00	$ 42.72	$ 102,528
15	100	1,500	$ 29.10	$ 3.00	$ 59.10	$ 70,920	$ 21.00	$ 5.04	$ 71.40	$ 85,680	$ 17.72	$ 5.00	$ 67.72	$ 81,264
20	50	1,000	$ 29.10	$ 3.00	$ 74.10	$ 44,460	$ 21.00	$ 5.04	$ 96.60	$ 57,960	$ 17.72	$ 7.50	$ 130.22	$ 78,132
30	25	750	$ 29.10	$ 3.00	$ 104.10	$ 31,230	$ 21.00	$ 5.04	$ 147.00	$ 44,100	$ 17.72	$ 7.50	$ 205.22	$ 61,566
Total	1,000	8,675				$ 492,300				$ 492,408				$ 492,390

TABLE 3: RATEMAKING TABLE - AFFORDABILITY RATES EXAMPLE, LIFELINE FOR LOW-INCOME CUSTOMERS ONLY, IN DOLLARS

A. EXAMPLE OF LIFELINE RATES USING SERVICE CHARGE AND CONSUMPTION CHARGE TARIFF DESIGN
COMPARISON OF UNIFORM CONSUMPTION RATE AND INCLINING BLOCK RATE

Customer Base				Uniform Lifeline Rates for Eligible Customers						Inclining Block Lifeline Rates for Eligible Customers					
Monthly Consumption (1,000 Gal.)	Number of Bills	No. of Low Income Eligible Bills	Total Consumption (1,000 Gal.)	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Lifeline Service Charge	Lifeline Monthly Charge	Normal Monthly Charge	Total Annual Revenues	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Lifeline Service Charge	Lifeline Monthly Charge	Normal Monthly Charge	Total Annual Revenues
1	25	5	25	$ 15.00	$ 3.16	$ 5.75	$ 8.91	$ 18.16	$ 4,893	$ 10.75	$ 2.01	$ 5.00	$ 7.01	$ 12.76	$ 3,483
3	100	18	300	$ 15.00	$ 3.16	$ 5.75	$ 15.23	$ 24.48	$ 27,378	$ 10.75	$ 2.01	$ 5.00	$ 11.03	$ 16.78	$ 18,894
5	200	35	1,000	$ 15.00	$ 3.16	$ 5.75	$ 21.55	$ 30.80	$ 70,035	$ 10.75	$ 2.01	$ 5.00	$ 15.05	$ 20.80	$ 47,505
7	300	45	2,100	$ 15.00	$ 3.16	$ 5.75	$ 27.87	$ 37.12	$ 128,637	$ 10.75	$ 3.52	$ 5.00	$ 29.64	$ 35.39	$ 124,299
10	200	32	2,000	$ 15.00	$ 3.16	$ 5.75	$ 37.35	$ 46.60	$ 108,288	$ 10.75	$ 3.52	$ 5.00	$ 40.20	$ 45.95	$ 108,072
15	100	10	1,500	$ 15.00	$ 3.16	$ 5.75	$ 53.15	$ 62.40	$ 73,770	$ 10.75	$ 3.52	$ 5.00	$ 57.80	$ 63.55	$ 75,570
20	50	4	1,000	$ 15.00	$ 3.16	$ 5.75	$ 68.95	$ 78.20	$ 46,476	$ 10.75	$ 5.03	$ 5.00	$105.60	$111.35	$ 66,534
30	25	1	750	$ 15.00	$ 3.16	$ 5.75	$100.55	$109.80	$ 32,829	$ 10.75	$ 5.03	$ 5.00	$155.90	$161.65	$ 48,426
Total	1,000	150	8,675						$ 492,306						$ 492,783

B. EXAMPLE OF LIFELINE RATES USING MINIMUM BILL AND CONSUMPTION CHARGE TARIFF DESIGN
COMPARISON OF UNIFORM CONSUMPTION RATE AND INCLINING RATE USING 5,000 GALLONS PER MONTH MINIMUM CONSUMPTION

Customer Base				Uniform Lifeline Rates for Eligible Customers						Inclining Block Lifeline Rates for Eligible Customers					
Monthly Consumption (1,000 Gal.)	Number of Bills	No. of Low Income Eligible Bills	Total Consumption (1,000 Gal.)	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Lifeline Minimum Bill	Lifeline Monthly Charge	Normal Monthly Charge	Total Annual Revenues	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Lifeline Minimum Bill	Lifeline Monthly Charge	Normal Monthly Charge	Total Annual Revenues
1	25	5	25	$ 29.10		$ 10.02	$ 10.02	$ 29.10	$ 7,585	$ 28.00		$ 9.77	$ 9.77	$ 28.00	$ 7,306
3	100	18	300	$ 29.10		$ 10.02	$ 10.02	$ 29.10	$ 30,799	$ 28.00		$ 9.77	$ 9.77	$ 28.00	$ 29,662
5	200	35	1,000	$ 29.10		$ 10.02	$ 10.02	$ 29.10	$ 61,826	$ 28.00		$ 9.77	$ 9.77	$ 28.00	$ 59,543
7	300	45	2,100	$ 29.10	$ 3.72	$ 10.02	$ 17.46	$ 36.54	$ 121,241	$ 28.00	$ 3.38	$ 9.77	$ 16.53	$ 34.76	$ 115,292
10	200	32	2,000	$ 29.10	$ 3.72	$ 10.02	$ 28.62	$ 47.70	$ 107,153	$ 28.00	$ 3.38	$ 9.77	$ 26.67	$ 44.90	$ 100,760
15	100	10	1,500	$ 29.10	$ 3.72	$ 10.02	$ 47.22	$ 66.30	$ 77,270	$ 28.00	$ 3.38	$ 9.77	$ 43.57	$ 61.80	$ 71,972
20	50	4	1,000	$ 29.10	$ 3.72	$ 10.02	$ 65.82	$ 84.90	$ 50,024	$ 28.00	$ 5.07	$ 9.77	$ 85.82	$104.05	$ 61,555
30	25	1	750	$ 29.10	$ 3.72	$ 10.02	$103.02	$122.10	$ 36,401	$ 28.00	$ 5.07	$ 9.77	$136.52	$154.75	$ 46,206
Total	1,000	150	8,675						$ 492,300						$ 492,297

TABLE 4: RATEMAKING TABLES - LIFELINE RATES EXAMPLE, ALL CUSTOMERS ELIGIBLE, IN PERCENT OF MHI

A. EXAMPLE OF LIFELINE RATES USING SERVICE CHARGE AND CONSUMPTION CHARGE TARIFF DESIGN
COMPARISON OF UNIFORM CONSUMPTION RATE AND INCLINING BLOCK RATE

Customer Base				Modified Cost of Service Rates				Uniform Lifeline Rates				Inclining Block Lifeline Rates			
Number of Bills	Median HH Income (Median System)	HH Water Cost ($/Yr.)	% of MHI	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Bill as % of MHI	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Bill as % of MHI	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Bill as % of MHI
25	$ 38,713	$ 197	0.5%	$ 15.00	$ 3.00	$ 18.00	0.6%	$ 6.33	$ 4.00	$ 10.33	0.3%	$ 5.48	$ 2.00	$ 7.48	0.2%
100	$ 38,713	$ 197	0.5%	$ 15.00	$ 3.00	$ 24.00	0.7%	$ 6.33	$ 4.00	$ 18.33	0.6%	$ 5.48	$ 2.00	$ 11.48	0.4%
200	$ 38,713	$ 197	0.5%	$ 15.00	$ 3.00	$ 30.00	0.9%	$ 6.33	$ 4.00	$ 26.33	0.8%	$ 5.48	$ 2.00	$ 15.48	0.5%
300	$ 38,713	$ 197	0.5%	$ 15.00	$ 3.00	$ 36.00	1.1%	$ 6.33	$ 4.00	$ 34.33	1.1%	$ 5.48	$ 4.00	$ 33.48	1.0%
200	$ 38,713	$ 197	0.5%	$ 15.00	$ 3.00	$ 45.00	1.4%	$ 6.33	$ 4.00	$ 46.33	1.4%	$ 5.48	$ 4.00	$ 45.48	1.4%
100	$ 38,713	$ 197	0.5%	$ 15.00	$ 3.00	$ 60.00	1.9%	$ 6.33	$ 4.00	$ 66.33	2.1%	$ 5.48	$ 4.00	$ 65.48	2.0%
50	$ 38,713	$ 197	0.5%	$ 15.00	$ 3.00	$ 75.00	2.3%	$ 6.33	$ 4.00	$ 86.33	2.7%	$ 5.48	$ 6.00	$ 125.48	3.9%
25	$ 38,713	$ 197	0.5%	$ 15.00	$ 3.00	$ 105.00	3.3%	$ 6.33	$ 4.00	$ 126.33	3.9%	$ 5.48	$ 6.00	$ 185.48	5.7%
1,000	Monthly Bill =	$ 16													

B. EXAMPLE OF LIFELINE RATES USING MINIMUM BILL AND CONSUMPTION CHARGE TARIFF DESIGN
COMPARISON OF UNIFORM CONSUMPTION RATE AND INCLINING RATE USING 5,000 GALLONS PER MONTH MINIMUM CONSUMPTION

Customer Base				Modified Cost of Service Rates				Uniform Lifeline Rates				Inclining Block Lifeline Rates			
Number of Bills	Median HH Income (Median System)	HH Water Cost ($/Yr.)	% of MHI	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Bill as % of MHI	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Bill as % of MHI	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Monthly Charge per Bill	Total Bill as % of MHI
25	$ 38,713	$ 197	0.5%	$ 29.10	NA	$ 29.10	0.9%	$ 21.00	NA	$ 21.00	0.7%	$ 17.72	NA	$ 17.72	0.5%
100	$ 38,713	$ 197	0.5%	$ 29.10	NA	$ 29.10	0.9%	$ 21.00	NA	$ 21.00	0.7%	$ 17.72	NA	$ 17.72	0.5%
200	$ 38,713	$ 197	0.5%	$ 29.10	NA	$ 29.10	0.9%	$ 21.00	NA	$ 21.00	0.7%	$ 17.72	NA	$ 17.72	0.5%
300	$ 38,713	$ 197	0.5%	$ 29.10	$ 3.00	$ 35.10	1.1%	$ 21.00	$ 5.04	$ 31.08	1.0%	$ 17.72	$ 5.00	$ 27.72	0.9%
200	$ 38,713	$ 197	0.5%	$ 29.10	$ 3.00	$ 44.10	1.4%	$ 21.00	$ 5.04	$ 46.20	1.4%	$ 17.72	$ 5.00	$ 42.72	1.3%
100	$ 38,713	$ 197	0.5%	$ 29.10	$ 3.00	$ 59.10	1.8%	$ 21.00	$ 5.04	$ 71.40	2.2%	$ 17.72	$ 5.00	$ 67.72	2.1%
50	$ 38,713	$ 197	0.5%	$ 29.10	$ 3.00	$ 74.10	2.3%	$ 21.00	$ 5.04	$ 96.60	3.0%	$ 17.72	$ 7.50	$ 130.22	4.0%
25	$ 38,713	$ 197	0.5%	$ 29.10	$ 3.00	$ 104.10	3.2%	$ 21.00	$ 5.04	$ 147.00	4.6%	$ 17.72	$ 7.50	$ 205.22	6.4%
1,000	Monthly Bill =	$ 16													

TABLE 5: RATEMAKING TABLES - AFFORDABILITY RATES EXAMPLE, LIFELINE FOR LOW-INCOME CUSTOMERS ONLY, IN PERCENT OF MHI

A. EXAMPLE OF LIFELINE RATES USING SERVICE CHARGE AND CONSUMPTION CHARGE TARIFF DESIGN
COMPARISON OF UNIFORM CONSUMPTION RATE AND INCLINING BLOCK RATE

Customer Base							Uniform Lifeline Rates for Eligible Customers							Inclining Block Lifeline Rates for Eligible Customers						
Total Bills	Median HH Income (Median System)	No. of Low Income Eligible Bills	Median HH Income (10th %ile System)	HH Water Cost ($/Yr.)	% of MHI (Median System)	% of MHI (10th %ile System)	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Lifeline Service Charge	Lifeline Monthly Charge	Normal Monthly Charge	Bill as % of MHI Lifeline	Bill as % of MHI Normal	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Lifeline Service Charge	Lifeline Monthly Charge	Normal Monthly Charge	Bill as % of MHI Lifeline	Bill as % of MHI Normal
25	$ 38,713	5	$ 27,876	$ 197	0.5%	0.7%	$ 15.00	$ 3.16	$ 5.75	$ 8.91	$ 18.16	0.4%	0.6%	$ 10.75	$ 2.01	$ 5.00	$ 7.01	$ 12.76	0.3%	0.4%
100	$ 38,713	18	$ 27,876	$ 197	0.5%	0.7%	$ 15.00	$ 3.16	$ 5.75	$ 15.23	$ 24.48	0.7%	0.8%	$ 10.75	$ 2.01	$ 5.00	$ 11.03	$ 16.78	0.5%	0.5%
200	$ 38,713	35	$ 27,876	$ 197	0.5%	0.7%	$ 15.00	$ 3.16	$ 5.75	$ 21.55	$ 30.80	0.9%	1.0%	$ 10.75	$ 2.01	$ 5.00	$ 15.05	$ 20.80	0.6%	0.6%
300	$ 38,713	45	$ 27,876	$ 197	0.5%	0.7%	$ 15.00	$ 3.16	$ 5.75	$ 27.87	$ 37.12	1.2%	1.2%	$ 10.75	$ 3.52	$ 5.00	$ 29.64	$ 35.39	1.3%	1.1%
200	$ 38,713	32	$ 27,876	$ 197	0.5%	0.7%	$ 15.00	$ 3.16	$ 5.75	$ 37.35	$ 46.60	1.6%	1.4%	$ 10.75	$ 3.52	$ 5.00	$ 40.20	$ 45.95	1.7%	1.4%
100	$ 38,713	10	$ 27,876	$ 197	0.5%	0.7%	$ 15.00	$ 3.16	$ 5.75	$ 53.15	$ 62.40	2.3%	1.9%	$ 10.75	$ 3.52	$ 5.00	$ 57.80	$ 63.55	2.5%	2.0%
50	$ 38,713	4	$ 27,876	$ 197	0.5%	0.7%	$ 15.00	$ 3.16	$ 5.75	$ 68.95	$ 78.20	3.0%	2.4%	$ 10.75	$ 5.03	$ 5.00	$ 105.60	$ 111.35	4.5%	3.5%
25	$ 38,713	1	$ 27,876	$ 197	0.5%	0.7%	$ 15.00	$ 3.16	$ 5.75	$ 100.55	$ 109.80	4.3%	3.4%	$ 10.75	$ 5.03	$ 5.00	$ 155.90	$ 161.65	6.7%	5.0%
1,000		150	Monthly Bill =	$ 16																

B. EXAMPLE OF LIFELINE RATES USING MINIMUM BILL AND CONSUMPTION CHARGE TARIFF DESIGN
COMPARISON OF UNIFORM CONSUMPTION RATE AND INCLINING RATE USING 5,000 GALLONS PER MONTH MINIMUM CONSUMPTION

Customer Base							Uniform Lifeline Rates for Eligible Customers							Inclining Block Lifeline Rates for Eligible Customers						
Total Bills	Median HH Income (Median System)	No. of Low Income Eligible Bills	Median HH Income (10th %ile System)	HH Water Cost ($/Yr.)	% of MHI (Median System)	% of MHI (10th %ile System)	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Lifeline Service Charge	Lifeline Monthly Charge	Normal Monthly Charge	Bill as % of MHI Lifeline	Bill as % of MHI Normal	Monthly Service Charge	Consumpt. Charge (1,000 Gal.)	Lifeline Service Charge	Lifeline Monthly Charge	Normal Monthly Charge	Bill as % of MHI Lifeline	Bill as % of MHI Normal
25	$ 38,713	5	$ 27,876	$ 197	0.5%	0.7%	$ 29.10	$ -	$ 10.02	$ 10.02	$ 29.10	0.4%	0.9%	$ 28.00	$ -	$ 9.77	$ 9.77	$ 28.00	0.4%	0.9%
100	$ 38,713	18	$ 27,876	$ 197	0.5%	0.7%	$ 29.10	$ -	$ 10.02	$ 10.02	$ 29.10	0.4%	0.9%	$ 28.00	$ -	$ 9.77	$ 9.77	$ 28.00	0.4%	0.9%
200	$ 38,713	35	$ 27,876	$ 197	0.5%	0.7%	$ 29.10	$ -	$ 10.02	$ 10.02	$ 29.10	0.4%	0.9%	$ 28.00	$ -	$ 9.77	$ 9.77	$ 28.00	0.4%	0.9%
300	$ 38,713	45	$ 27,876	$ 197	0.5%	0.7%	$ 29.10	$ 3.72	$ 10.02	$ 17.46	$ 36.54	0.8%	1.1%	$ 28.00	$ 3.38	$ 9.77	$ 16.53	$ 34.76	0.7%	1.1%
200	$ 38,713	32	$ 27,876	$ 197	0.5%	0.7%	$ 29.10	$ 3.72	$ 10.02	$ 28.62	$ 47.70	1.2%	1.5%	$ 28.00	$ 3.38	$ 9.77	$ 26.67	$ 44.90	1.1%	1.4%
100	$ 38,713	10	$ 27,876	$ 197	0.5%	0.7%	$ 29.10	$ 3.72	$ 10.02	$ 47.22	$ 66.30	2.0%	2.1%	$ 28.00	$ 3.38	$ 9.77	$ 43.57	$ 61.80	1.9%	1.9%
50	$ 38,713	4	$ 27,876	$ 197	0.5%	0.7%	$ 29.10	$ 3.72	$ 10.02	$ 65.82	$ 84.90	2.8%	2.6%	$ 28.00	$ 5.07	$ 9.77	$ 85.82	$ 104.05	3.7%	3.2%
25	$ 38,713	1	$ 27,876	$ 197	0.5%	0.7%	$ 29.10	$ 3.72	$ 10.02	$ 103.02	$ 122.10	4.4%	3.8%	$ 28.00	$ 5.07	$ 9.77	$ 136.52	$ 154.75	5.9%	4.8%
1,000		150	Monthly Bill =	$ 16																

4.0 System-Level Strategies for Addressing Affordability Challenges

4.1 Introduction

The affordability of SDWA compliance is primarily driven by the cost of the technical solution(s) required to provide quality drinking water. Minimizing the capital and operating costs of this solution is a critical factor in establishing whether public health protection can be affordability achieved. To minimize costs and promote system sustainability, all options that achieve full regulatory compliance need to be considered prior to and during the small system variance process. These approaches include cooperation/consolidation/regionalization, decentralized treatment, and capacity optimization. In most cases, system-specific solutions are required to minimize small system regulatory compliance costs. System size, location, geography, type and level of contaminant, and current system operations must all be considered when determining the most cost-effective approach to regulatory compliance.

Clearly, strategies that reduce a system's total regulatory compliance cost will promote increased compliance and the associated public health benefits. The cost of compliance solutions can be reduced through either creative funding incentives or by innovative management, technical, and/or operating solutions. This section explores non-financial approaches that reduce the cost of small system compliance. By expanding compliance options beyond individual contaminant removal by conventional treatment, more cost-effective solutions can be identified and implemented and the need for variances reduced. This section focuses on cooperation, treatment technology, alternatives to central treatment, and system flow capacity optimization as methods of promoting affordable compliance.

4.2 Discussion

4.2.1 Cooperation

Cooperative efforts among water systems can result in technical and economic value and potentially reduce the cost of regulatory compliance. Over the years, these efforts have been referred to as "regionalization," initially meaning a physical consolidation of independent water systems and more recently including cooperative purchasing, financing, operation, or other management strategies that may or may not include the actual physical connection of one system to another. State and federal regulators use the term "restructuring" to cover the full range cooperative activities.

The Work Group believes that high priority should be given to an increase in cooperative activities of all kinds and that the terminology used should facilitate an objective evaluation of the costs and benefits of cooperative activities. To one degree or another, State and federal policy, regulations, and financial assistance programs have increasingly emphasized the benefits and need for these broadly defined "consolidation" strategies, including economies of scale for

both capital and operating costs; enhanced access to financial assistance; improved use of technology; heightened capacity for dealing with drought, pollution or other unforeseen problems; and better access to qualified planners and operators.

While the most recent round of SDWA amendments recognizes the value of such efforts in addressing drinking water affordability, federal law does not impose specific requirements for consolidation and cooperation, and the Work Group had considerable difficulty in finding broad-scale measures of progress on this point. EPA's database for Community Water Supply Systems shows that many States have decreasing numbers in their inventories of systems, but those data alone do not offer a complete and accurate measure of the remaining potential or need for cooperation within each State. For example, in Pennsylvania, which has an impressive program of financial assistance promoting cooperation, the total number of small systems increased by 14 percent between 1994 and 2001, while the number of consolidated systems increased by 72 percent so that the resulting number of standalone small systems increased by just 7 percent. Overall, the Work Group relied heavily on anecdotal information from knowledgeable sources, case studies, and examples rather than specific, objective measures of capacity development and consolidation.

EPA has provided resources and suggestions to the States for their triennial capacity-building reports to governors, stipulated in the SDWA. These include strategies for assessing the long-term viability of systems; models for improving the technical, managerial, and financial capacity of systems; use of funds to improve capacity; and informing the public of the benefits of consolidation and cooperation. States continue to do a better job in this area as evidenced by a number of State initiatives and programs, including water delivery planning in the States of Washington, Maryland, and Connecticut; the Virginia Department of Health technical assistance program, which includes independent contractor assistance for on-site operations, source water protection planning, and compliance and business plan development; the Pennsylvania program, which includes targeted funding for improving the condition of small systems; and other programs in Kentucky, South Dakota, Texas, and elsewhere.

Overall, the information reviewed indicates that many States have increased their emphasis on local capacity development and cooperative efforts, but that large numbers of small systems still act to preserve their independence, sometimes even in the face of strong economic pressures to the contrary. For example, the Virginia Department of Health's 1999 survey of 3,781 small water systems indicated that half would not be willing to consolidate, and only 22 percent said they would be interested.

The Work Group believes that new technologies, improved communications, and the increasing availability of private-sector services have created new opportunities for small systems to gain the benefits of cooperative action and still preserve management control over rates and basic policy decisions. Thus, it may be possible for EPA to further support the States in creating a variety of incentives for cooperative action. While the problems facing many small systems are common, there are significant differences that should be recognized in the creation of any new programs. Almost every small system would benefit from increased cooperation; the questions are what the possibilities of cooperation are and how government can act to stimulate cooperative action.

Drivers for Cooperation

Listed below are some of the issues that should encourage systems to cooperate.

- A variety of State and federal initiatives (both regulatory and financial) have steadily increased pressure to cooperate, including enforcement of quality standards; State water service planning programs; State requirements for reporting on technical, managerial, and financial capacity by small systems; and federal and State funding assistance for consolidation and cooperation programs.

- The high cost of construction and operation of treatment works, distribution system improvements, and interconnections that are needed to achieve compliance.

- The increasing technical requirements for operation, maintenance, and oversight including monitoring and laboratory work for treatment systems.

- Increasing common interests of systems within a region or watershed with regard to planning and regulatory oversight.

- Potential opportunities for performance of difficult new operating and customer service functions by larger nearby utilities and/or the private sector.

- Regional problems with drought, pollution, or other restrictions on water supply.

- Increasing public dissatisfaction with the quality of drinking water as indicated by the purchase of individual solutions such as POU devices and bottled water.

Barriers to Cooperation

While there are numerous economic and operating advantages of cooperation, there are also many barriers that discourage the implementation of cooperative activities. These barriers include:

- Determination to maintain independent control of all utility functions, even when costs are significantly higher.

- Lack of technical experience or knowledge about planning, technology, operations, and maintenance.

- Geographic barriers, including long distances between systems or separation by mountains, rivers, or transportation routes.

- Public or institutional concern about land use factors, including issues related to expanding population and economic development.

- Lack of funding for planning and capital investment, or retention of needed expertise that is necessary to implement any solution, particularly the least costly.

- Absence of an institutional vehicle for local cooperation.

- Lack of business incentives, particularly in small non-profits, to protect and improve water system assets.

- Divergent philosophies of integrating systems, such as different levels of service, finished water qualities, system condition, debt service, rate levels and structure, and general financial viability.

- Lack of leadership for championing cooperation at the State or local level.

Overcoming Barriers

Past cooperative efforts, including physical consolidation of small, non-viable neighboring systems, have been mandated under some State statutes, supported with incentives for some PUC-regulated utilities, and offered enforcement delay incentives. Many have thought that with sufficient grants, an atmosphere of crisis, and incentives, consolidation would occur broadly all around the country. In most areas, however, this appears not to have been the case. Cooperation has occurred, but needs to be continued and expanded to achieve a high potential for improvement and compliance.

Members of the Work Group heard strong evidence from practitioners in the field that the historic institutional determination to preserve local independence has been the single most serious barrier to cooperation. The solutions identified below are designed to overcome this and other barriers. In general, the skillful use of assistance when combined with new State or regional level initiatives can achieve a significantly higher level of cooperative effort in a variety of areas. We recognize that there is no single program or effort that will overcome the small system economic challenge. In some areas, fully competent systems exist alongside systems that are financially and technically challenged, and the Work Group sees these situations as being the most fruitful candidates for cooperative solutions.

The Work Group strongly supports the reorientation of the DWSRF and related grant programs to assist those systems with inadequate collective rate repayment capacity with implementation of cooperative solutions that improve the systems' long-term viability. EPA can also foster greater cooperation and consolidation by working to create better measures of progress in this area and modifying the triennial reporting requirements to include these measures. This may be accomplished by continuing improvements to the EPA Community Water Supply inventory and by working with the States to find additional reliable indicators of improvement through consolidation and cooperation.

Recommendations to Enhance Cooperation

On balance, there has been a steady increase in cooperative efforts ranging from consolidation to focused shared services. The following recommendations (followed by detailed discussions) are offered in hopes of accelerating existing programs and creating the necessary impetus in areas where cooperation and consolidation have been viewed with suspicion.

- New and expanded State leadership is essential to promote cooperation among small systems. Cooperative efforts designed for an area or region are essential if the cost of compliance is to be reduced. These efforts should be funded through new appropriations or through re-allocation of a portion of DWSRF funds that are currently being applied to individual system projects. State-managed cooperative efforts should include:

    - Providing managerial, technical, and planning assistance for small systems, including expanded use of the private sector and large central utilities that can provide these services.

    - Public outreach to small systems to provide support and information on the value of cooperative and consolidation efforts.

    - Conducting focused outreach programs to regional groups directly or in conjunction with others, and allowing cooperation expenditures by these groups to be considered in federal and State financial assistance programs.

    - Continuing and improving methods of recordkeeping and reporting progress in capacity-building programs (consistent with SDWA capacity development provisions) and reporting progress in achieving small system cooperation and consolidation to EPA and the NDWAC. EPA and the States should use this information to develop and maintain an effective small system cooperation database that can be used to promote cooperation.

    - Offering meaningful incentives for cooperative efforts and limiting financial and technical support for individual system compliance solutions to only those small systems that have assessed cooperative options and found them to be infeasible or not cost-effective.

    - Offering assistance to community groups, system operators, and owners in the development of governance, advisory, or other participatory vehicles to ensure a continued role for these stakeholders when cooperative solutions are implemented.[28]

[28] See Appendix 1 for minority views.

These recommendations are supported by the following conclusions:

Strengthened State Leadership

Given the wide diversity of small systems and their geographic, economic and social circumstances, it is clear that there is no one-size-fits-all solution to small system affordability. Where consolidation and cooperation have been successfully used, however, it is clear that one element is generally present. Leadership from individuals or institutions has been a key factor in cooperation successes, and the Work Group believes that the States are in the best position to generate the leadership that will promote safe and affordable water over the long term. States should give higher priority for assistance to cooperative efforts of all kinds and implement the following programs.

- Increase the proportion of resources currently allocated to States from federal sources to assist small utilities in cooperative efforts. State funding agencies should also link future assistance to success in taking advantage of cost-savings opportunities from operating water and wastewater systems in conjunction with one another.

- Enhance public education, with a strong emphasis on the value of cooperative efforts.

- Permit the creation of new small systems only if there is a clear demonstration that future financial, managerial, and technical capacity will be available at an affordable rate.

- Ensure that construction of any small systems anticipates future opportunities for consolidation and coordination.

- Create direct and appropriate public linkages between enforcement and cooperative action, addressing compliance problems of small systems with enforcement options that maximize cooperation and consolidation in order to address long-term as well as short-term problems.

- Initiate planning programs that provide an opportunity to take full advantage of economies of scale that can be achieved with water service cooperation and consolidation in critical regions or statewide.

New State Activities

New efforts are needed in the initiation of cooperative activities including preliminary planning and, financial and institutional strategies. States should also consider two new programs involving State or delegated activities, under which the services of independent private contractors, non-profit entities, and existing water utilities are made available to local systems for project development and other tasks identified below. In general, such services should be under the guidance of stakeholder groups at statewide, regional, and local levels.

Area-wide Contractors

Qualified non-profit entities or private companies, including existing investor-owned water utilities, with expertise in such fields as engineering, analysis, and operations should be mobilized to provide service to groups of small utilities. Incentives are needed to reduce start-up risks for such contractors, and service-providers should be selected in a competitive process that is administered by the State or other appropriate unit of government. When private contractors are used to achieve efficiencies and obtain expertise, these services must be appropriately controlled or regulated (through contracts and other legal methods) to protect consumer interests.

Cooperating Entities

A variety of techniques should be used to provide services to small utilities. They include not only direct service outreach by government agencies but also assistance to existing larger utilities (public and private), which in turn service smaller systems. In order to overcome barriers to implementing such programs, service contracts can provide for shared liabilities in the conduct of the particular function. If necessary, new legislation should be sought to limit liability of a capable service-providing entity so that the liability is not transferred except in the case of negligence.

Local Roles

Many small communities place a high value on sustaining a measure of local independence and on entrusting their own citizens with important decision-making authority. Thus, the prospects of dissolving a local water board or authority can be met with solid resistance, even in instances where more affordable rates would be achievable with consolidation. Creating meaningful future roles for existing owners and individuals with a stake in each water system, then, is perhaps the essential element in overcoming the negative perceptions of system takeover. These roles may be required for a short period of time or function indefinitely to ensure that future water rates and local service conditions continue to reflect the needs of the community. These activities can be conducted through an informal association, a more formal association similar to a homeowners' association, a joint exercise of powers for governmental units, or through a cooperating agreement among participants.

Types of Services

- *Planning*: development of plans and a cost-sharing basis for any joint activities ranging from physical consolidation to sharing of common services.

- *Monitoring and Analysis*: sample collection, laboratory analysis, and regulatory representation in communication.

- *Facilities*: design and construction of needed improvements that could range from treatment additions to regional consolidations.

- *Operations*: provide master State (or regional) competitively selected contractor who would offer identified services including treatment operations (circuit rider), installation and operation of water treatment facilities, Supervisory Control and Data Acquisition systems , and emergency response.

- *Administration*: create a central private or public service for meter reading, billing, and consumer advice including water conservation.

Allocation of Assistance

Assistance would be allocated to utilities with affordability issues, giving priority to cooperative solutions, with analysis based on a study of overall operations as well as each utility function. If initial planning shows continuing independent treatment and/or operations to be the most cost-effective, funding should be provided.

Cooperation, which achieves optimal long-term investment value, may result in increased operation and maintenance costs. In some situations the locally borne operating costs (particularly for energy) may deter agreement on an integrated cooperative solution. In these situations, short-term financial relief may be required through individual customer subsidies or by spreading cost across the consolidated systems.

If a way can be found to direct the value of DWSRF subsidies to the benefit of individual low-income customers, particularly in cases that justify cooperative action, the combined financial strength of utilities could be enhanced. The allocation would be directed through the utility to individual users within the system who cannot pay a fully allocated share. The amount of the support would be determined by the "affordability gap" and would not result in a cost reduction for individual users that could afford their full allocated share. (See section 3 on financial assistance strategies.)

4.2.2 National-Based Technology Solutions

The technology to treat and deliver water that meets the drinking water standards is known and available. Continuing research may lower the cost of centralized treatment and simplify the technology, but current technology is in place to deal with all known common contaminants. With newer technology there continues to be a need for training and additional operations personnel. Costs for the technology are generally known and are site specific, although costs will probably come down with widespread adoption and development. Residuals disposal may be a problem for some of the technologies, and these costs must be considered as part of an overall cost assessment.

Technology is available for every common drinking water contaminant regulated to date. Groups of contaminants and the associated treatment technology are listed below.

- ***Microbiological Contaminants*:** Appropriate technologies exist to reduce and inactivate every regulated microbiological contaminant encountered to date. Using chlorine as a disinfectant continues to be very effective, but may increase disinfection byproducts. Many utilities are switching to other disinfectants to deal with this issue.

- **Inorganic Contaminants:** Technology exists to reduce the commonly encountered inorganic contaminants, but treatment of some of these may produce problem residuals that require special disposal technology. This would apply to radioactive-chemicals such as radium.

- **Organic Contaminants:** Technology exists that can reduce organic contamination, but there may be secondary issues depending upon the technology selected. For example, granular activated carbon (GAC) must be replaced and/or regenerated at some frequency. Regeneration is by heat and this may pose some air quality issues.

Barriers

Some barriers to implementing compliance technology are listed below.

- **Capital Costs:** Capital costs for all of the technologies are known and will vary from site to site because of individual site conditions, land costs, residuals disposal, local zoning, etc. For example, pack tower aeration (PTA) is appropriate technology for many volatile organic compounds, but installing PTA in a residential neighborhood may require noise abatement and carbon scrubbers for the off-gas. These costs cannot be predicted on a general basis and must be done site by site.

- **Operation and Maintenance Costs**: Operation and maintenance (O&M) costs are known for all of the technologies and will vary from site to site because of the differences in the equipment. Additional costs will be incurred as the technology becomes more complicated and more operator training needs are identified. Residuals disposal may be considered to be an O&M cost, and if the residual is deemed "hazardous," as with some of the arsenic treatment options, the disposal cost can escalate rapidly.

- **New Technology Development:** The development of new technologies may be delayed because of the cost for development and the length of time it takes to obtain appropriate regulatory approval and acceptance. There may be more need for an expanded National Certification Program to accelerate the approval process for new technologies.

- **Regulatory:** The regulatory procedures for currently available technology are in place, but as more and more complicated treatment is employed more training and information will have to be provided to the States. For example, more membrane technology is being installed for filtration, but most State regulatory agencies have not had a great deal of experience inspecting these units and training is needed.

- **Business Strategies:** As more complicated technology is employed, there will be more opportunities for "third party" operations and technical support. New technology for new contaminants will lower costs and provide simpler solutions in some cases. This will almost surely occur with development of new treatment technology for arsenic.

Overcoming Barriers

The two major barriers are money and training to operate the newer technologies. There are also residual disposal questions that need to be answered, but these translate into additional costs. New technology testing and approval procedures can be streamlined. Additional work will have to be done to identify the training needs of operators and regulators. Third party operations may be appropriate to improve the economies of scale for more complex technologies.

Super BAT

One concept that has been suggested for small systems is the development of a "Super Best Available Technology" (Super BAT). This proposal suggests a monitoring program and treatment train, which can be designed and installed to treat for every MCL currently in the regulations and for those that are likely to be promulgated in the future. This treatment would only be for small systems, population 10,000 or less, and would differ for groundwater and surface water. At a use rate of 100 gallons per capita per day, this will equate to a capacity of 1 million gallons per day. It is assumed that a new unit would be built, rather than retrofit an existing unit.

The objective is to create an alternative compliance track for small systems, which are confronted with a current compliance gap, and anticipate the possibility of future additional treatment requirements. Recent technology improvements in the area of membrane separation and disinfection show potential for small size units that could be made available through various contractual arrangements. The treatment steps would vary depending upon the identified contaminants and projected future regulations.

Groundwater Treatment

A typical treatment train might include all or some of the following units depending upon the types of contaminants present:

- Pre-oxidation with chlorine;
- PTA to reduce radon and other volatile organic chemicals;
- Coagulant addition (Ferric or another chemical);
- Membrane filtration to reduce metals (arsenic) and remove microbial contaminants;
- Ozone or ultraviolet light for additional disinfection;
- Filtration with GAC to further reduce organic contaminants including disinfection by-products;

- Final disinfection with chloramines; and
- If nitrate is a problem ion exchange may also be included in the process.

Surface Water Treatment

A typical treatment train for rivers, lakes, springs, etc. might include all or some of the following units depending upon the contaminants present or suspected and the quality of the source:

- Continuous source monitoring for organic indicators;
- Pre-oxidation with chlorine;
- Coagulant addition (Ferric or other chemical);
- Sedimentation for reduction of solids;
- Membrane filtration for reduction of metals, turbidity, and microbial contaminants;
- Ozone or ultraviolet light;
- Filtration with GAC to further reduce organic contaminants including disinfection byproducts; and
- Final disinfection with chloramines.

Other site-specific considerations are land availability, treatment residuals disposal (sludge from membrane filtration, etc.), local zoning requirements, pumping costs, storage needs, permitting requirements, etc. In each case, it is assumed that the best available source will be used.

Recommendation Regarding National-Based Technology Solutions

- Recent scientific and technical developments have increased the potential for "umbrella" compliance technologies, such as membranes. EPA should establish a Work Group to review the technical and policy feasibility of allowing a "Super BAT" approach to provide affordable, long-term compliance, including the consideration of appropriate incentives regarding future compliance.

It may be possible to design and implement a treatment unit, as noted above, that will anticipate future contaminants and standards and will allow the utility to make only one installation. If cost was not a constraint, this can be done in every situation. However, the affordability issue requires that additional work be done to identify costs and the appropriate technologies without compromising public health protection.

4.2.3 Alternatives to Central Treatment

Various alternatives to centralized treatment are available, but barriers to these alternatives exist. All alternatives are capable of being implemented and are in place in various water systems. The alternatives vary from providing individual treatment units in each home to providing an entirely new source or sources of water. Costs for implementation are site specific and may require significant expenditure of new resources and operations personnel.

Types of Alternatives to Central Treatment

POU Treatment

This technology is applied at the "Point-of-Use" in a location such as the kitchen sink. It is designed to treat only a portion of the flow in the entire household, so only a portion of the water delivered to the household meets the drinking water standards. As such, POU units are only appropriate for management of certain contaminants and cannot be relied upon where microbial infection from bathing, inhalation, or dermal exposure is a major concern. In addition, POU units must be small enough to fit under the sink or in some equally confined space. Issues with POU units include education of the members of the house to drink water only from the treated tap (or taps) and to use this water for cooking and making other beverages. Responsibility for maintaining the unit in proper working order lies with the water utility, and use of the units must include a management and inspection program to ensure proper operation. Typical POU units are ion or resin exchange for arsenic reduction, GAC for reduction of minor organic chemical contamination, and reverse osmosis for reduction of dissolved solids or some specific ions such as arsenic.

POE Treatment

This technology is designed to treat all of the water being delivered to the residence or residences such as multiple houses, condominiums, town houses, apartments, etc. The unit is sized to treat all of the water and has the advantage that all of the taps in the residence are considered potable. Treatment units are typically located in a garage or other buildings outside the actual residence. Units are similar to POU units only larger. As with the use of POU units, the use of POE technologies must provide for proper maintenance and operation by the water utility.

Bottled Water

Bottled water delivered by the water system is appropriate, but is only currently allowed for short-term acute drinking water problems such as nitrate or bacteria. The Work Group agreed that the alternative of bottled water was not the first choice to be considered by a utility, and its use for long-term problems should be allowed in very small systems with limited resources and without reasonable options for cooperation or consolidation. If allowed, the need for public education is essential to ensure that the occupants drink only bottled water and use it for cooking and preparing beverages, and that bottled water cannot be relied upon where microbial infection is a risk, or where a health risk from bathing, inhalation, or dermal exposure is a major concern. The bottled water must comply with all appropriate drinking water standards and be administered (and delivered) by the utility. The use of bottled water is not an option if inhalation or dermal exposure to the applicable contaminant poses a health risk.

Dual Water System

Provide a dual water system wherein only a small proportion of the total amount of water is treated and provided to each home for domestic purposes. This may be appropriate in areas

where there is a high amount of irrigation water use. However, costs could be prohibitive to provide a dual system.

Source Replacement

This approach may be possible to avoid providing treatment and is one of the options generally considered in all contamination issues. In general terms, source replacement might mean abandoning a contaminated well and drilling a new well in a more protected area. This would also require installation of a new transmission line and might require additional pumping depending on the distance to the new source.

Barriers to Implementation

Legislative

At the federal level, POU and POE units are allowed (except for microbial contaminants). Based on EPA's informal assessment of the SDWA, the Act is "silent" on whether bottled water is allowed as a variance technology or for other, normal compliance efforts.

Regulatory

If allowed, POU and POE units must be regulated by the States and some form of approved maintenance procedure must be developed. Generally, POU units must be replaced at some frequency by "qualified" personnel; POE units must be "serviced" at some similar frequency by "qualified" personnel. If regulatory actions allow bottled water as a variance technology or other compliance option, then the bottled water should be delivered to the house or available at some convenient central pickup location. In addition, quality control procedures must be employed by the primacy agency and the utility to ensure that these technologies are used correctly.

Cost

These technologies may be cost-effective vs. central treatment based upon an individual system analysis taking into consideration some of the following factors:

- Amount of water to be treated. If the system has a large irrigation or other non-potable demand, it may be cheaper to treat only the drinking water.

- Number of contaminants. A single problem contaminant may be more cost-effective vs. multiple contaminants. For example, it may be cost-effective for only arsenic but not a problem that involves arsenic, nitrate, and an organic chemical problem.

- Size of the system. For example, if a POU or POE unit must be serviced once a month and that servicing plus travel time takes 1 hour, in 1 day a service person can visit 8 units or 40 per week or 160 per month. Given other needs such as other maintenance, stock procurement, vacation time, sick leave, etc., the labor needs will

probably double. For a community with 160 or fewer residences, two people would be required.

- Number of systems. Dual water systems are expensive since a second complete water distribution system is required and extensive cross connection control is needed.

- Need for a new source. Source replacement will require a new well or other source and appropriate pumping and transmission facilities. New storage may also be desirable to allow for more efficient pumping schedules. If more than one source is contaminated, planning will have to include the possibility that more than one source will have to be replaced.

Practicality

- POU: This option cannot be used for contaminants that are acutely hazardous (e.g., acute toxins or infectious microorganisms) or that may affect the user through dermal exposure or inhalation. These units do not treat the water that may be ingested by the traveling public unless they are installed in every public facility and thus are not appropriate for acute contaminants associated with acute effects.

- POE: This option can be used for contaminants that are acutely hazardous or that may affect the user by dermal or inhalation exposure. There may be an issue with residuals disposal depending on the type of treatment employed. The traveling public issue is the same as with POE units.

- Bottled Water: This may be practical in smaller communities, but is not currently allowed. If the regulations are changed to allow the use of bottled water, guidance will have to be provided to ensure the quality of the water and to provide for use by all consumers. It is envisioned that bottled water will be appropriate only in limited situations and under strict controls.

- With these technologies there may be an aversion by the consumers to having "someone" come into their homes to service the units. This issue has been seen in some communities that are attempting to use POU technologies. Methods to deal with these problems must be developed prior to deployment of the technology.

Overcoming Barriers

- **POU and POE:** Determine and develop State and local programs to provide approval and maintenance procedures.

- **Bottled Water:** Provide legislation and/or regulation at the federal and State levels to allow the use of bottled water.

Recommendation Regarding Alternatives to Central Treatment

- Consider regulatory changes to allow the use of system-delivered bottled water in appropriate cases, either as a variance technology or to achieve compliance (with primacy agency approval) for non-microbial, non-inhalation, and non-dermal compliance situations. The use of bottled water should be considered only when it meets applicable standards, is accompanied by a public education program, and the system guarantees quality assurance.

  The Work Group recognized that many States would be reluctant to use this option but concluded that careful scrutiny and case-by-case evaluations of this option were appropriate. The Work Group's recommendation is meant to allow for the use of bottled water for "exceptions" (i.e., for hardship cases) and not to promote the use of bottled water as a preferred means of long-term compliance for significant numbers of systems.

4.2.4 System Capacity Optimization

To achieve small system compliance with the SDWA, compliance affordability must be addressed at many different levels. Whether a cooperative and/or a treatment solution is the preferred option selected for compliance, the cost of this option may be reduced through implementation of individual system-based technological enhancements. These system-based improvements are primarily focused on reducing a small system's required production or distribution capacity through water loss reduction, system optimization, or demand management.

Capacity Enhancements

For a small system confronted with contaminant removal to comply with the SDWA, the cost of regulatory compliance can be directly related to the capacity (in gallons per minute or gpm) of the required treatment facilities. Therefore, potential cost-effective and publicly acceptable methods to reduce capacity must be examined. In general, these capacity issues are divided between supply and demand-side management.

Supply-Side Management

Water Loss

Many small systems have deteriorating buried infrastructure due to improperly designed or constructed systems and/or inadequate funding to maintain the system. Unfortunately, actual levels of small system water loss are difficult to quantify due to poor records and/or lack of metering. While many publications recognize the small system water loss issue, the data from recent surveys [USEPA (1997), USEPA (2002), SIU (2000)] show the average values of small system unaccounted-for water to be at an acceptable level of less than 15 percent. These findings are suspect given the limited source water and customer metering present in many small systems. Therefore, better data collection and understanding of small systems are necessary to confirm the presence and quantify the magnitude of the small system water loss "problem."

Allowing high levels of water loss and/or not quantifying leakage has historically made economic sense for small systems. Since small systems typically have inexpensive ground water sources with minimal treatment, the incremental cost to produce water is typically less than the cost of repairing leaks. However, with future regulatory compliance driving the cost of drinking water substantially higher through significant capital investment and operating expenses, these economic conclusions need to be re-evaluated. It is especially important that the financial impact of all future regulations that drive treatment and/or cooperative solutions be considered in the evaluation.

System Optimization

Because of the evolution and size of many small water systems, their distribution systems and water use patterns are not always designed to minimize required production capacity. Historically, this is due to the relatively low incremental costs of minimally treated groundwater compared to the construction of flow equalization facilities (distribution storage). This design approach, combined with high peaking factors (maximum hour/maximum day) associated with many small systems, can result in a high treatment capacity requirement per customer. To avoid the high SDWA compliance costs associated with this small system characteristic, optimization of production and distribution facilities is required. This analysis, which includes evaluating features such as water storage, system interconnections, and standby power facilities, is unique for each system and involves determining the least cost combination of plant capacity and distribution system improvements.

Demand-Side Management

Metering

If a small system is constructed without residential water meters, residential water rates are typically identical for all consumers and are independent of water use. This tariff structure provides no incentive for the individual consumer to control water use. The resulting water use characteristics can be high average and peak day water use compared to metered systems. Higher peak day use directly relates to increased plant capacity requirements. Higher average day use directly relates to higher O&M costs. Therefore, if a treatment facility is required for regulatory compliance, the associated per customer capital and operating costs would be higher for an unmetered system. Since system metering can reduce water use by up to 30 percent (conservation rates may also be required to achieve this level of reduction), the cost of meter installation would typically be fully supported by operating cost savings. Therefore, the avoided incremental plant capacity capital costs, achieved through metering, may require no further economic justification.

The cost and effectiveness of meter installation need to be confirmed before implementation. Older homes may require significant plumbing modifications to facilitate meter installation. Additionally, where the individual consumer does not have direct control over the metered water use (i.e., multi-family dwellings, some mobile home parks, etc.) or is not directly billed for the water used (renters), the effectiveness of metering can be limited.

Conservation Rates

Conservation rates discourage "excessive" water use by charging the public increasing unit rates as more water is consumed. These rates have been found to affect normal water usage in the home through the installation of conservation devices, as well as discretionary water use associated with lawn watering, car washing, and similar activities. However, implementing a conservation rate structure, which can effectively decrease the cost of required capital improvements associated with plant capacity, is a complicated process. It requires both public acceptance of the new pricing policy and proper economic design to shave peak demands. Meter reads must be timed to capture water used during peak demand periods. Generally, monthly billing is needed. Price elasticity must be studied to ensure that a rate structure will depress peak demand patterns. If conservation rates are successful only in controlling average water use, operating costs will be marginally reduced but cost savings associated with plant capacity reduction will not be achieved.

Recommendation Regarding System Capacity Optimization

- When examining the cost of regulatory compliance at the national or State level, system flow capacity optimization (achieved through control of water leakage, metering, rate structure, and facility design) should be considered prior to developing the cost of system treatment technologies and/or cooperative solutions

Since the majority of small systems use inexpensive groundwater sources with minimal treatment, there has been limited incentive to optimize their flow capacity requirements. However, with the significant increase in the incremental cost (capital and O&M) of treatment associated for regulatory compliance, flow capacity optimization should be implemented. Small system treatment capacity requirements can be significantly reduced by the installation of customer meters, controlling system leakage and enhancing distribution systems to minimize the impact of peak demands on production capacity. Each of the flow capacity optimization options should be introduced to the development of national compliance cost estimates. Additionally, States should consider the impact of capacity optimization on compliance affordability prior to initiating a variance process or funding compliance solutions.

4.3 Recommendations

In summary, the Work Group recommendations related to system-level strategies for addressing affordability challenges are:

- New and expanded State leadership is essential to promote cooperation among small systems. Cooperative efforts designed for an area or region are essential if the cost of compliance is to be reduced. These efforts should be funded through new appropriations or through re-allocation of a portion of DWSRF funds that are currently being applied to individual system projects. State-managed cooperative efforts should include:

- Providing managerial, technical, and planning assistance for small systems, including expanded use of the private sector and large central utilities that can provide these services;

- Public outreach to small systems to provide support and information on the value of cooperative and consolidation efforts;

- Conducting focused outreach programs to regional groups directly or in conjunction with others, and allowing cooperation expenditures by these groups to be considered in federal and State financial assistance programs;

- Continuing and improving methods of recordkeeping and reporting progress on capacity-building programs (consistent with SDWA capacity development provisions) and reporting progress in achieving small system cooperation and consolidation to EPA and the NDWAC. EPA and States should use this information to develop and maintain an effective small system cooperation database, which can be used to promote cooperation;

- Offering meaningful incentives for cooperative efforts and limiting financial and technical support for individual system compliance solutions to only those small systems that have assessed cooperative options and found them to be infeasible or not cost-effective; and

- Assistance to community groups, system operators, and owners in the development of governance, advisory, or other participatory vehicles to ensure a continued role for these stakeholders when cooperative solutions are implemented.[29]

- Consider regulatory changes to allow the use of system-provided bottled water in appropriate cases, either as a variance technology or to achieve compliance (with primacy agency approval) for non-microbial, non-inhalation, and non-dermal compliance situations. The use of bottled water should be considered only when it meets applicable standards, is accompanied by a public education program, and the system guarantees quality assurance.

- Recent scientific and technical developments have increased the potential for "umbrella" compliance technologies, such as membranes. EPA should establish a Work Group to review the technical and policy feasibility of allowing a "Super" BAT approach to provide affordable, long-term compliance, including the consideration of appropriate incentives regarding future compliance.

- When examining the cost of regulatory compliance at the national or State level, system flow capacity optimization (achieved through control of water leakage,

[29] See Appendix 1 for minority views.

metering, rate structure, and facility design) should be considered prior to developing the cost of treatment technologies and/or cooperative solutions.

5.0 Public Education

5.1 Introduction

Public education plays an important role in almost all of the recommendations of the NDWAC. Only after the public is informed on the cost and value of SDWA compliance can the proper public policy decisions be made. Educating consumers and public agencies on issues such as public health risks, affordability criteria, financial assistance, technical approaches and compliance options is necessary before a water system commits to a compliance variance. However, implementation of an effective public education program will be difficult given the challenges of accessing the public (especially small systems), communicating complex technical issues, addressing unique local concerns, and literacy/language issues.

5.2 Approach to Public Education

Justifying increased water rates for regulatory compliance, even when affordability limits are not reached, requires that the value of compliance and the associated water quality benefits be clearly and accurately communicated to the consumer. While public education has limited value when the consumer is unable to pay for utility service, it can influence the consumer's willingness to pay for regulatory compliance if funds are marginally available. Competing demands for disposable income can result in the public challenging the benefit/cost of improved drinking water quality, unless public health and aesthetic values are balanced against other expenditures. This education becomes more important when the regulatory actions do not improve the aesthetic quality of the drinking water. Therefore, to encourage regulatory compliance and public acceptance of the associated increased water rates (which may be significant), public education programs must be developed which:

- Emphasize the short- and long-term health risks and benefits (risk avoidance) of improved drinking water quality;
- Explain the options evaluated and the recommended solution to produce a water quality that achieves regulatory compliance; and
- Identify and address local concerns, cultures, and issues that affect affordability.

A requirement of the small system variance technology process is public notice and hearings. In addition, to successfully achieve regulatory compliance, it is essential that the public be educated and understand the value derived from improved water quality. However, compliance solutions, economic challenges, and social priorities will vary significantly from system to system. Therefore, public education initiatives must recognize the socio-economic issues and values that drive public opinion for individual small systems. Where the per customer cost of regulatory compliance is significant, public education and communication are essential to overcome resistance to compliance.

Unfortunately, the education derived from public hearings occurs near the end of the compliance evaluation process – often too late for effective public education and input. In addition, since in many cases the State and utility bypass the formal variance process in lieu of other compliance approaches, all formal education may be eliminated. In these cases, the only proactive public education would be the annual Consumer Confidence Report (CCR). Unfortunately, the CCR offers limited and very structured information on the very complex subject of public health protection and regulatory compliance.

Effective public education, which is structured to allow stakeholders to participate in developing and understanding solutions to improve water quality and achieve regulatory compliance, must be initiated at the earliest reasonable date. The development and implementation of these education programs needs both State and local input. For regulatory issues, the utility and State primacy agency need to evaluate when it is appropriate to initiate the public education process. The level of contaminant(s), aesthetic issues, health implications, regulatory status, and the development of compliance options all need to be considered when establishing the timing for public input. The communication plan needs to address the topics being addressed by each of the three NDWAC Affordability Work Group committees: affordability, financing options, and system-level strategies.

A national strategic public education plan should be developed to identify the resource needs and the process which most effectively addresses local small system concerns with compliance and affordability issues. While the States (and EPA) can provide the technical, health, and risk base for a particular SDWA requirement, local leadership is required to promote the solution selected to achieve compliance and the value derived from compliance. Principles of the education program could be derived from other public health and safety education programs that have been successfully implemented (vaccinations, seatbelts, etc.).

The difficulty in communicating the messages associated with water contaminants must be recognized. Public health and compliance issues can be complicated and emotional. For small systems, where the technical and communication resources are not internally available, State and/or other technical assistance personnel will be needed to initiate and maintain public dialogue. Extensive use of the media needs to be considered. The goal of the communication/education process is to engage as many interested consumers and other stakeholders as possible to create a forum with a variety of perspectives.

5.3 Recommendations

The members of the NDWAC Affordability Work Group recognized the importance of a comprehensive public education program to communicate the complex technical issues associated with the SDWA variance process. The general recommendations of the Work Group are:

- EPA should determine the scope, feasibility, and cost of implementing a national public education campaign that addresses the health risks and benefits (risk avoidance) of improved drinking water quality, and implement such a campaign, if feasible.

  The most effective process for communicating health-related and aesthetic drinking water quality issues to the public, and the cost of the process, should be identified. The program must consider the challenges in communicating technical issues, the accessibilities of the consumer (especially in small systems), and cultural (language, economic, literacy) issues. The federal government, States, public entities, and/or private contractors could be used to develop and implement this public education program. However, any national-level campaign should be adaptable to allow inclusion of regional or local issues. The proposed public education program should strive to reach a diverse target audience and encourage stakeholder feedback, especially where issues with regulatory compliance exist.

- EPA should review the CCR process to determine if it can be used as a more effective public education tool.

  The CCR concept should be reviewed and revised to be a more effective public education tool. While the current CCRs contain a significant amount of data addressing water quality and regulated contaminants, the reports do not emphasize the value and cost of regulatory compliance. When an individual system is confronted with a potential MCL violation, the CCR should be expanded to discuss the risk avoidance associated with regulatory compliance, the options available to meet water quality standards, and the cost/rate impact of the solution. In addition, the CCR could be used as an effective tool for educating the public on aesthetic water quality issues and other consumer satisfaction concerns. In these cases, the CCR could be structured to address the cultural, education, language, and values of a specific community.

- EPA should review the SDWA variance/exemption processes to ensure that stakeholder education and input is achieved at the earliest reasonable date)

  Consumers in a community confronted with a health-related drinking water quality issue need to be informed of the health risks and compliance costs as early as possible. While a requirement of the affordability variance process is public education and hearings, the education derived from these hearings occurs near the end of the process – often too late for effective public education and input. By State and local officials taking a leadership role in early communication of the risk avoidance of approved drinking water quality and the compliance costs/options for a specific community, valuable stakeholder input can be derived. These education programs need to include an explanation of the "two-tiered" regulatory standard, potentially implemented by the affordability variance process, and the fact that capital expenditures will probably be required even if a higher MCL is allowed. In some

communities, this information alone may avoid the official initiation of the small system variance technology process.

6.0 Conclusions and Recommendations

This document represents the report and recommendations of NDWAC's Work Group on the National Small Systems Affordability Criteria. The Work Group was asked to provide advice to the NDWAC to assist it in developing recommendations for the EPA on the national small systems affordability criteria required under the SDWA and on related matters.

The conclusions and recommendations resulting from the deliberations of the Work Group are summarized in the remainder of this section. The Work Group operated under the ground rules of its parent organization, the NDWAC, as well as Work Group-specific operating protocols. The Affordability Work Group used consensus decision-making procedures to guide its deliberations, while recognizing that consensus would probably not be reached on all issues. Where consensus could not be reached, the Work Group was asked to present the range of views expressed, along with a discussion of the potential pros and cons associated with the various alternative approaches. Minority views and additional comments can be found in Appendix 1.

6.1 Affordability Criteria

The charge to the NDWAC Work Group included a request to review, analyze, and provide recommendations regarding six small system affordability criteria issues. EPA's affordability criteria establish national guidelines for determining when new drinking water standards are deemed "affordable" for small water systems throughout the United States. If it is determined (based upon the affordability criteria) that achieving the new standard is unaffordable, small water systems are eligible to request a variance from the system's State agency responsible for implementing and monitoring EPA standards (the "primacy" agency). The granting of such a small system variance from the national standard is contingent, however, upon the system agreeing to acquire an alternative, more affordable technology that brings the system closer to compliance with EPA standards, but does not meet the MCL.

Therefore, the affordability criteria set forth by EPA are important SDWA implementation guidelines. As indicated, if a small system technology variance is granted, the system's customers will receive water that is more "affordable," but of lesser quality than national EPA standards would otherwise require. The awarding of variances suggests that there could be two water quality standards for American citizens depending on the system from which they acquire their drinking water. Citizens obtaining water from systems for which the new standards are affordable may have access to higher quality water than those who obtain their water from small systems that cannot afford to implement the technology required to meet the new MCL.

While the dual standard possibility raises equity and other questions, the elimination of the technology variance option for some small systems raises other concerns. For example, if variances are not an option, new stringent water quality standards are "truly" not affordable — and no funding assistance, alternative higher quality water sources, or restructuring options are available — some small water systems may continue to operate "as they were," meeting neither

the desired national standard nor an acceptable lesser standard which could be achieved with a variance and the adoption of an alternative EPA-approved technology.

In setting the national small system affordability criteria, EPA attempted to provide criteria that could be equitably and uniformly applied across the nation, that could be clearly understood, and that would be responsive to technological and economic changes over time. The affordability standard was based on the concept of an "expenditure margin." EPA's expenditure margin is calculated by determining the difference between an assumed "maximum affordable water bill" (which EPA assumed to be 2.5 percent of MHI) and the current cost of water for the median system (current baseline water bill) of a given size category. If the new rule can be implemented for a marginal cost that is less than the expenditure margin, the new standard is affordable for the median household of the median small system. If the cost of the technology to meet the new standard for a selected subset of small systems exceeds the "expenditure margin," then the standard is deemed unaffordable for that subset of systems. Also, a small system variance technology that is potentially applicable to systems within the relevant size and raw water quality criteria is "approved" or "listed" by EPA. Once such a small system variance technology has been identified by EPA, the States may, on a case-by-case basis, allow systems that meet the same size and raw water criteria to use the small system variance technology. Each State will set its own process for considering small system variances. While the States must demonstrate that their programs are protective of human health, they are not bound to use the same economic criteria that EPA uses to determine which small systems in the relevant subset can afford to meet the MCL without the use of a small system variance technology.

The implications of the process for setting the affordability criteria are clear. If the affordability standard is set too high, few, if any, systems will be eligible for variances. If variances and alternative technology options are not permitted for small systems that cannot truly afford full compliance — and no funding support, restructuring options, or alternative water supplies are available — such systems may operate dramatically out of compliance (with no technology change), and their customers may continue to be exposed to high levels of the contaminant for which the standard was established. On the other hand, if the affordability standard is set too low, more small systems will be eligible to make variance requests and more systems — some of which could actually afford to achieve full compliance — may be granted variances by the States to use alternative, less effective technologies. As a result, more water systems will be permitted to operate with water that does not meet the EPA MCL national standard and the dual standard, issue will be exacerbated and, in a sense, officially condoned.

6.1.1 Recommendations Regarding National Affordability Criteria

Given the importance and potential impacts of the affordability criteria chosen, EPA asked the Work Group to consider six issues associated with the Agency's proposed affordability criteria. The six issues considered by the Work Group at EPA's request, along with summary responses, are as follows:

1. **Should MHI or another income percentile measure (such as per capita income, for example) be used for the income level?**

   - While Work Group members note that it is possible that a better metric for determining water system affordability may be available in the future, they agreed that MHI is the most appropriate income metric to use for this purpose at this time. The metric is unambiguous and available for all regions of the nation. Consequently, it is felt that MHI provides a simple, consistent income metric to use in determining "ability to pay."

2. **Should 2.5 percent or another percentage be used as the income percentage for determining the maximum affordable water bill, and what is the basis for an alternative selection?**

   - The Work Group recommends that EPA seriously consider replacing its basic affordability methodology with an incremental approach to affordability determination. Specifically, the group recommends that the national incremental affordability threshold for each rule be set at a specific percent of MHI that EPA would then apply to individual rules for purposes of determining whether to issue small system variance technologies. See below for the recommended increment.

   - The Work Group recommends setting the increment at 1 percent of MHI. (One of the 18 Work Group members opposed this recommendation, advocating for a lower percent.)

   - When a State decides whether to allow a variance, it should consider the "quantum leap" and "rate shock" phenomena. This issue occurs when small systems that have no treatment, or little treatment (e.g., chlorination only), for the first time must invest in significant water treatment. This will trigger potentially significant one-time investments (such as manifolding wells, establishing a centralized treatment building and equipment unit, etc.) that probably will not have to be repeated if future rules are issued.

   In addition, when making variance decisions, States should consider the cumulative impacts of multiple regulations and other cost-raising factors (e.g., infrastructure and security) that may affect a particular system. The Work Group encouraged States to consider an extended time horizon in making variance decisions, encouraging systems to invest for their long-term viability. The Work Group notes that this recommendation may have broader implications regarding financial assistance to systems (e.g., a State might decide to set eligibility for financial assistance relative to a certain cumulative impact).

   - The Work Group also agreed that, when a State is considering whether to allow a variance, a strong effort should be made through a meaningful local public education and local public participation effort, to ensure consumers are informed and understand variance technology does not result in water quality that meets

EPA standards, the implications of the two-tier phenomenon, and options they may have. These efforts should be ongoing to ensure that new consumers are educated using simple, straightforward language. Related legal requirements (found in SDWA section 1415(e) and EPA regulations at 40 C.F.R. section 142.301 et seq.) should be followed, including:

- Conducting a local hearing;
- Conducting a meaningful review for the system applying for a variance as to whether the system cannot afford to comply through:
  - Treatment;
  - Alternative source of water supply;
  - Restructuring or consolidation; and /or
  - Financial assistance under the DWSRF administered by EPA and the States, the USDA's RUS, CDBG Program administered by HUD, or other State or federal programs.
- Assuring that the system has the financial and technological capability to install, operate, and maintain the equipment;
- Assuring that the variance will ensure adequate protection of human health and meets all legal requirements for a variance;
- Tracking compliance with the variance; and
- Reviewing the adequacy of the variance at least every 5 years.

- Finally, the Work Group recommends that EPA (1) re-evaluate variance technologies and BAT at least every 5 years to take account of technological developments as treatment technologies may become lower in cost for small systems, and (2) share resulting information with State primacy agencies to assist in their 5-year reviews of variances and their assessments of whether to approve variance technologies for specific systems.

  Given the affordability criteria recommendation of the Work Group (a substitution of an incremental approach for the EPA expenditure margin methodology), the question of whether 2.5 percent of MHI is an appropriate standard becomes somewhat irrelevant. However, the question of whether 2.5 percent of MHI is a reasonable value for the affordability metric was aggressively discussed and debated, with the Work Group not reaching a consensus on the issue, assuming EPA maintains the current methodology.

Work Group members supporting a lowering of the standard to 2 percent of MHI or less raised concerns, as did the SAB, about the apparent fact that no systems had qualified for variance consideration with the current standard. Work Group members suggesting that 2.5 percent or a higher value be used were concerned that a "widening of the door" or increasing the likelihood of variance considerations for small water systems might promote a two-tier system of water quality standards and delay otherwise achievable improvements in water quality. In summary, the Work Group prefers an incremental approach to affordability criteria setting. If EPA decides to continue use of its current methodology, no recommendation is offered regarding the question of whether 2.5 percent is an appropriate MHI standard.

3. How should the expenditure baseline be adjusted to account for new rules?

- The Work Group expressed several concerns regarding the use of the expenditure baseline. Among the concerns raised were:
  - Concerns with the source of baseline calculation data (the CWS survey);
  - Concerns regarding whether the CWS data included all costs of small systems;
  - Concerns about the impact of rehabilitation and replacement costs on the baseline analysis;
  - Concerns about the added costs of security and anti-terrorism and how such costs might distort the calculation of the expenditure baseline;
  - Concerns about whether baseline cost calculations can appropriately consider the impact of technical, managerial and financial (TMF) costs;
  - Concerns about whether the baseline adequately reflects the availability of subsidies or financial assistance (see question 5 below);
  - Concerns about whether small systems reporting into the CWS were amortizing/capitalizing their reported expenditures; and
  - Concerns about whether low-income households' potentially lower-than-median water usage and rates are captured in the baseline calculation.

The Work Group emphasizes, again, that it recommends an incremental approach. However, if EPA continues use of the current model, efforts should be undertaken to deal with the above concerns. In this case, the Work Group recommends factoring into the expenditure baseline those costs – regulatory and otherwise – that systems nationwide generally incur.

4. Should separate affordability criteria be developed for surface and groundwater?

- The same criteria should be applied to surface and groundwater systems.

5. Should financial assistance be incorporated in the calculations of the expenditure baseline?

- If EPA retains the present approach to making the national affordability determination, financial assistance should be incorporated in the calculations if the financial support is generally available to all systems nationwide. If only "unique" sources are available, the determination of financial assistance should not be included in the calculations relative to the national criteria. However, regardless of whether EPA uses the present approach to making the national affordability determination or adopts the Work Group-recommended incremental approach, the availability of financial assistance should be included in the calculations and analysis conducted by the State, when it is ultimately determined whether a variance should be granted, and what the variance compliance schedule will be. (See SDWA §1415(e)(4).)

6. Should regional affordability criteria be developed, given current data limitations?

- If EPA retains its current approach to making the national affordability determination, regional affordability criteria should be developed and implemented if data are available from suitable sources to make eligibility determinations. However, due to recognized small system operational cost differences, it is recommended that EPA establish differential regional affordability criteria as soon as the compliance cost data are available. To more accurately reflect the actual ability and/or willingness to pay, the MHI for small systems should be further differentiated into "rural" (non-metropolitan) and "urban" categories.

  The Work Group also considered whether to recommend applying the incremental approach on a regional basis. However, most opposed this idea, deeming it impractical given the data limitations.

6.1.2 Comparison of Work Group and EEAC of EPA's SAB Recommendations

The Environmental Economics Advisory Committee (EEAC) of EPA's SAB was asked to comment and provide recommendations on a series of policy issues similar to those posed to the Work Group. This section provides a comparison of the EEAC's and the Work Group's recommendations regarding the six questions posed to both groups.

Median Household Income

The Work Group and the EEAC agreed that MHI was a reasonable metric upon which to base household affordability assessments. The EEAC indicated that MHI avoided potential "pitfalls" of alternative measures such as "mean income," which may be distorted or "skewed" by a small number of wealthy individuals in a system. Among other reasons, the Work Group supported the MHI metric due to its simplicity, unambiguous nature, and national availability.

Appropriateness of 2.5 percent of MHI as the Affordability Threshold

The EEAC and the Work Group raised concerns that no variances had been granted by EPA using the 2.5 percent of MHI as the threshold criterion. The EEAC suggested that EPA consider other affordability thresholds such as affordability decision rules used in health sciences and transportation or lowering the percentage. The EEAC did not suggest an alternative percentage of MHI as the appropriate threshold. In contrast, the Work Group, after reviewing empirical examples of the use of the 2.5 percent threshold concluded that 2.5 percent of MHI might be acceptable. However, the Work Group felt that other affordability standards should be considered and, ultimately, decided to recommend that an incremental approach be substituted for the 2.5 percent affordability threshold. Specifically, the Work Group recommended that EPA adopt an affordability criterion of 1 percent of MHI as the "incremental" affordability threshold for each new regulation proposed by EPA.

The Calculation of EPA's Expenditure Baseline

The EEAC felt that the expenditure baseline calculation neglects variations in costs or other economic circumstances that might affect affordability. Therefore, if the expenditure baseline is used to determine affordability, the expenditure baseline should be used only for an initial "screening function." The EEAC suggested that greater focus should be given to individual cases to determine affordability. The Work Group's recommended incremental approach to affordability determination does not use an expenditure baseline, so it is irrelevant to their recommended affordability criteria. However, the Work Group identified several concerns regarding the expenditure baseline that should be dealt with if EPA ultimately decides to maintain its current approach to affordability assessment. In addition, the Work Group recommends, under its suggested incremental approach, that States take system-specific circumstances into full consideration.

Same Criteria, Regardless of Water Source

Both the EEAC and the Work Group recommended that the same affordability criteria be used regardless of water source.

Consideration of Financial Aid in Affordability Calculations

The Work Group and the EEAC concluded that financial support should be incorporated in affordability determinations if such support is readily or uniformly available to small systems.

Different Regional and Urban/Rural Affordability Criteria

Both study groups supported the development of affordability criteria that reflect differential regional and urban/rural EPA regulation compliance costs if data are available to support such affordability assessments.

6.2 Financial Support Strategies for Addressing Affordability Challenges

One method of helping overcome problems with the affordability of drinking water is to provide additional financial support to water systems or individual households that have affordability problems. Financial support can be funded at the individual system level, the State level, or by the federal government. If financial assistance is made more readily available for small water systems facing infrastructure improvements and/or operating costs to meet regulatory requirements, the need for variance technologies may be reduced. In addition, under certain circumstances, financial assistance may be reflected in the way in which EPA calculates affordability at the national level.

The Affordability Work Group has examined the matter of financial assistance, and is presenting several suggestions on this issue:

- Providing rate-making information;
- Providing support to individual households (as distinct from systems) in the form of a LIWAP;
- Making changes in the way that existing funding sources are used that will better support small systems with affordability problems; and
- Providing new funding sources to help solve this problem.

6.2.1 Rate-Making Strategies

For many water systems, it is possible for rate-making techniques to allow water to be affordable to most, if not all, of their users without placing an undue burden on any user. Many water systems already employ some type of "lifeline rates" to address the affordability issue and to promote water conservation. Affordability ratemaking techniques work best when the eligibility for the application of a rate structure that is less than the cost of providing water service is limited to low-income households.

While systems of any size that are predominately made up of low-income households will not be able to significantly address the affordability issue internally, systems of all sizes that have a minority of low-income households can assist their poorest customers with rate-making strategies. In order to promote the affordability of water without heavy reliance on small system variance technologies, EPA should publish information about and examples of affordability rates.

6.2.2 Low Income Water Assistance Program

LIWAP is being presented as another tool to help States assist low-income households facing increased rates due to costs associated with compliance with the SDWA. Assistance to low-income households is provided for other utility services. Providing assistance directly to those who are in need is the fairest and most effective way to provide support to achieve compliance. Two of these programs are the LIHEAP and the Universal Service Low Income Program (for local phone service).

While the total cost of a LIWAP program would depend on its eligibility requirements, the cost should be significantly less than the LIHEAP program because fewer households are served by a water utility than are eligible for energy assistance. If eligibility was limited to those low-income households receiving water service from a small water utility with high rates (e.g., >$500), then the cost of this program would be relatively moderate, perhaps as low as $750,000 per year.

By providing financial assistance at the individual household level, rather than, or in addition to, assistance at the system level, more of the taxpayer funding would go to households in need. When a water system is subsidized, all ratepayers benefit from taxpayer support, even those who are not low income. Since there are similar existing programs that can be used to help determine eligibility, administrative costs of a LIWAP should be lower.

Several methods of providing funding for a LIWAP were considered and it is recommended that the best method to fund such a program would be through a Congressional appropriation, similar to the way the LIHEAP is funded.

6.2.3 Modification of Existing Programs

Although affordability is best addressed at the individual household level, there are State and federal programs that provide financial assistance to water utilities to help make the cost of water affordable as significant infrastructure improvements are being required to meet ever-changing regulatory demands. One major financial assistance program is the DWSRF. To help make this important funding program more effective in addressing small system affordability issues, the barriers to small system utilization should be examined and, where appropriate, changed. Since cooperative efforts are very effective in helping small system affordability problems (see section 4), a larger share of the DWSRF disadvantaged assistance funds should go toward supporting these cooperative efforts.

6.2.4 Potential New Funding Sources

Since the cost of safe drinking water is increasing, especially in small systems facing mandatory infrastructure improvements to meet SDWA requirements, new funding sources may be required in order to lessen affordability issues for drinking water. While the DWSRF was established for this purpose, other funding sources, as well as additional funding for the DWSRF, should be considered.

Targeted grant programs that could make small systems self-sustaining (e.g., grants for cooperative efforts such as consolidation or restructuring as defined and discussed in section 4 of this report) should be considered. Existing agencies and programs could be expanded to provide assistance for a greater number of drinking water systems in order to promote affordability. Specifically, the U.S. Army Corps of Engineers and the Bureau of Reclamation could be better involved in water system efforts, such as providing interconnections between systems.

6.2.5 Recommendations Regarding Financial Support Strategies

- EPA should provide information and examples pertaining to the use of affordability rates for systems to help make water affordable to low-income households.

- A Low Income Water Assistance Program (LIWAP) should be adopted as a means to assist low-income households facing high drinking water costs, funded with a Congressional appropriation similar in structure to (though clearly requiring far less money than) the funding for the LIHEAP.

- DWSRF funding should be increased, with special consideration given to assisting small systems.

- . The Work Group proposed that EPA modify the DWSRF allotment formula. The NDWAC believes such an action is premature and instead recommends that EPA determine if, as a result of the current DWSRF allocation formula, small public water systems are being disproportionately denied funding from State DWSRF programs due to inadequate funding being available.[30]

- . The Work Group proposed that any disadvantaged system should receive priority for DWSRF funding. With the understanding that not all States currently have disadvantaged programs, the NDWAC changed the recommendation to propose that EPA encourage States, that have not already done so, to establish a disadvantaged community program to address small system affordability issues. Such funding should be consistent with the principles in the DWSRF to encourage restructuring where viable.

- EPA should work with other agencies to help overcome barriers to effective use of existing funding sources to promote small system affordability for safe drinking water. Examples of such assistance include:

    - Increasing outreach efforts to small systems of all classes to provide information on available funding programs.

    - Increasing the technical assistance to small water systems to address needs in the areas of funding applications, accounting and long-range planning, engineering

[30] See Appendix 1 for additional comments.

and technical corrections, and record-keeping practices consistent with the needs for funding and SDWA requirements.

- Improving the opportunities of small systems to acquire funding from all sources, governmental and private. Increase the use of grant funds, zero interest loans, and other means of assistance to low-income water systems in need.

- Analyzing methods of removing institutional barriers at both the State and federal levels that prevent small systems from obtaining funding and complying with SDWA requirements in an affordable manner.

- Establishing new, and expanding existing, sources of funding to provide assistance to small systems in all areas of achieving and maintaining system capacity.

- Provide additional funding beyond the current DWSRF funding for small systems to adopt cooperative strategies, as broadly defined in section 4.2.1

- Explore and consider the use of other State and federal agencies, such as the U.S. Army Corps of Engineers and the Bureau of Reclamation, to assist small drinking water-related projects.

6.3 System-Level Strategies for Addressing Affordability Challenges

Minimizing the capital and operating costs associated with regulatory compliance is another important component of SDWA compliance affordability. Traditionally, a system's regulatory compliance costs are derived by pricing a treatment facility (at the system's current flow capacity) based on the particular contaminant of concern. However, to minimize costs and promote system sustainability, all options that achieve full regulatory compliance need to be considered prior to and during the small system variance process. The cost of compliance solutions can be reduced through creative funding incentives or by innovative management, technical, and/or operating solutions.

The Affordability Work Group's CSLS investigated non-financial approaches for reducing the cost of small system compliance. By expanding compliance options beyond individual contaminant removal by conventional treatment, more cost-effective solutions can be identified and implemented, and the need for variances reduced. To determine the most cost-effective solution for small systems, innovative approaches need to be considered. These approaches include cooperation/consolidation/regionalization, decentralized treatment, and capacity optimization.

6.3.1 Cooperation

Probably the most effective long-term compliance option for small systems is a cooperative approach. This approach is being increasingly implemented to achieve cost reduction and greater water management expertise. Cooperation is achieved through physical

interconnection of independent water systems or by sharing resources within a region. The numerous potential benefits of cooperation include economies of scale for both capital and operating costs, financial assistance, and better access to planning and technical expertise.

While federal and State policies have increasingly emphasized the benefit of consolidation, significant political, geographical, and business barriers have prevented widespread consolidation. Section 4.2.1 describes these barriers and provides a list of suggested actions, programs, and approaches to encourage and enhance cooperation. Enhanced State leadership, private sector resources and expertise, involvement of larger utilities, and local participation are recommended elements in the initiation and success of cooperative efforts.

6.3.2 Treatment Technologies

The technologies to treat and deliver water that meets all SDWA standards are known and available (see section 4.2.2). Recent process enhancements have exhibited a trend of reduced costs and improved performance. Research and new product development needs should continue to be encouraged to lower the capital and operating costs of centralized treatment. Additional qualified personnel and training is also needed to effectively maintain and operate new technology that is used to remove newly regulated organic, inorganic, and microbiological contaminants.

6.3.3 Alternatives to Central Treatment

There are alternatives to centralized treatment for individual small systems that in some cases can provide cost-effective and sustainable solutions for regulatory compliance. As presented in section 4.2.3, the cost-effectiveness and practicality of POU and/or POE treatment needs to be evaluated on a system-by-system basis since the cost of implementation is site-specific. System size, type and volume of water used within a system, and the number and type of contaminants present must be considered in the evaluation. Improved education addressing how and when to use POU/POE devices is also needed. In addition, a process for POU/POE performance monitoring (for current and future consumers within a residence) should be addressed. While POU and POE are allowed by federal legislation, State and local support for this treatment approach would be enhanced by the development of POU/POE distribution, maintenance, and “certification” procedures.

Alternatively, since less than 1 percent of a consumer’s water is ingested, bottled water may be an appropriate solution for certain contaminants for a limited number of small systems. However, federal and State legislative changes are needed and significant public education would be required before bottled water can be considered a permanent solution to regulatory compliance. Additional measures to ensure the quality of bottled water may also be required.

6.3.4 Capacity Optimization

One of the areas most frequently overlooked in determining the cost and affordability of regulatory compliance is a system’s flow capacity requirements. As presented in section 4.2.4, there are several methods to reduce a system’s production and distribution capacity

requirements, thereby reducing compliance costs. Whether centralized treatment or a cooperative solution is determined to be appropriate for compliance, the cost of that solution can be further reduced through supply-side or demand-side management.

Control of water loss, a problem in many small systems with deteriorating infrastructure, can help control the significant increases in operating costs associated with the new treatment technologies required for compliance. Optimizing a small system's distribution system design can potentially result in a significant reduction in needed treatment plant capacity. Demand management, through individual customer metering and rate design, can also cost-effectively reduce the volume of water needed from an alternate source or treatment facility for compliance. States should encourage investigation of each of these small system capacity issues prior to finalizing the financial burden of compliance and when considering variances.

6.3.5 Recommendations Regarding System-Level Strategies for Addressing Affordability Challenges

- New and expanded State leadership is essential to promote cooperation among small systems. Cooperative efforts designed for an area or regions are essential if the cost of compliance is to be reduced. These efforts should be funded through new appropriations or through re-allocation of a portion of DWSRF funds that are currently being applied to individual system projects. State-managed cooperative efforts should include:

  - Providing managerial, technical, and planning assistance for small systems, including expanded use of the private sector and large central utilities that can provide these services;

  - Public outreach to small systems to provide support and information on the value of cooperative and consolidation efforts;

  - Conducting focused outreach programs to regional groups directly or in conjunction with others, and allowing cooperation expenditures by these groups to be considered in federal and State financial assistance programs;

  - Continuing and improving methods of recordkeeping and reporting progress on capacity-building programs (consistent with SDWA capacity development provisions) and reporting progress in achieving small system cooperation and consolidation to EPA and the NDWAC. EPA and States should use this information to develop and maintain an effective small system cooperation database that can be used to promote cooperation;

  - Offering meaningful incentives for assessing whether cooperative efforts are feasible and limiting financial and technical support for individual system compliance solutions to small systems that have assessed cooperative options and found them to be infeasible or not cost-effective; and,

  - Assistance to community groups, system operators, and owners in the development of governance, advisory, or other participatory vehicles to ensure a continued role for these stakeholders when cooperative solutions are implemented.

- Consider regulatory changes to allow the use of system-provided bottled water in appropriate cases, either as a variance technology or to achieve compliance (with primacy agency approval) for non-microbial, non-inhalation, and non-dermal compliance situations. The use of bottled water should be considered only when it meets applicable standards, is accompanied by a public education program, and the system guarantees quality assurance.

- Recent scientific and technical developments have increased the potential for "umbrella" compliance technologies, such as membranes. EPA should establish a Work Group to review the technical and policy feasibility of allowing a "Super" BAT approach to provide affordable, long-term compliance, including the consideration of appropriate incentives regarding future compliance.

- When examining the cost of regulatory compliance at the national or State level, system flow capacity optimization (achieved through control of water leakage, metering, rate structure, and facility design) should be considered prior to developing the cost of treatment technologies and/or cooperative solutions.

6.4 Public Education

Public education is an essential component of any SDWA variance process. For the consumer to make an informed decision on the desired quality of their drinking water, they must first understand the public health risk and other water quality benefits, cost of compliance, and compliance options. Effective public education, which is structured to allow stakeholders to participate in developing and understanding solutions for regulatory compliance, must be initiated at the earliest possible date.

However, the difficulty of communicating the messages associated with water contaminants must be recognized. The goal of the communication/education process should be to engage as many consumers and other stakeholders as possible to create a forum with a wide variety of perspectives. An effective public education program must also address local concerns, cultures, and issues. Therefore, a strategic public education plan should be developed to identify the process that most effectively addresses compliance and affordability issues, along with related resource needs.

6.4.1 Recommendations Regarding Public Education

The Work Group recommends that EPA take the steps listed below with respect to educating the public about issues related to the affordability of drinking water and small system variances. The Work Group recommends that EPA undertake these steps with outreach to, and input from, stakeholders.

- EPA should determine the scope, feasibility, and cost of implementing a national public education campaign that addresses the health risk and benefits (risk avoidance) of improved drinking water quality and implement such a campaign if feasible.

- EPA should review the CCR content to determine if the CCR can be used as a more effective public education tool.

- EPA should review SDWA variance/exemption processes to ensure that stakeholder education and input are achieved at the earliest possible date.

6.5 NDWAC Perspective

The NDWAC agrees with and adopts the Affordability Work Group's recommendations with the following clarifications.

The NDWAC fully recognizes the importance of affordable and safe drinking water, especially for small systems. The 1996 Amendments to the SDWA established the principle that variances in water treatment technology could be used to address the issue of affordability. However, significant practical, logistical, and ethical issues mitigate against the use of variances.

For example, the cost of establishing the appropriateness of a variance for a specific small system is significant. The heightened monitoring and regulatory burden that would fall to State and local authorities is unacceptable for many of them. Furthermore, the potential acceptance of lower water quality for disadvantaged communities is ethically troublesome.

The NDWAC believes that alternatives to the variance process identified by the Work Group (such as cooperative strategies, targeted use of funding to disadvantaged water systems, a Low Income Water Assistance Program, etc.) are more appropriate means to address the affordability problem. Therefore, if a variance process is deemed necessary to achieve affordability, it should only be pursued after all other alternatives presented in this report are given due consideration. However, because of the NDWAC has pragmatic and ethical concerns with variances and the associated connotation of a 2-tier approach to protecting public health, the Council makes the following recommendation:

- The NDWAC advises the Administrator to convey to Congress the NDWAC's logistical and ethical concerns with variances and the NDWAC's position that variances in the extent of water treatment, as a means to achieve affordable compliance, be reconsidered.

The NDWAC recognizes that the incremental approach recommended by the Affordability Work Group is designed to avoid "rate shock" and mitigate the excessive costs of any single rule. However, the NDWAC believes that the cumulative cost of drinking water regulations is also an important consideration in affordability determinations. The NDWAC is concerned that the incremental approach alone does not sufficiently address the cumulative costs of several rules and other operating cost burdens (e.g. infrastructure replacement) that

collectively may be "unaffordable" for some systems. The Work Group gave careful consideration to this important issue (see Pages 20-23, 86-89, and Appendix 5), and recommended that, where EPA identifies a need for variance technologies at the national level based on an incremental approach, States consider cumulative impacts at the system-level in determining whether to approve individual variance requests.

Cumulative impacts should be considered, for example, in determining eligibility for grants, loans, and funding under the DWSRF. In addition, if variances are to be made available, cumulative impacts should be considered in determining system eligibility for a small system variance. In order to assist states in making affordability determinations for individual systems:

- The NDWAC recommends that EPA augment the incremental approach with reasonable cumulative affordability guidelines that could be used by the states to determine the eligibility for small system variances and/or financial support.

Appendix 1
Minority Views and Additional Comments

National Rural Water Association

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January 27, 2003

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Ms. Marci DuPraw
Senior Mediator
Resolve, Inc.
1255 23rd St., NW, Suite 275
Washington, DC 20037

Dear Ms. DuPraw:

The National Rural Water Association (NRWA) is respectfully submitting a small community affordability report to the National Drinking Water Advisory Council (NDWAC) Affordability Workgroup. The attached report describes the consensus position of over 22,400 small and rural community members of NRWA. We request that our Executive Summary be included in the Executive Summary of the panel's report and that our full report be included immediately following the panel's Executive Summary. If this request is not acceptable please contact us.

The NDWAC Panel has recommended numerous activities that are either not authorized by the Safe Drinking Water Act (SDWA) or would be impossible to implement. Our organization urges EPA to concentrate on fixing the variance provision and the means to implement the provision. We recommend using a framework based on the following criteria:

1. Establish variance technology for every EPA rule that can be applied at the state and local level. The proposal by the panel to use an incremental approach - 1% of MHI per rule ($400) - is contrary to the very reason for an affordability policy. First, it uses a *national* median household income (we are talking about lower-income rural households that have a problem). Second, the panel generally agrees that this approach will not help any of these small systems meet the arsenic requirements. Why do we need a panel to confirm the status quo?

2. EPA should list variance technologies for all applicable rules. Authority for implementing the variance technology should be retained at the state and local level. States will decide on a case-by-case basis (based on local conditions) the appropriateness of variance technology. For example, some states use their own affordability test of 1% of the specific communities MHI to determine "disadvantaged community" eligibility for SRF funding – which may also be appropriate for variance technology decisions.

Quality On Tap!
Our Commitment Our Profession

There are a number of concerns our organization has with the NDWAC affordability panel and their conclusions. Below are the major issues that we believe are inherent to the panel and the process used in developing the panel's report:

- EPA has a vested interest in defending an affordability policy that the SAB indicated was broken. The agency expressed no real interest in significant changes to the existing policy.

- The panel did not adequately represent small systems. Colleges, private water systems, environmental organizations, state primacy agencies, and large water systems do not represent the types of systems that have to pay the unaffordable rates—so it is easy to come up with a solution that does little good for the low-income rural water customer.

- The panel's report is over 200 pages long—with an executive summary of 20 pages. It includes recommendations that go beyond the authorizations of the SDWA. In that law, EPA has limited authority in the issue of consolidation or the recommendation of funding alternatives. Any recommendations in those areas depend on institutions outside of EPA and are either unworkable or politically impossible to accomplish.

- EPA has the authority and the SDWA expectation that it will provide:

    - A workable small system variance;
    - A definition of the URTH for each contaminant; and
    - An affordability policy that actually helps low-income rural small systems afford compliance.

EPA should implement the small system variance provisions in the SDWA as intended by Congress and avoid bringing outside institutions into the process that are not impacted by this provision. Nor should EPA go beyond the clear boundaries of authority set forth in the SDWA.

Thank-you for the opportunity to submit this consensus report, on behalf of over 50% of the small communities across the nation.

Sincerely,

Robert Johnson
Chief Executive Officer

Attachment: Small and Rural Community Affordability Consensus Report

Small and Rural Community Affordability Consensus Report

National Rural Water Association
January 27, 2003

Executive Summary

The National Rural Water Association (NRWA), representing over 22,400 rural and small community members, submitted a separate report because small communities believe the NDWAC affordability Work Group's report: (1) recommends a new affordability level that is clearly unaffordable for millions of low-income families and many communities by any reasonable definition of affordable, (2) does not provide a reasonable and workable small systems variance technology program as mandated in the SDWA that allows small and low-income communities to comply with rules without experiencing harmful tradeoffs, and (3) recommends new (or changes to) federal, state, and local programs for public education, viability, full compliance, revised CCR requirements, capacity, rate structures, federal funding programs, SRF review requirements, consolidation, water tax, state policy on SRFs, variances and exemptions, and the USDA programs/authorities. These recommendations are all steps in the wrong direction for assisting small and low-income communities comply with rules because each recommendation shares a common theme of eroding local government authority, control, and protection. Small communities support exploiting all legal options to provide low-income and small/rural communities with compliance options that are affordable and protective of public health. However, the majority's report falls short of this simple goal.

NRWA urges EPA to adopt the safe and affordable variance approach (SAVA) detailed in this small and rural community consensus report. To date, EPA has determined all regulations are affordable for small communities and therefore has not allowed any use of variance technologies. If the Congressionally prescribed solution to the affordability problem is unworkable because EPA cannot determine variance technology policy (i.e., reasonable affordability standards, contaminant concentrations that are "protective of public health," and alternative variance treatment methods) then this should be clearly stated and reported to Congress. Until such time that Congress determines they need to rewrite the Act, we should assume they meant what they passed in 1996.

Small and Rural Community Affordability Consensus Report

National Rural Water Association
January 27, 2003

1.0 Introduction

Included in the National Drinking Water Advisory Council (NDWAC) affordability Work Group's (referred to as "the panel") mission was a review of the Environmental Protection Agency's (EPA) "affordability" policy for small communities. Currently EPA uses a metric of 2.5 percent of median household income (or approximately $1000 per year) as the indication of an affordable drinking water bill. Review of this EPA administrative policy was the single most important issue for small communities and was our primary reason for participating on the panel. EPA's affordability policy has been found inadequate by their Science Advisory Board, the National Rural Water Association, and, to some limited extent, this NDWAC panel. However, there has been no consensus on exactly how to "fix" or modify EPA's policy.

Many members on the panel supported a policy of increasing water bills by 1 percent of median household income (or $400) as an alternative to EPA's affordability determination. We are encouraged by the finding that EPA's policy needs to be changed, and appreciate being part of the deliberations. However, small communities have a different perspective and we respectfully dissent from the panel's report. Our report represents the consensus recommendations of small communities. Therefore, we have prepared this separate small community consensus report because the panel's report: (1) recommends a new affordability level that is clearly unaffordable for millions of low-income families and many communities by any reasonable definition of affordable, (2) does not provide a reasonable and workable small systems variance technology program as mandated in the SDWA that allows small and low-income communities to comply with rules without experiencing harmful tradeoffs, and (3) recommends new (or changes to) federal, state, and local programs for public education, viability, full compliance, revised CCR requirements, capacity, rate structures, federal funding programs, SRF review requirements, consolidation, water tax, state policy on SRFs, variances and exemptions, and the USDA programs/authorities. These recommendations are all steps in the wrong direction for assisting small and low-income communities to comply with rules because each recommendation shares a common theme of eroding local government authority, control, and protection. Small communities support exploiting all legal options to provide low-income and small/rural communities with compliance options that are affordable and protective of public health. However, the majority's report falls short of this simple goal.

2.0 Support and Explanation of Small Community Affordability Position

- *Scott J. Rubin: Evidence that EPA's and Majority Recommendation Are Unaffordable*

  Scott Rubin's presentation to the NDWAC panel showed that the lowest 20 percent of households (25 million households in the U.S.) are already paying more in their

public health expenditures than their income permits (Scott J. Rubin, *Criteria to Assess Affordability*, NRWA 2002). Therefore, any increase in water rates for these economically "sensitive subpopulations" is unaffordable. What is confounding to small communities is that **Rubin's studies and evidence are not in dispute by the panel**. Yet, the majority still recommended that these families could afford up to an additional $400 per year **per rule**.

- *The Affordability Metric*

Rubin's analysis of data from the 1990 census shows only a weak correlation between MHI and the level of poverty in a community. Rubin found that at the median income of approximately $30,000 in 1989, the level of poverty ranged from zero to more than 20 percent in U.S. countries. That is, communities with the same median income can have poverty rates, and the presence of low-income households, that vary drastically from one another.

The use of MHI computed as a national aggregate as the sole metric for determining affordability has many problems. NRWA believes that MHI masks the financial hardship that low-income communities and low-income households have in meeting many of the existing regulations. The purpose of the national – level affordability determination is to identify the likelihood that small water systems will be able to afford to comply with a regulation without creating a serious risk of adverse health consequences. The fact that a certain level of expenditure is affordable to the median income household in a community tells us very little about the ability of the low-income households in the community to afford the same level of expenditure.

A more equitable metric can be found for determining affordability for small water systems. Our organization has outlined a policy that maximizes public health protection under the section titled, "Safe and Affordable Variance Approach." However, if EPA uses MHI as a metric of affordability until a more equitable metric can be found, an adjustment must be made for the differences in rural vs. urban communities. There are fundamental differences between rural and urban communities. Some of these differences are obvious: rural communities are less densely populated and tend to have smaller water systems. Some of the differences are not so readily apparent: there are a large number of small water systems in urban areas, and income levels are substantially higher in urban areas then they are in rural areas. As a result, rural households tend to spend a higher percentage of their income on utilities and other necessities than do urban households. In fact, the typical rural household tends to spend essentially all of its after-tax income, while the typical urban household tends to have a surplus of nearly $4,000 per year. (Scott R. Rubin, Economic Characteristics of Small Systems, NRWA, 2001). We also suggest that EPA develop a matrix of affordability criteria so that any system that has valid affordability concerns will not be precluded from obtaining relief because it did not qualify under a single criterion such as a national MHI target.

- *Safe and Affordable Variance Approach (SAVA) - A policy option that provides maximum public health protection*

  Recognizing that any increase in water rates for economically "sensitive subpopulations" is unaffordable and that the variance technology is always "protective of public health," EPA should list variance technologies for all applicable rules. Authority for implementing the variance technology should be retained at the state and local level. States will decide on a case-by-case basis (based on local conditions) the appropriateness of variance technology. For example, some states use their own affordability test of 1 percent of the specific communities MHI to determine "disadvantaged community" eligibility for SRF funding – which may also be appropriate for variance technology decisions.

  Education, source water protection, bottled water and "other means" should be used as a variance technology as authorized in the Safe Drinking Water Act. In some situations, communities are within the range of being protective of public health and meet the affordability criteria but cannot afford installation of expensive treatment technology. This will require EPA to determine what is "protective of public health" and the contaminant level that presents an "unreasonable risk to health" (URTH).

- *Tradeoffs*

  Some have mentioned that low-income families are already paying over 2.5 percent MHI for water. While a fraction of a percent may be paying more than 2.5 percent of MHI, this perspective misses the main point of affordability, which are tradeoffs. Yes, a small fraction of families are paying more than 2.5 percent; however, they are trading off more important expenditures (food, health, doctors, etc.), which they have more discretion over. The fact that low-income families are currently paying over 2.5 percent MHI is proof that the current procedure is flawed. Low-income families will indeed pay more for water; Rubin has shown that families will always pay for rent and water. However, families will be forced to choose between paying for medical care, food, heat, or other necessities that directly impact public health.

  Rubin's studies document in detail the tradeoffs that low-income families are forced to make in order to pay for higher water rates. For example, a recent study conducted for the State of Iowa Department of Human Rights reached dramatic conclusions about the tradeoffs that low-income households must make in order to pay their utility bills (Mercier, Joyce M., Cletus R. Mercier, and Susan Collins, *Iowa's Cold Winters: LIHEAP Recipient Perspective* (Iowa Dept. of Human Rights, 2000)). That study concluded that, in order to pay their home-heating bill, low-income households made the following tradeoffs: over 12 percent went without food at some point during the month, more than 20 percent went without

necessary medical care (failed to see a doctor when sick, failed to fill prescriptions for medicine, failing to take the full dosage of a prescription so it would last longer), nearly 10 percent were unable to pay their mortgage or rent, risking foreclosure or eviction, and almost 30 percent did not pay other bills or incurred debt to pay the heating bill. A researcher who has studied the problem for the U.S. Census Bureau concluded that one-third of households with incomes below $10,000 per year were unable to meet at least one basic need (rent, utilities, food, medical care). In a later study, the same researcher concluded, "about 1 person in 5 lived in a household that had difficulty meeting at least basic needs. These included households that didn't pay utility bills, didn't pay mortgage or rent, needed to see the doctor or dentist but didn't go, had telephone or utility service shut off, were evicted, didn't get enough to eat, or otherwise didn't meet essential expenses."

During the proceedings of this panel, PBS, the New York Times, National Public Radio, and 60 Minutes all did exposés on the plight of low-income populations in the U.S. These features covered the reality of the difficulty of these economically sensitive subpopulations to afford housing, food, medical care, and obtaining employment. They also brought to light real people and families in dire economic situations. The documentaries highlighted increasing rates of unemployment in minority populations, housing expenses increasing at uncontrollable rates, and families avoiding medical care to pay for other expenses necessary for survival.

- *The Politics of Variance Technology*

Small low-income communities do not understand why the panel does not recognize the fact that millions of families can't afford one or more $400/year increases in their water rates? NRWA is concerned that the panel did not acknowledge a realistic affordability level because it would require EPA to determine a variance technology policy, which incidentally is the Congressionally prescribed solution to unaffordable EPA rules. Some panelists argued that variance technology allows for higher concentrations of contaminants in drinking water, and therefore results in lower safety of drinking water, and that states can't implement variance technology. We believe these arguments are "red herrings."

We believe that the granting of variances should be embraced and used as widely as possible, to provide the greatest potential for public protection in low-income and rural households. As Scott Rubin 's research revealed, cost is a function of, and arguably the most critical component of, public health protection for low-income households. Since every variance is de facto: (1) protective of public health; and (2) a cost savings to low-income families, the more variances granted, the greater the over-all public health. Before any variance technology is identified, EPA must conclude that the variance technology is "protective of public health." Who could credibly argue that 10.1 ppb of arsenic is unsafe, while 10.0 ppb is safe? Even under the most legally liberal federal policy of granting variances, local and state oversight still exists. States may use the EPA authorization of

variance technology at their discretion; there is no right to install the EPA-identified variance technology. Also, a state must determine that each variance ensures "adequate protection of human health." If anything, this bureaucratic hurdle is already too burdensome. More importantly, every community has the choice of whether or not to install the variance technology. Limiting the use of variance technology, through administrative actions, increases the potential for overriding a local population's own decision on how best to utilize their limited resources. Maximizing public health protection means allocating limited public health resources in the most effective manner.

State agency representatives and others have expressed opposition to utilization of the variance provisions because of the complexity and, in their opinion, the potential for the creation of a two-tiered standard setting program. On the other hand, small communities do not believe EPA nor states can decide which provisions of the SDWA to implement and which to not. Under the SDWA, EPA is required to exploit the small systems' variance provisions when triggered by mandated EPA determination (i.e., affordability). Congress has already spoken on this issue, and has overwhelmingly agreed that EPA must implement a small system treatment variance program consistent with the Act.

Can EPA identify a drinking water standard above the MCL that is protective of public health (PPH) or an unreasonable risk to health (URTH)? That is what the law requires; however, it has not been adequately implemented. For example, in March, EPA did not find that arsenic concentrations above their standard necessarily present an "unreasonable risk to health (URTH)." Instead of identifying the levels of arsenic that are "protective of public health" as contemplated by the variance technology provision in the Act, EPA creatively chose to identify what these levels are not. "EPA is… determining what does not pose an unreasonable risk to health with respect to arsenic, rather than addressing the much more complex issue of what does constitute an unreasonable risk to health." Does this make sense? EPA cannot say what "is" a health risk, only what is "not" a health risk. If EPA cannot determine PPH or URTH, we should know that.

EPA should identify what constitutes PPH and URTH as contemplated by the SDWA for all contaminants or provide a clear definition of principle for determining such levels.

We understand the concern of those who do not wish to go down the road of a variance technology, which requires a wholly new and separate cost benefit analysis using a mixture of URTH, PPH, and affordability. It would be complex and politically risky. Also, it could result in a conundrum. For example, if EPA declared that 10.1 ppb of arsenic presented no unreasonable risk to health and allowed small communities with affordability problems to utilize "other means" that supplied water greater than the MCL it may be politically difficult to argue the 10.0 standard is necessary for larger, more affluent, systems. However, the answer

is not to shut the door on variance technology; because, it denies a solution for low-income populations, forces them into harmful tradeoffs, and small system variances are required by law.

- *Environmental Justice*

  Some have argued that variance technology presents an environmental justice issue (poorer communities receiving less public health assistance than richer communities). However, this argument neglects the reality that cost per family is a function of public health. The main environmental justice issue is EPA's overly high 2.5 percent MHI affordability level. Again, if we can conclude anything from Scott Rubin's research, it is that cost is a function of, and, arguably, the most critical component of, public health protection. EPA has stated that the purpose of its affordability determination is to "look across all the households in a given size category of systems and determine what is affordable to the typical, or middle of the road household." [FR 6975-7066] EPA's MHI standard does not adequately consider the quantity, concentration, and financial abilities of low-income families or disadvantaged communities; EPA did not take into consideration the ability of low-income and rural populations to afford the rule as required by the Agency's Environmental Justice policy. [Executive Order 12898].

- *Alternative Approaches*

  The scope or mission of the panel includes the objective to find "alternative approaches to those used to-date by the Agency." The panel lists numerous recommendations under this category including new polices on rate structures, consolidation, funding programs, changes to federal programs, state programs, roles for private systems, etc. It is presumptuous to consider additional federal authorities (that Congress chose not to authorize in their 1996 review of the Act) to address small community affordability problems without an initial determination that the SDWA is incapable of working in small and/or low-income communities. Under the Safe Drinking Water Act, Congress set the nation's drinking water policy, and directed EPA to deal with poor and small communities' affordability problems by implementing cost-benefit, variance technology, affordability determinations, exemptions, funding and other provisions authorized in the Act. We don't see this panel or EPA with the authority to trump, rewrite, or limit implementing what Congress has directed in the Act.

- *Consolidation Policy*

  EPA's authority to form consolidation policy is limited under the SDWA to the provisions in the SRF, enforcement, and variance sections. Policy recommendations outside the limited federal scope should be resisted. NRWA supports consolidation when it will result in the greatest public health protection for the consumers. We believe this is what EPA Assistant Administrator Tracy Mehan envisioned when he coined the term "appropriate consolidation."

However, many consolidation polices do not result in the greatest public health protection of consumers, but, rather, result in other objectives such as: (1) decreasing the number of drinking water systems in the country so that the regulatory burden is decreased; or (2) eliminating the universe of systems that are not considered "viable" by some arbitrary standard. The latter objective leaves many of the poorest families with public drinking water that may be better than no access to public water, but not as good as the system considered viable; it limits incremental public health improvements for systems below the "viable" standard by eliminating that public water supply.

Under the small system variance section, a state retains full discretion to determine if a system should be consolidated before it is granted a variance, so there is neither authority nor need for EPA policy. Small communities support a common-sense consolidation policy (i.e., consolidate when doing so would result in the greatest public health protection). In other words, if a system is out of compliance and the rule is determined unaffordable, the system should be allowed to choose the more economical option (either the variance technology or consolidation). Both options ensure equal public health protection because implantation of the most economical solution ensures that the extra funds will be retained for needs necessary for survival (e.g., health care, food, etc).

- *Consolidation and Limiting Local Choice*

Communities will choose to consolidate when it is in their self-interest (when it makes economic sense). Rural Water has assisted and promoted consolidation of hundreds of water systems when it made sense and had local support. We are aware that EPA continues to study and analyze "barriers to consolidation" and other issues. EPA and other organizations continually study this theory, but rarely do they consider the perspective of local citizens or communities when they make their conclusions.

The NDWAC panel report recommends that consolidation is "probably the most effective long-term compliance option for small systems…This approach is being increasingly implemented to achieve cost reduction and greater water management expertise." This statement leads NRWA to believe that the panel assumes consolidation, as a rule, results in cheaper water service because economies of scale are realized. The report calls for new consolidation initiatives at the state, local, and federal level. The reality of consolidation is that in **certain** instances consolidation results in cheaper water service and in other instances it results in more expensive water service. The report, at best, glosses over and, at worst, omits this very important concept.

Small communities do not resist consolidation when it is in their best interest. Local governments can, and will, act on behalf of their own self-interest; this was not recognized by the panel. For example, the panel finds that, "while Federal and

State policies have increasingly emphasized the benefit of consolidation, significant political, geographical and business barriers have prevented widespread consolidation." This idea has been raised for years without evidence. We continually ask for the list of communities that would be better off if they consolidated but are unwilling. No such empirical evidence is presented in this report nor have we ever seen such evidence.

The private water industry and the environmental community have long supported consolidation incentives. In some cases, consolidation incentives put into law can create unfair legal structures favoring privatization. For example, in the 1996 Act, a system that consolidates may avoid some civil enforcement fines. However, no such avoidance of fines exists if a system chooses to comply through some other means like treatment or new source water. It is unfair to allow only one compliance option when it is not necessarily the most economical.

Small communities support retaining all local government authority over consolidation, cooperation, and restructuring decisions. This assures the best possible decisions for the local citizens. Considering all the complexity of determining local public health policy (cost, benefits, tradeoffs, etc.), there is no better mechanism for determining the best local public health policy than the local citizens' choice.

- *Dual Standards*

The NDWAC panel misleadingly reports that variance technologies are not protective of public health. For example the report states that, "variance technology does not result in water quality that meets EPA standards," and "more water systems will be permitted to operate with water that does not meet the desired EPA MCL national standard and the double standard issue will be exacerbated." The SDWA does not include a provision for a "desired" MCL - it authorizes regulations that include MCLs and small system variances technology - and does not value one method of compliance over another. Furthermore, under the Act, using variance technology is part of the "national standard." The report's so called "dual standard issue" is something contrived. Both the MCL level and the protection of public health level are safe. Variance technology is just an option to comply with the regulations not a separate standard. It makes even more sense considering that the MCL is not based on public health or safety, but based on "feasibility" (or affordability) of large water systems. Similarly, Congress has provided small systems with a method of compliance - small system variance technologies and other means - which is NOT a dual standard. Furthermore, variances provide the most public health protection possible and must be reviewed periodically until affordable technology can be identified.

- *LIWAP and Federal Funding to Individual Households*

  NRWA does not support the recommendation for a LIWAP program or a new water tax. Major problems with the suggested approach include difficulty making the program work in very small communities: the need for major legislative reform; significant new monies to fund the program; and the fact that funding for this program would compete with drinking water initiatives and other funding priorities.

  A water tax does not solve the problem of keeping EPA's rules affordable and workable. More appropriately, EPA should move in the direction of advocating more consumer choice of water quality and water rates. A water tax removes more discretion and choice from the local level about how to use their limited resources. Local governments (water and wastewater systems) are owned and operated by the local citizens – the people that we are trying to protect. They are the branch of government most responsive to and most representative of the will of the public. By their very nature, they strive to take every possible action to protect consumers -- themselves. However, every small community faces unlimited challenges and needs, with limited financial, administrative, and technical resources. They also need to ensure these resources are most effectively allocated to the most pressing needs.

  Further, the law regulates communities, not individuals. Federal funding programs designed to assist with safe drinking water (SDWA) should retain the emphasis on providing funds to the entity they regulate (i.e., community/water systems). This retains the traditional federal/state/local governing structure, which has all sorts of checks and balance mechanisms. This should not be eroded. Local governments initiated their drinking water system without mandates, and are interested in continuing as the primary source for community welfare with regard to drinking water.

  Principally, taxpayer subsidies should be prohibited from large profit generating companies or companies paying profits for shareholders/investors. Such subsidies should be reserved for identified social and welfare objectives. We believe that the distinction in mission between public and private (maximizing profit vs. providing for public welfare) is the core principal that should be recognized in funding programs designed to assist communities with drinking water safety. While maximizing profit is a noble virtue and as "American" as safe water, we do not think that taxpayers should help the cause of large privately owned systems.

- *Changing or Re-prioritizing Local, State and Federal Programs*

  Small communities are not convinced that local and state government are administering ineffective programs and need new oversight or redirection of their polices. The report concludes "new and expanded State leadership is essential to promote cooperation among small systems." How can the panel make this

conclusion without first identifying a state that is not fully taking an adequate leadership role over its communities? No states have been identified in the report.

The panel has supported major policy initiatives based on vague evidence of the need for such changes. For example the report recommends "all options that achieve full regulatory compliance need to be considered prior to and during the small system variance process." We assume this is a recommendation that something new is needed, however, we are not sure just what is needed and by whom. Further, it is not clear what "full" regulatory compliance means versus "compliance."

The panel report also concludes that, "since cooperative efforts are very effective in helping small system affordability problems, a larger share of loan and grant (principal and interest forgiveness) portions of the DWSRF should go toward supporting these cooperative efforts." We have not seen the evidence that cooperative efforts are "very effective" to the point that the state government's current use of the SRF funding needs to be changed. Also, this recommendation allows for "cooperative effort" to trump public health in awarding funding. We strongly believe that public health should be the priority of SRF funding and not be second to cooperative efforts. If cooperative efforts result in the most public health improvement, they should qualify, but priorities in distributing money should be clear and based on public health merit. This is presently the policy in all 50 states, and does not need to be changed.

While we agreed to the importance of existing education principle requirements, we are concerned about the vagaries of words like "meaningful."

- *Meaningful local public education and local public participation effort*
- *Meaningful review for the system applying for a variance*
- *Meaningful incentives for assessing whether cooperative efforts are feasible*

We do not support more or new federal oversight but rather support retaining all current state and local authority.

The panel recommends the "expanded use of the private sector and large central utilities" to assist in the solution to affordability. However what is "expanded use."

Much of the terminology used in the panel's report is largely subjective and will likely
have widely varying meanings in the future. We see no agreement on the meaning of these terms and see them as problematic, especially if they are interpreted to have some recommendation for legal policy.

The Work Group recommends that the "USDA's water program and 7 U.S.C. 1926 (b) should not be modified to be similar to EPA's programs." This would be a

disservice to low-income rural populations trying to improve drinking water quality. We have not seen any problematic conflict between the mission of EPA and USDA. If anything, USDA has a more effective program in advancing public health because their mission is more focused on "assisting" rural low-income populations and basic public health, versus EPA's focus on "enforcing" compliance with the regulatory requirements.

- *Consideration of Dual Standards*

The Work Group should have given more consideration to the use and EPA application of dual standards. EPA has routinely excluded certain categories of public water systems from having to comply with NPDWRs. These examples, while resulting in different outcomes all serve to illustrate examples of dual standards. Some cases result in outright exclusion from regulation; in others, differentially applying the regulation or imposing different regulatory requirements clearly documents that today's implementation of the SDWA involves a system of dual standards. Existing cases of dual standards include:

- **Trihalomethanes** - EPA concluded that small system resources would best be spent on maintaining and improving microbiological quality and safety rather than imposing regulatory requirements to reduce TTHM levels. EPA established two different standards based solely on system size, for a substance that was considered to present a carcinogenic risk.

- **The 1998 Revised TTHM Standard as Part of the DBP Rule** - The revised TTHM standard was promulgated in 1998 as part of the Disinfection By-Products Rule (DBP) which lowered the TTHM MCL to 0.08 mg/L and applied to both community and non-community water systems of all sizes. [63 Fed. Reg. 69390, 69465; December 16, 1998] However, systems serving more than 10,000 people had a compliance deadline of December 31, 2001; for those serving fewer than 10,000 people, the compliance deadline is no later than December 31, 2003. [40 CFR 141.64(b)] Thus, a dual standard for TTHM remains in effect until the end of 2003.

- **Synthetic Organic Chemicals Rules** - In the final SOC rule, EPA decided to impose the SOC regulatory requirements to a subset of the previously excluded class of non-community water systems, but to continue to exclude non-community systems, that served transient populations such as campgrounds, parks and gas stations.

- **Lead and Copper** - The lead and copper rule represents another instance where EPA elected to exclude coverage from transient non-community systems.

- **Radon** - In 1999, EPA proposed the NPDWR for radon and to apply this new contaminant standard only to CWSs. [64 Fed. Reg. 59246, 59255; November

2, 1999] As already noted, EPA justified its decision to exclude these systems by relying on Congress' objective in passing the 1996 Amendments – "to focus regulations on the most significant problem." EPA decided to exclude the TNCWS

- **Radionuclides** - EPA expressed a desire to rely on §1412(b)(6)(A) to exclude from the radionuclides rule, NTNCWSs because of the disparity between their specific costs and benefits. EPA estimated that the cost per cancer case avoided by regulating NCNTWSs would greatly exceed one hundred million dollars, well above the Agency's historical cost cut-offs for regulation, therefore, EPA elected not to regulate NTNCWSs.

- **Arsenic** - EPA's arsenic standard undertook a risk analysis very similar to the one performed on radionuclides but in this case came to a different conclusion. In its June 22, 2000 proposal, EPA proposed not to extend coverage to NTNCWSs and concluded, based on its analysis of the quantified benefits of bladder cancer reduction from lowered exposure to arsenic in drinking water, that "regulation of arsenic in NTNCWSs provides only very limited opportunity for national risk reduction." By the time it promulgated the final arsenic rule in January 2001, EPA had changed its mind.

Given the overall thrust of the 1996 Amendments to provide EPA with greater latitude in prioritizing regulation and in fashioning individual rules to maximize health benefits while being sensitive to costs, it is understandable that EPA has continued its past practice of chiseling out categories of water systems where it is able to make a considered judgment that regulation will not provide cost-effective benefits. It follows that if EPA has the authority to apply only certain portions of a regulation to a category of water systems, or more significantly outright exclude a category of water systems from coverage, then issuing variances for unaffordable regulations is in the Agencies best interest to promote the most effective increase in public health protection.

3.0 Conclusion

When valuing the merits of this report and its recommendations, it is important to remember that NRWA is the only member of the panel that represents small communities and their customers (or citizens) democratic voice. We represent over 22,000 communities and their local governing structure. No other organization on the NDWAC affordability panel is directly accountable to small communities or their customers. Private water systems that "sell" water to people for a profit do not represent local communities, no more than any other community business. The broad range of interests that have participated on the panel have offered some helpful advice in their subject matter areas of expertise, but do not necessarily always represent the needs of the local community. This must be remembered when considering terminology of "minority" and "majority" positions in the final NDWAC report, and issues of paternalism. This report represents a consensus among the highest percentage of small communities (over 50 percent of small communities across the U.S.).

In 1996, Congress envisioned a new law with provisions to assist small communities as described by Senator Baucus on the Senate Floor, *"The bill provides special help to small systems that cannot afford to comply with the drinking water regulations and can benefit from technologies geared specifically to the needs of small systems. Here is how it would work. Any system serving 10,000 people or fewer may request a variance to install special small system technology identified by EPA. What this means is that if a small system cannot afford to comply with current regulations through conventional treatment, the system can comply with the act by installing affordable small system technology"* There are thousands of such communities in the U.S.; to date, EPA has not allowed any one of them the opportunity to use variance technology. If Congress' prescribed solution to the affordability problem is unworkable because EPA can't determine variance technology policy ("reasonable" affordability standards, contaminant concentrations that are protective of public health, and alternative variance treatment methods) then this should be clearly stated and reported to Congress. Until such time that Congress determines they need to rewrite the Act, we should assume they meant what they passed in 1996.

Additional Comments filed by Councilmember Makia Epie Cedar Hill, Texas

On behalf of the National League of Cities I found it necessary to vote against the recommendation of the Work Group to enact a Low Income Water Assistance Program and abstain from supporting the recommended changes to the Drinking Water State Revolving Fund (DWSRF) allocation formula.

Support for Enactment of a LIWAP

In principal, it is very likely that the NLC membership would support a proposal to provide assistance to low-income households for water and sewer services if funding for the assistance comes from sources other than a tax on water. NLC voted "no" because we currently have no policy on this recommendation and I believe it important to secure the prior support of our members. It is necessary to make clear, however, that under no circumstances would NLC support a proposal to fund a LIWAP with a "water tax." On this matter we have very clear and unequivocal policy.

Proposed Changes to the DWSRF

The determination of allocation formulas is the ultimate in political decision making. As would be the case with any broadly based organization – and NLC represents 16,000 municipalities across the nation – formula changes would undoubtedly adversely affect as many of our members as such changes would benefit others. Furthermore, no information was presented to the work group on the impact of the proposed formula changes or even whether the recommendation would accomplish its intended objective. As an organization, we rarely engage on this issue and would prefer not to do so now either.

I appreciate the opportunity that was afforded NLC to participate in the Affordability Work Group and wish to thank the NDWAC and EPA for including us in these deliberations.

Makia Epie
Councilmember
Cedar Hill, Texas

Appendix 2
Final NDWAC Affordability Work Group Roster

National Drinking Water Advisory Council
Small Systems Affordability Work Group

Final Roster

Work Group Members

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Salt Lake City, UT

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Rural Communities Assistance Corporation
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Appendix 3
National Drinking Water Advisory Council
Ground Rules

NATIONAL DRINKING WATER ADVISORY COUNCIL
WORKING GROUP GROUND RULES

BACKGROUND: Each Working Group under the National Drinking Water Advisory Council (NDWAC) will follow the ground rules set out in this document. Federal Advisory Committee Acts (FACA) requirements allow working group members to participate fully in the discussion of a specific issue without being appointed NDWAC members. At least one member of the Council will be a part of each working group to facilitate the flow of information back to the full Council. **It must be noted that no working group can provide recommendations directly to the EPA. The recommendations of a working group must be made to the full Council at their scheduled meetings. The Council will consider the recommendations and can either pass them on as they received them, amend the recommendations to reflect their deliberations or not forward the recommendations after discussion.**

GROUND RULES:

EACH WORKING GROUP:

- Will have a mission statement.
- Will have an agenda for each meeting.
- Will set the agenda for its next meeting at the end of meeting.
- Will have balanced membership.
- Will have at least one member from the NDWAC membership as a working member**.** That member will report activities of the working group to the full Council.
- Will have an assigned EPA staff person to help coordinate meetings and provide a record of proceedings.
- May assign a facilitator to help the flow of meetings (this may or may not be the EPA staff assigned to the group).
- Will advise the full Council, not EPA**.** Therefore, all recommendations must first go to the full Council.
- Will give sufficient notice of meetings to the public and Council members, following the requirements set forth in the GSA Regulation on FACA meeting notices (15 days prior to meeting).
- Will provide equal rights to each member, holding one vote per assigned member.
- Work group members will attend all meetings**.** In an emergency, members can send an alternate, but they cannot vote**.** Alternate will be a peer of the member**.** In an emergency situation, an Association staff member may sit in, but this will be allowed only once throughout the duration of the working group**.** Notification to the DFO should be made as soon as possible.
- Will allow any group member to file a minority report.
- All Council members will receive agenda and summaries of each working group meeting.

Appendix 4
Operating Protocols of the NDWAC Affordability Work Group

National Drinking Water Advisory Council
Work Group on National Small Systems
Affordability Criteria

Final Operational Protocols

1. MISSION

The purpose of the National Drinking Water Advisory Council (NDWAC) Work Group on National Small System Affordability Criteria is to:

Provide advice to the NDWAC as it develops recommendations for the U.S. Environmental Protection Agency (EPA) on National Small Systems Affordability Criteria as required under the Safe Drinking Water Act (SDWA). In particular the Work Group will make recommendations on:

- the Agency's national level affordability criteria, the methodology used to derive the criteria and the approach to applying these criteria to national primary drinking water regulations;
- alternative approaches to those used to-date by the Agency; and
- the role of alternate strategies – including funding mechanisms and possible legislative actions – that would enable small systems to achieve and maintain current and future compliance.

In addition, the Work Group will explore barriers and opportunities for small system compliance and make recommendations that relate to the overall charge. In developing these recommendations, Work Group members will need to bear in mind the structure of the Safe Drinking Water Act and the limitations of readily available data and information sources.

2. PARTICIPANTS

a. Representation. Work Group individuals were selected based on the expertise and experience needed to provide balanced advice to the NDWAC and hence to EPA on issues related to national-level small systems affordability criteria. At least three members of the NDWAC will be members of the Work Group in order to facilitate the flow of information between the Work Group and NDWAC.

b. Alternates. Work Group members are expected to participate in all meetings or conference calls to the greatest extent possible. In the event that this is impossible, any Work Group member may designate one alternate, subject to approval by the NDWAC, to participate in his or her place. The alternate must be a peer of the member, and must have similar expertise and perspective, and/or the

ability to fully represent the member. Only the Work Group member or his or her designated alternate may participate in Work Group meetings. If neither the member nor his or her designated alternate can attend, there will be no representative at the table for that particular seat. In an emergency, a representative Association member may sit in on behalf of a member (the Designated Federal Official (DFO) should be notified as soon as possible), but this will be allowed only once throughout the duration of the Work Group. Alternates cannot vote.

3. DECISION MAKING

a. Consensus. The Work Group will strive to reach consensus, where possible. Consensus is defined as "all can live with the recommendation." Work Group decisions will be made only with the concurrence of all members present at a given meeting, except for agreement on any final products delivered to the NDWAC which will require consensus of all members. If consensus cannot be reached a report will be drafted by Work Group members, assisted by the facilitator. The report will describe the issues where consensus was not reached and provide the perspective of all Work Group members who contribute material to the report. This report will be submitted to the NDWAC as part of the product delivered to the NDWAC.

EPA recognizes the complex and controversial nature of the subject matter that will be discussed by the Work Group and would not expect consensus to be reached on all issues. For areas where consensus can be reached, EPA will carefully consider such consensus recommendations. Where consensus cannot be reached, the Work Group would be expected to present the range of views expressed, along with a discussion of the potential pros and cons associated with the various alternative approaches.

b. Agreement and Product(s). Agreement of the Work Group on any written document or other product(s) of the Work Group intended for delivery to the NDWAC will be considered products of the Work Group. Pre-consensus draft materials should neither be considered nor characterized as products of the Work Group.

4. PROCEDURES

a. FACA. The Work Group is established by the NDWAC, a Federal Advisory Committee established under, and complying with, the requirements of the Federal Advisory Committee Act (FACA).

b. Notice of Open Meetings. Consistent with FACA requirements, meetings of the NDWAC Work Group will be announced in the *Federal Register* prior to each meeting (at least 15 days) and will be open to the public.

c. Meeting Summaries. Draft summaries of the Work Group meetings will be developed by the facilitator for approval by Work Group members. Meeting summaries will be made available to the public only after approval by the Work Group members. Completed meeting summaries will be loaded onto the EPA web site (www.epa.gov).

d. Agendas. Meeting agendas will be drafted by the facilitator in consultation with the NDWAC Work Group members. Agenda items will be identified at each meeting for the subsequent meeting. A draft agenda will be distributed in advance of each meeting for review by Work Group members. It will be reviewed at the beginning of each meeting and will be refined, if necessary, and approved.

e. Relationship to NDWAC. This Work Group has been formed to address specific issues (see mission statement) and to make recommendations to the NDWAC (not directly to EPA). The Work Group is not authorized to make decisions for the NDWAC. All NDWAC members will be notified of the date and time of Work Group meetings, and will be provided with agendas and written summaries for all Work Group meetings/conference calls.

f. NDWAC Receipt of Work Group Products. The recommendations or other products of the Work Group must be made to the full NDWAC at one of its scheduled meetings. The NDWAC will consider the recommendations and may either pass them on to EPA unchanged, or may amend them to reflect their own recommendations, or may, after discussion, choose not to forward them at all.

g. Facilitator. A neutral facilitator will facilitate the Work Group meetings and work with Work Group members to ensure that the process runs smoothly. The facilitator serves at the will of the Work Group, NDWAC and EPA and may be dismissed or replaced by another as determined by the Work Group, NDWAC and EPA. The role of the facilitator typically includes: developing draft agendas, focusing meeting discussions, working to resolve any impasses that may arise, preparing meeting summaries, working with Work Group members to support between-meeting activities, working with the EPA staff in locating and circulating background materials, and other appropriate functions.

h. Electronic Communication. Electronic communication mechanisms will be utilized to the greatest extent possible for the sharing of information outside of Work Group meetings, including distribution of meeting agendas and summaries. For any Work Group member who is unable to participate in electronic communication, others means of communication will be utilized (fax and hard copy mail). The purpose of electronic communications is to reduce paperwork, delay, and expense of mailing or faxing.

i. Attendance at Meetings. All Work Group members are expected to make a good faith effort to attend Work Group meetings and participate in conference calls.

j. Caucus. Any subset of Work Group members may confer privately during or after a Work Group meeting as needed. The facilitator may also confer privately with Work Group members during or after meetings.

k. Observers. Work Group meetings are open to observation by the public. Observers are any non-Work Group attendees at meetings. Only the Work Group members (or their designated alternate) will be seated at the table and participate in discussions unless the facilitator acknowledges an observer.

l. Committees. The Work Group may establish committees to assist it in carrying out its mission. Committees may consist both of individuals who are members of the Work Group ("decision-making members") and individuals who are not ("guest members"). Only those committee members who are also members of the Work Group will participate in committee decision-making. The committees shall strive to operate by consensus in generating recommendations or advice to the full Work Group. Should consensus not be forthcoming, the committee may produce majority and minority reports; guest members may submit or contribute to such reports.

Committees may decide to recruit additional individuals to join the committee if deemed necessary for carrying out the committee's mission by a majority of the decision-making committee members participating in the committee meeting or conference call where the suggestion is discussed. The committee must inform the full Work Group promptly of any changes in the committee's composition.

All NDWAC members, Work Group members, and other known interested parties will be notified of conference call dates and times. Committee meetings and conference calls are open to observers, provided that the number of observers does not interfere with the work of the committee and provided that sufficient conference-call lines are available. RSVPs are requested to enable planners to obtain sufficient call-in lines. In the event that conference call lines are limited, available lines will be allotted to the following groups in priority order: committee members, including both decision-making and guest members and key staff supporting committee work; other Work Group members; NDWAC members; other interested parties.

m. Public Comment. Meeting agendas will set aside time for the specific purpose of taking public comment. Observers will be asked to indicate their interest in making public comment ahead of time on a sign-up sheet provided at each meeting for this purpose.

n. Changes to Procedural Protocols. These Procedural Protocols may be revised with the consensus of the Work Group and with approval by the NDWAC and the Designated Federal Officer.

5. SAFEGUARDS FOR THE PARTIES

a. Good Faith. All parties agree to act in good faith in all aspects of the Work Group deliberations. In order to encourage the free and open exchange of ideas, views and information prior to decisionmaking, members agree not to use specific offers, positions or statements made by another member during non-public discussions for any other purpose not previously agreed to in writing by the members involved. It is the hope that other attendees at Work Group meetings also voluntarily comply with this provision. Personal attacks and prejudiced statements will not be tolerated.

b. Right to Withdraw. Any party may withdraw from the Work Group at any time without prejudice. However, it is requested that the member wishing to withdraw communicate the reasons for withdrawal.

c. Others' Positions. Members agree not to characterize the position of any other party in public statements or in discussions with the media (even if that party withdraws from the Work Group). To the extent feasible, members will refer others to approved meeting summaries for information about the Work Group's discussions.

d. Interactions with the Press. Recognizing that the way in which Work Group discussions or the statements or positions of Work Group members are publicly characterized may affect the optimal functioning of the Work Group, wherever possible Work Group members (and their alternates) will refer inquiries from the press regarding the overall process of the Work Group and its deliberations to the facilitator(s) or to approved meeting summaries. If a Work Group member does engage in discussion with the press, he or she will refrain from characterizing the views of, or attributing comments to, other Work Group members.

6. SCHEDULE

The Work Group is expected to meet up to five times (in Washington DC) and to hold several conference calls between September 2002 and February 2003.

Appendix 5
Illustration of Two Possible Approaches for Small System Drinking Water Determinations

ILLUSTRATION OF TWO POSSIBLE APPROACHES FOR SMALL SYSTEM DRINKING WATER AFFORDABILITY DETERMINATIONS:

EPA'S CURRENT "EXPENDITURE MARGIN" APPROACH AND AN ALTERNATIVE "INCREMENTAL" APPROACH

drafted by
Bob Raucher

[This Appendix is included because it illustrates two potential approaches to making affordability determinations; the analyses and conclusions herein were not agreed to by the full committee]

revised draft of January 3, 2003

1.0 OVERVIEW OF APPROACHES

This paper provides a brief discussion and illustration of two possible approaches to determining whether regulatory actions under the SDWA should trigger a potential designation of small system variance technologies. The two approaches are (1) EPA's current approach, utilizing an "expenditure margin" concept, and (2) an "incremental" approach that examines how estimated household annual compliance costs for any future rule compare to a specified affordability threshold.

For either approach, there are multiple variations that are possible (e.g., for how to define what concepts and/or specific dollar values are useful indicators of what is "affordable"). In order to keep the discussion manageable, this paper relies on simple descriptions and illustrations of the two basic approaches. Some potential variations on each theme are offered as well. We also use rounded numbers to help keep the illustrations easy to follow.

Finally, it should be noted that this discussion of affordability is separate from the SDWA's requirement that EPA assess the benefits and costs of proposed and final drinking water regulations. It is presumed here that EPA will: (1) conduct suitable benefit-cost analyses of the regulatory options, (2) provide decision makers, stakeholders, and the public with clear presentations of the incremental costs and incremental benefits of potential MCL options, on system size basis, and (3) use the comparison of incremental net benefits in selecting a suitable Maximum Contaminant Level (MCL), in accordance with the statute.[31]

[31] It is also noted that if EPA finds a need to designate a small system variance technology -- based on using either of the affordability determination approaches discussed below -- then the Agency may need to recalculate the national benefits and costs of the rulemaking to account for a reasonable projection for how many small systems might receive a technology variance from primacy agents. It is conceivable (but unlikely) that such a recalculation of national level benefits and costs would significantly alter the level Agency selects for an MCL based on the benefit-cost findings.

1.1 EPA's Current "Expenditure Margin" Approach

The current approach used by EPA includes 4 basic elements:

1. An overall total affordability threshold that reflects a judgment of how much a median income household (in a median small water system) can or should afford to pay -- in total -- for water supply services. EPA currently defines its affordability threshold at 2.5 percent of median household income (MHI). Using round numbers, MHI is $40,000 per year, and thus EPA estimates a total affordability threshold of nearly $1,000 per household per year.

2. An expenditure baseline that is intended to reflect the baseline water supply costs borne by the median household (in the median small system). Data collected from the 1995 Community Water System Survey (CWSS) on water system revenues suggest median households pay roughly $200 per year on water -- which amounts to roughly 0.5 percent of their incomes.

The expenditure baseline is intended to be updated to reflect increases in typical household water bills over time. Updates are intended to reflect newly promulgated regulations and other requirements associated with sustainable and secure water system service provision. The recent arsenic rule, for example, would add approximately $12 per year to the expenditure baseline, based on the current EPA approach to estimating such expenditure baseline updates.[32]

3. An expenditure margin, which is simply the difference between the total affordability threshold ($1,000) and the expenditure baseline ($200). This expenditure margin is intended to reflect how much households can still afford -- above and beyond baseline (current) water bills -- and still remain below the total affordability threshold. The expenditure margin is now approximately $800 per household per year (but would decline by roughly $12 if arsenic were included in the updated baseline).

4. Estimated annual compliance costs per household for each technology designated as Best Available Technology (BAT) for a given rule. Currently, if there is one (or more) BAT that has a per household estimated cost that is less than the "expenditure margin" (i.e., under $800 per year), the rule is considered "affordable" for that small system size category.

How the current approach is applied

Step 1: The current approach compares the incremental cost of a new rule under consideration to the expenditure margin (currently about $800) to determine if the incremental cost pushes the median household (in the median system) above the total affordability threshold.

Step 2: If none of the BATs is estimated to cost less than the expenditure margin (currently $800 per year per household), then (and only then) would EPA proceed to determine whether there

[32] The current EPA approach for adding regulatory costs to the expenditure baseline entails taking the total national level compliance cost estimate (by size class) and dividing it across all Community Water Systems (CWSs) in the size category. For example, EPA expects an average small system with arsenic above the MCL (about 5 percent of the CWSs in the size class) will bear a compliance cost for arsenic on the order of $240 per household per year. Spread over 100 percent of CWSs, this translates to $12 average cost for the smallest system size class (5.0 percent * $240).

was a variance technology that exists. A variance technology exists only if it costs enough less than the BATs to be considered affordable (i.e., under $800 per year per household) and yet delivers useful contaminant reductions (sufficient contaminant reductions to provide useful health protection, although probably less removal than the BATs).

Step 3: If none of the BATs are affordable, *and* if EPA finds and designates a variance technology, then (and only then) do State primacy agents have the option to consider whether small systems in their domain may apply to use the variance technology for compliance.

Step 4: States that are willing to consider the variance technology provisions can then determine whether any systems in their domain will be granted permission to use the variance technologies, based on decision criteria of the State's choosing insofar as the decision process is in accordance with applicable laws (e.g., requiring public hearings).

1.2 An Incremental Approach

A suggested alternative to the current EPA method (of a cumulative expenditure margin) entails use of a blended approach:

- First, an *incremental* perspective would be applied at the federal level to determine whether EPA should proceed to try to identify and designate a possible variance technology for a given rulemaking.

- Second, the incremental approach would be combined with a strong recommendation that States apply a more *system-specific assessment of cumulative costs* (using an approach similar in concept to the current EPA method) to account for any system-specific circumstances that might render the incremental approach too lenient or too strict for a particular community water system (CWS).

The incremental approach includes 2 basic elements:

1. An incremental affordability threshold that reflects a judgment of how much a median income household (in a median small water system) can or should afford to pay -- for any given individual new rule -- for water supply services.

One potential incremental affordability threshold may be a given percentage of median household income, with a possible threshold value of 1.0 percent of MHI (although other variations in concepts or values can be applied, as illustrated later in this paper). The 1.0 percent of MHI threshold translates to approximately $400 per year per rule. This would imply that if a median household were to have to devote 1.0 percent or more of its annual income to cover the expense of complying with a single drinking water regulation, then that rule might not be affordable.

2. Estimated annual compliance costs per household for each technology designated as BAT for a given rule. If there is one (or more) BAT that has a per household estimated cost of under $400 per year (assuming use of the "twice current water bill" threshold), then the rule is considered "affordable" for that small system size category.

How the incremental approach might be applied

Step 1: The incremental approach entails a simple comparison of the incremental cost of a new rule under consideration to the incremental affordability threshold. Under the current illustration, the incremental affordability threshold is about $400 per rule (although other values can be selected instead, as per the illustrations provided under Sections 2.0 and 3.0, below).

The US EPA activities under this blended incremental approach are then identical to what is done under the current approach (except that the dollar-value threshold may be different, depending on how the affordability threshold is set under either approach).

Step 2: Under the current illustration, if none of the BATs is estimated to cost less than $400 per year per household, then (and only then) would EPA proceed to determine if a variance technology exists. A variance technology exists only if it costs enough less than the BATs to be considered affordable (i.e., under $400 per year per household) and yet delivers useful contaminant reductions (sufficient contaminant reductions to provide useful health protection, although probably less removal than the BATs).

Step 3: As under the current approach , if none of the BATs are affordable, *and* if EPA finds and designates a variance technology, then (and only then) do State primacy agents have the option to consider whether small systems in their domain may apply for use of the variance technology for compliance.

Step 4: If EPA has designated a variance technology, then States that are willing to consider the variance technology provisions can determine whether any systems in their domain will be granted permission to use the variance technologies, based on decision criteria of the States' choosing insofar as the decision process is in accordance to applicable laws (e.g., requiring public hearings).

An important aspect of the blended incremental option is that the Work Group would strongly encourage that State primacy agencies consider *system-specific factors* that affect how *cumulative* water bills and/or community income levels affect the State's system-level assessments for potentially granting technology variances. For example:

- A particular water system may have compliance costs that exceed $400 per household (i.e., the federal-level incremental test as applied nationally to the median system), but might not deserve a variance because of other relevant circumstances (e.g., the community is relatively affluent, and/or the baseline water costs are very low).

- Alternatively, a specific CWS may have estimated compliance costs that are moderate (i.e., less than the incremental threshold applied to the national median system and prompting EPA's specification of a variance technology), but this CWS might still be deserving of a technology variance (e.g., if the community is relatively poor, and/or if other regulations or water supply factors make baseline water costs very high).

2.0 ILLUSTRATIONS OF THE TWO BASIC APPROACHES

Simple numerical illustrations are provided below to reveal how the two approaches might work. The basic scenario has the following assumptions:

1. Median household income in the median system is $40,000 per year.

2. Baseline water cost at the median is $200 per year.

3. The least expensive BAT for contaminant X costs $401 per household per year.

2.1 EPA's Current Approach, As Is

The total affordability threshold is 2.5 percent of MHI, or roughly $1,000. The expenditure baseline is $200 per year, implying an available expenditure margin of $800 (i.e., $1,000 - $200 = $800).

Given that the cost of the least expensive BAT (which costs $401) is *less* than the available expenditure margin of $800, the rule is deemed "affordable" for small systems and no variance technology is investigated. No technology variances are available to any systems.

2.2 EPA's Current Approach, But Total Affordability Threshold Changed to 1.5 percent of MHI

The total affordability threshold is 1.5 percent of MHI, or roughly $600. The expenditure baseline is $200 per year, implying an available expenditure margin of $400 (i.e., $600 - $200 = $400).

Given that the cost of the least expensive BAT (which costs $401) is *greater* than the available expenditure margin of $400, the rule is deemed "*un*affordable" for small systems. Therefore EPA investigates less costly, less effective technologies to see if any can be classified as "affordable" (i.e., costing $400 or less per year) and still provide worthwhile contaminant reductions.

If EPA identifies and designates a variance technology, then it is up to the States to consider whether they wish to enable small systems in their domain to apply. If so, they then go through applicable procedures (including public meetings) to determine whether individual communities will be granted technology variances.

2.3 Blended Incremental Approach, with Incremental Threshold Set at 1.25 percent of MHI

The incremental affordability threshold is 1.25 percent of MHI, or roughly $500. Given that the least expensive BAT (which costs $401) is *less* expensive than the threshold, the rule is deemed "affordable" for small systems and no variance technology is investigated. No technology variances are available to any systems.

2.4 Blended Incremental Approach, with Incremental Threshold set at 1.0 percent of MHI

The incremental affordability threshold is 1.0 percent of MHI, or roughly $400. Given that the cost of the least expensive BAT (which costs $401) is *greater* than the threshold, the rule is deemed "*un*affordable" for small systems. Therefore EPA investigates less costly, less effective technologies to see if any can be classified as "affordable" (i.e., costing $400 or less per year) and still provide worthwhile contaminant reductions.

If EPA identifies and designates a variance technology, then it is up to the States to consider if they wish to enable small systems in their domain to apply. If so, they then go through applicable procedures (including public meetings) to determine whether individual communities will be granted technology variances.

Under the blended approach, States would be strongly encouraged to consider several system-specific factors -- including cumulative effects of multiple regulations, and community income levels -- in determining whether or not a particular small system applying for a technology variance should be granted one.[33] The recommended approach would encourage States to use the cumulative impact approach embodied in EPA's current approach, but to apply it using the State's knowledge of system-level circumstances (rather than based on national median values or the diluted average costs of compliance with other regulations).

For example:

- A small system may have estimated compliance costs of less than the $400 per year used by EPA as its incremental affordability threshold, but that system might still be considered deserving of a variance if:
    - Baseline costs were notably above the $200 baseline that EPA estimated for the median national system (e.g., because of the impacts of multiple regulations on that particular CWS), or
    - Other factors exist that result in high baseline water service costs (e.g., expensive water rights), or
    - Median household income was well below the national median of $40,000.
- Likewise a system with an incremental per-household regulatory compliance cost higher than EPA's $400 estimate might *not* be found deserving of a technology variance if, for example:
    - The median income was above the national median level, and/or
    - Baseline costs were well below the national estimated median of $200 per household, and/or

[33] The state also should take into consideration practical opportunities for feasible consolidation and ensure that there is full opportunity for public education, discussion, and an informed community decision regarding the possible variance.

- Through public education and discourse, most community members expressed strong interest in forgoing the variance and instead wished to meet the MCL.

3.0 VARIATIONS ON THE TWO BASIC APPROACHES

Either of the two basic approaches outlined above can be modified using alternative definitions, data, and/or concepts for "affordability." Ultimately, these choices affect the dollar thresholds and likelihood that the variance technology provision might become applicable for a given rulemaking.

3.1 Variations on the Current EPA Approach

Numerous variations are possible to the current approach. Many of the options are embodied in the charge questions provided by EPA. For each of the 4 basic elements defined above, there are variations under consideration. For example:

1. For the total affordability threshold, key alternatives revolve around whether 2.5 percent of MHI is justified and appropriate -- why not 1.5 percent of MHI or 3.5 percent of MHI? Additional variations revolve around the questions of why use *median* household income (as opposed to the 25th percentile household), or why use the median water system (as opposed to a CWS with higher than average costs or lower than typical incomes)?

According to EPA's "White Paper" and staff presentations, EPA's selection of 2.5 percent of MHI is based (in large part) on estimated costs for two options EPA believes reflect willingness to pay (WTP) for averting behaviors for waterborne risk avoidance -- bottled water or point of use (POU) devices. EPA calculated a bottled water cost of $550 per year per household, and about $220 to $330 per year for POU devices (reducing its prior high end POU cost estimate downward from $500). However, the dollar amounts applied by EPA appear to be overstated for these options, especially bottled water (for which $260 appears to be a more accurate estimate).[34]

EPA selected 2.5 percent of MHI because that threshold would keep bottled water and POU "affordable" under their expenditure margin approach. If baseline water costs were up to $250 per household and bottled water might cost $550, then total water expenditures would be $800 ($250 + $550). A 2.0 percent of MHI threshold would not guarantee these approaches would fit under the cap, so 2.5 percent was selected to ensure there was ample room to find POU and bottled water "affordable" technologies.

However, using the same logic but more refined estimates of POU and bottled water costs, a total affordability threshold of 1.5 percent of MHI would provide ample room in the expenditure margin for POU or bottled water. Using 1.5 percent of MHI, the total affordability threshold is roughly $600. Subtracting an expenditure baseline of $200 (or even $250 as a higher estimate) leaves an available expenditure margin of $400 (or at least $350) -- ample room to accommodate POU or bottled water costs (which are likely to be under $300 per year).

[34] For example, Cotruvo (forthcoming) estimated from interviewing major bottled-water distributors that a typical household customer uses 5 gallons per week, for a typical annual expenditure of $260 (at $1 per gallon). EPA's calculation of $550 is based on 2 liters per day and 3 persons per household; whereas median conditions imply 1.1 L/day and 2.6 persons per household, or $262 per year, very close to the Cotruvo estimate.

Apart from the empirical questions about the cost of bottled water and POU, a more fundamental issue is that it is unclear that these expenditures predominantly reflect WTP to avert waterborne health risks (as opposed to providing users with water of better aesthetic quality, for example). In addition, other concepts might be considered as well for the basis of total affordability. Comparisons to international water bills in one such alternative. Another is looking at trade-offs low-income households may need to make if their water bills increase. If WTP for risk reductions are to be used as a benchmark, then another metric to consider are the data on what is called the "value of a statistical life" (VSL) -- a misnomer for an approach – controversial to some members -- that is intended to reflect data on trade-offs people make between statistically low-level risks of fatality and money (or time).[35]

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[35] These tradeoffs can be based on either WTP to reduce risks (e.g., by pursuing risk-reducing actions like use of seat belts, purchasing cars with air bags, deploying smoke detectors, and so forth), or willingness to accept added compensation in order to engage in higher-risk activities (typically, accepting higher wages for occupations with above average risks).

The VSL approach is not without controversy. Critics of the approach have fundamental ethical concerns about the government making decisions based upon a presumed value of human life. They also believe that the studies upon which VSL is based are outdated and biased, noting among other objections, that: (1) the studies purport to measure the value of life, generally based upon blue-collar workers' "agreement" to work at a job entailing elevated risk, when there was little or no evidence that the workers actually understood those risks; (2) many workers studied were likely vulnerable to economic duress, so their decisions were not truly reflective of the value they placed on their lives; (3) the studies do not evaluate the value people put on the lives of their children or spouses, which are likely to be higher; (4) the studies generally evaluate risk of sudden death from an accident, not a slow and painful death, accompanied by substantial dread, such as would accompany death from cancer and whose avoidance might be valued higher; (5) the studies are extremely limited in the number and types of people evaluated, and do not, for example, consider people who are likely to be willing and able to pay more for reducing risks than many blue collar workers; (6) the dollar values derived are subject to manipulation through "discounting," latency period values reductions, and use of other accounting gimmicks to reduce the presumed value of life. Finally, the critics note that many benefits are not quantifiable, including non-fatal cancers and illnesses, pain and suffering, and other harms that cannot be captured with dollar figures.

Proponents of the VSL approach, on the other hand, note that the approach does not value life per se, but instead explores choices made by individuals with respect to decisions that reflect their attitudes and values about risk. They also note that there is a wealth of solid empirical research in the peer reviewed literature, and the methods and data are constantly being updated with newer and improved studies that tend to confirm the older results. Accordingly, the VSL concept is used routinely by EPA and other federal agencies tasked with reducing risks to health and safety, and such applications have been widely reviewed and broadly endorsed by the Science Advisory Board (SAB) and others.

An interpretation of the VSL data – as made by one Work Group member -- suggests a per household annual WTP in the neighborhood of $200 to $250 per year. This is based on a high baseline risk of 1 in 1000 risk of immediate fatality, and applying a 99 percent risk reduction. Lower dollar levels apply if one assumes lower baseline risks, or less risk reduction from the rulemakings, or if the risk is for a delayed onset premature fatality (e.g., due to latencies), or for a health endpoint less severe than immediate death.

Another Work Group member believed that even if VSL were an appropriate metric, this was a substantial underestimate. This member noted for example that the National Academy of Sciences (NAS) found that the lung and bladder cancer risks alone from arsenic at the new EPA standard of 10 ppb is actually over 3 in 1000, and at 20 ppb is about 7 in 1000. See, NAS, Natural Resources Defense Council (NRDC), *Arsenic in Drinking Water: 2001 Update*, and NAS, "New Evidence Confirms Cancer Risk From Arsenic in Drinking Water," available online at http://www4.nationalacademies.org/news.nsf/isbn/0309076293?OpenDocument. This member also noted that EPA

2. For the expenditure baseline there are options for whether (or how) to account for infrastructure needs, the impact of cumulative regulations, security upgrades, possible subsidies, and long-term system sustainability. Alternative approaches on any or all of these aspects of the expenditure baseline might affect that dollar value appreciably.

3. For compliance costs, EPA's variance technology analysis currently uses the costs estimated for a system at a relatively high influent concentration (e.g., 50 ppb for arsenic). How this value for influent conditions is selected by EPA for other contaminants is unclear (arsenic was based on the pre-existing MCL, but other forthcoming regulations may not provide such a benchmark). One alternative could be to consider an average concentration across all the CWSs expected to be above a potential MCL (this would lower compliance costs and make activation of the variance technology provisions less likely).

3.2 Variations of the Incremental Approach

The primary variation on the incremental approach pertain to how to define the incremental affordability threshold. In the illustration offered above, a threshold was based on 1.0 percent of MHI (implying an incremental affordability threshold of $400). This and other possible metrics or benchmarks to consider include:

- A fixed percent of MHI, such as 1.0 percent of MHI (which amounts to roughly $400). This metric is easy to adjust over time, as MHI data are readily available to track presumable increases in income. (If 0.75 percent of MHI is used instead of 1.0 percent, the threshold becomes $300 per year, etc.).

    - Advantages of this approach include the fact that it is simple to comprehend and easy to implement. It can be readily updated over time, using readily available data to reflect changes in median household income. Also, there is some intuitive appeal for the concept that when a median household spends more than 1 percent of its gross income on any one regulatory action, that the Agency then consider that the rule may be unaffordable and seek a variance technology.

    - The dollar value implied by the 1.0 percent of MHI benchmark (approximately $400) per year seems like a suitable target. It is less restrictive than EPA's current approach, but also would not be likely to throw the door too widely open to variance technologies. Also, the dollar amount is high enough to ensure that POU and bottled water can remain as affordable technologies for routine or variance technology compliance, respectively. Finally, the dollar amount is similar (or a bit higher than) the other useful benchmarks as described below.

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found that there would also be reductions in adverse health effects that were not quantifiable from the arsenic rule. These included many cancers (skin, kidney, nasal passages, liver, and prostate), and non-quantifiable reductions in many non-cancer effects such as cardiovascular, pulmonary, immunological, neurological, and endocrine effects. See EPA Final Arsenic NPDWR, 66 Fed. Reg. 6976, at 7012 & Table III.E-3 (January 22, 2001). None of these are considered in the VSL calculation above, this member noted, so the actual benefits of the rule are likely higher.

- Possible disadvantages of this approach include deciding what per cent of MHI to apply -- a decision that will always entail some degree of arbitrariness no matter what approach or level is selected.

- A VSL-based estimate of WTP. Variations include a pure VSL estimate (which would amount to between $200 and $250 per year, as discussed in last paragraph of footnote 5), or VSL with a "political adjustment factor" that would increase it (e.g., to about $300 to $400 per year). The VSL-based estimates provide a WTP-based benchmark for risk reductions and are well suited to incremental interpretation.

    - Advantages of this approach include the fact that it is based on a true incremental WTP-based concept for risk reduction. The VSL literature is extensive in scholarly journals, and it has been widely applied, reviewed, and accepted throughout government for environment, health and safety rule-makings.

    - Disadvantages include some controversy over the VSL concept (as articulated by some organizations), and legitimate concerns about possible shortcomings in a subset of the studies that provide a portion of the empirical data from the literature. The use of any "political adjustment factor" might be seen as arbitrary. The approach might also be seen as confusing (or a veiled attempt at replacing) the affordability provisions of the Act with the benefit-cost provisions.

    - Overall, the VSL-based approach is probably ill-advised as the *mechanism* for determining affordability. However, VSL-based information is probably well suited for providing one of several useful *benchmark dollar values* to take into consideration when applying another affordability threshold concept (e.g., the values implied by VSL are in the range of 0.5 percent to 1.0 percent of MHI).

- A "tripling of current water bills" approach, which would imply an incremental threshold value of about $400. That is, the new total bill would be $600 (three times $200), and so the increment due to the new rule would be $400 above the baseline current water bill ($600 - $200 = $400). The tripling of water bills concept is meant to reflect the "sticker shock" concept that would apply to households faced with sizable water bill increases. (An alternative variation would be a "doubling" of water bills, implying an incremental affordability threshold of $200.)

    - Advantages of this approach include its simplicity, and the political reality associated with consumer responses to sticker shock of the magnitude implied by a doubling or tripling of water bills.

    - The disadvantages include concerns about how arbitrary the approach might be, in addition to the fact that as water bills grow over time, the threshold would increase even more rapidly (e.g., if baseline water bills went from $200 to $300 because of rules and/or other factors over time, then the tripling concept would push the incremental threshold from a current level near $400 up to $600).

- Overall, the tripling of water bills approach is probably ill-advised as the *mechanism* for determining affordability. However, water bill-related sticker shock information is probably well suited for providing one of several useful *benchmark dollar values* to take into consideration when applying another affordability threshold concept (e.g., the value implied by water bill tripling is approximately the same value as 1.0 percent of MHI).

- A bottled water or POU-based cost of averting behavior for waterborne risks. This would imply a cost of about $220 to $330 per year -- based on a suitable update to EPA's initial bottled water cost estimate -- as an increment above what households pay for tap water services.

    - Advantages of this approach are that it may reflect an averting behavior-based estimate of WTP for reducing water-related risks.

    - Disadvantages of this approach are that it is unclear that POU or bottled-water purchases are primarily made for water safety reasons (survey data indicate aesthetics are typically more important in the purchase decision). Further, the data are for those households who do make these purchases, and may not reflect typical consumer choices made by median or lower income households. Also, any such purchases that are made for health and safety purposes may reflect a total rather than an incremental WTP.

    - Overall, the bottled water and POU purchase cost approach is probably ill-advised as the *mechanism* for determining affordability. However, empirical information is probably well suited for providing one of several useful *benchmark dollar values* to take into consideration when applying another affordability threshold concept (e.g., the value implied by a typical purchase is roughly the same as 0.5 percent to 0.9 percent of MHI).

      Also, use of a 1.0 percent MHI threshold would keep POU and bottled water alternatives "affordable" so that they may be considered suitable technologies for routine or variance compliance, respectively (i.e., POU as potential BAT, bottled water as potential variance technology).

3.3 Potential Options to Adjust or Update the Incremental Threshold Over Time

Some Work Group members were interested in whether the affordability threshold (regardless of approach) should be updated over time, and/or tailored in some fashion for each specific rulemaking.

Appendix 6
American Water Works Association Manual M1: *Principles of Water Rates, Fees, and Charges* (fifth ed.), Chapter 16: Low-Income Affordability Rates

AWWA MANUAL M1

Chapter 16

Low-Income Affordability Rates

GENERAL CONSIDERATIONS

If the cost of water or wastewater service grows to a significant portion of a household's disposable income, then the customer will have difficulty paying the bill. Customers with limited resources often must choose which bill to pay first. Because water is a necessity, permanently discontinuing service is not feasible.

Large and rapid increases in water and wastewater bills are perhaps the most difficult expenses for low-income families. Less-affluent households have less flexibility in their budgets to absorb water bill increases. Because there are no real substitutes for potable water, customers cannot choose lower priced alternatives.

Appropriately designed programs oriented toward affordability issues (lifeline and lower income) help both the targeted customers and the utility. When customers have trouble paying utility bills, the cost to the utility is manifested in increased arrearages, late payments, disconnection notices, and service terminations. The associated increased collection costs and bad debt write-offs increase all other customers' bills.

Increased nonpayment and bad debt write-off is also a concern to potential purchasers of a utility's bonds—particularly revenue bonds. As bad debt increases, costs to other ratepayers rise, creating concern about the affordability of water service to all customers. Security for the bonds (the revenue stream) may be brought into question, perhaps ultimately increasing the utility's cost of borrowing.

Common Affordability Programs

Affordability programs are intended to provide water to customers who are less able to pay for service. Lifeline rates are often thought of as providing a minimal amount of water at a reduced cost to all customers, independent of income level or ability to pay.

As discussed in this chapter, all forms of low-income affordability rate alternatives are targeted only to those who are defined by specific criteria as requiring assistance.

A number of different programs implemented across the country provide rate assistance to customers. These programs target low-income customers and should not be made available to all customers. Participants may be required to provide some form of income verification.

Affordable rate alternatives are typically developed as part of a larger program. These programs frequently include such strategies as arrearage forgiveness and budget billing. Water rate affordability programs can include the following:

Straight discount. A straight discount involves an across-the-board reduction or discount on the total water bill. The discount can be a set percentage for all eligible customers, vary by income level with larger discounts for more impoverished customers, or can be discounted for total amounts of the water bill over some set level.

Discount variable (usage) portion. Rather than discounting the entire bill, only the portion based on use is discounted. The fixed portion of the bill is left untouched. This method provides greater dollar discounts to customers that use greater amounts of water, thus may be most helpful to larger families that require more water. Under this program, the water rate is reduced for eligible customers. The program can also be modified to provide discounts only for use up to a certain level per month or up to a specified use per family member. This would reduce wasteful use by providing no discount for excessive consumption.

Discount fixed (minimum) portion. Another alternative is to discount only the fixed portion of the bill, i.e., the meter charge, service charge, or demand charge. This method can provide the overall reductions that may be required to make service affordable yet maintain incentives to conserve. By charging normal, rather than discounted rates for water use, there is no incentive to waste discount-priced water.

Percentage of income. A percentage of income plan usually involves a system that charges customers for service based on a percentage of their individual income. This can include a system where customers always pay a predetermined percentage of income that is considered affordable. An alternative to this is a system where a percentage of a typical bill is determined based on the income level. That percentage is then applied to all bills (similar to a discount program). If customers use more water, the bill increases; if they conserve, they save even more.

Fixed credits. In situations where assistance is provided to water consumers who may not be direct customers (e.g., renters living in a master-metered building), credits can be provided. If the utility provides another service directly to customers, such as electric service, credits can be provided on the electric bill. Another suggested form of credit is providing script or coupons used to make rent payments to landlords who, in turn, can use these coupons to pay a portion of the water bill for the building.

HISTORICAL PERSPECTIVES

Costs for other utility services, such as gas, electricity, and telephone, have traditionally been much higher than water service. Many of these utilities have already faced the issues of affordability. Nearly every state regulatory commission has addressed the issue of affordable energy bills and the ability of low-income customers to pay those bills. Low-income discounts, consumer assistance programs, budget billing, waivers of customer charges, and lifeline rates are common in the energy industry.

Outside North America, low-income discounts, lifeline rates, and affordable water programs are common. For example, through various lending agencies, the US

government provides assistance to less affluent countries to make water service available at more affordable prices. Within North America, an increasing number of water utilities have adopted affordability programs. It is not uncommon to find some elements of affordability rates in many major cities.

POLICY ISSUES

Low-income affordability alternatives are intended to address social issues, and utility involvement in such issues may be controversial. Although each utility needs to decide whether or not it will participate in such programs, an increasing number of utilities are addressing water affordability in their rates.

These types of rate alternatives should be considered when a utility's cost of water is high and some customers have problems paying their bill. Indications of this scenario can include rising arrearages, higher collection costs, and more frequent shutoffs for nonpayment. In making this determination, the cost-of-service analysis should be done first without any affordability considerations. During the rate design portion of the analysis, affordability considerations can be taken into account. The rate analyst then can measure the effects of affordability alternatives and better quantify any discounts and subsidies involved.

Low-income rates typically require some degree of subsidy. The question of which customer groups should provide the subsidy needs to be addressed. Utilities should recognize that adopting more affordable rates can reduce the utility's costs if the low-income rates result in increased collections and reduced collection costs.

The first issue to consider is at what point a water bill becomes unaffordable. While there is no clear answer to this question, the following guidelines can help utilities make such a determination:

- The Safe Drinking Water Act (S. 1547) established special assistance in communities where the average residential water bill exceeds 2 percent of median income.
- The US Department of Agriculture has a program to provide funds for water and wastewater systems. Loans are made for projects where the residential water bills are 1.5 percent of the community's median income. Grants are awarded for costs in excess of 1.5 percent.
- The AWWARF report, *Water Affordability Programs*, suggests that programs should not be based on median income but on rates that cause water bills to exceed 2 percent of income for impoverished households. Because of the focus on impoverished households, a measure of 2 percent was selected to determine if water service costs were burdensome.

Different measures of poverty can be used to determine eligibility. These include Aid to Families with Dependent Children (AFDC), Supplemental Social Security Income (SSI), minimum wage incomes, and US poverty level. Many of these measures vary with family size.

Based on the results of national water and wastewater rate surveys, bills have become unaffordable for low-income households in some of our major cities. For those living on SSI, water and wastewater bills exceeded 5 percent of income for these households in a number of cities.

Perhaps the biggest issue involved with affordable rate programs is how to determine eligibility. Utilities are often uneasy about gathering, administering, and verifying income data. Fortunately, a number of existing programs can help.

Other utilities, including many electric, gas, telephone, or cable television companies, offer discount programs based on income. Many are willing to share this data with municipal water or wastewater utilities.

A number of income-based government assistance programs are already in place. Proof of eligibility in one or more of these programs often provide adequate income verification. These programs include

- AFDC
- SSI
- LIHEAP (Low Income Home Energy Assistance Program)
- Medicaid
- Food stamps

Utilities must also decide the quantity of water to discount. If only a portion is to be discounted, it is necessary to determine a minimum sanitary level of water use. Minimum water requirements vary by family size, further complicating this analysis.

ADVANTAGES AND DISADVANTAGES

Advantages of adopting affordable rate programs include

- providing a necessity of life (water) to all customers at an affordable price
- helping to reduce utility collection costs, reduce arrearages, disconnects, and reconnects
- increasing levels of financial sufficiency for the customer and utility
- helping enhance public acceptance of water rates by making them affordable

Disadvantages of affordable water rate programs include

- being inconsistent with water conservation goals if a discount encourages wasteful use
- requiring subsidy from other ratepayers, although this is typically minimal
- creating controversy over water utility participation in social programs
- implementing and administering affordable rate programs can be costly and difficult

EXAMPLE

Two lifeline rate examples are discussed in this section—reduction to the rate for a minimum volume of use and reduction to the monthly service charge. It is assumed the minimum sanitary needs for a family is 5,000 gallons per month. The utility has also determined that 200 families with annual incomes at or below $5,000 should be eligible for special lifeline rates. Because a low eligibility level was selected, it was decided the annual water bill should be no more than 1.5 percent of the annual income. This limitation results in a maximum annual water bill of $75. Table 16-1 presents this data as well as the calculation of the water bill under current rates. A reduction of $33 per year is necessary to make water affordable to the targeted customer group.

Table 16-1 Requirements for affordable rates

Item	Quantity
Minimum sanitary use	60,000 gal/year 5,000 gal/month
Eligibility (annual income)	$5,000 maximum
Eligible customers	200
Maximum annual water bill (1.5 percent annual income)	$75 per year

Current Annual Charge	Rate, $	Use, gal	Cost, $
Consumption charge	0.9648/thous gal	60,000	57.89
Service charge	4.20	12	50.40
Total			108.29
Necessary reduction per year			33.29

Table 16-2 shows the calculation for two options to make the water bill affordable to eligible customers. Option 1 reduces the metered rate or consumption component of the bill. Because only the minimum sanitary use should be included, this reduction applies only to the first 5,000 gallons per month. Option 2 reduces the service charge component of the bill. This option provides the necessary bill reduction and still allows customers to reduce their bills through conservation.

Because affordability options reduce revenues, rates charged to other customers will have to be adjusted to recover the required revenues. Table 16-3 shows the potential revenue reduction of all eligible customers applying for the lifeline rate. The utility's projected savings in collection costs from a lifeline rate is also shown. Net costs have to be recovered through increases in the metered rates or service charges to other customers. As shown in this example, the effect is minimal.

Table 16-2 Calculation of lifeline rate options

Option 1 Reduce Consumption Charge	
Current annual consumption charge	$57.89
Reduction required	$33.29
Desired consumption revenue	$24.60
Calculation of lifeline metered rate	
Revenues desired	$24.60
Consumption, *thous gal/year*	60
Rate, *$/thous gal*	0.41

Option 2 Reduce Service Charge	
Current annual service charge	$50.40
Reduction required	$33.29
Desired service charge revenue	$17.11
Calculation of lifeline service charge	
Revenues desired	$17.11
Bills per year	12
Charge per month*	$1.43

*Charge is only applicable to customers meeting eligibility criteria.

Table 16-3 Effect on other charges

Item	
Annual revenue reduction per customer	$33.29
Customers eligible	200
Potential annual revenue loss	$8,658
Less savings in collection costs	($1,200)
Increase in other rates needed	$5,458

Blocks, *gal/month*	Current Rates, *$/thous gal*	Lifeline Rates		
		Option 1*	Option 2*	Ineligible†
First 5,000	0.9648	0.4100	0.9664	0.9664
Next 10,000	0.9648	0.9664	0.9664	0.9664
Next 1,485,000	0.8537	0.8551	0.8551	0.8551
Over 1,500,000	0.7044	0.7056	0.7056	0.7056
Service charge, *$/month*	4.20	4.21	1.43	4.21

*Charge is only applicable to customers meeting eligibility requirements.

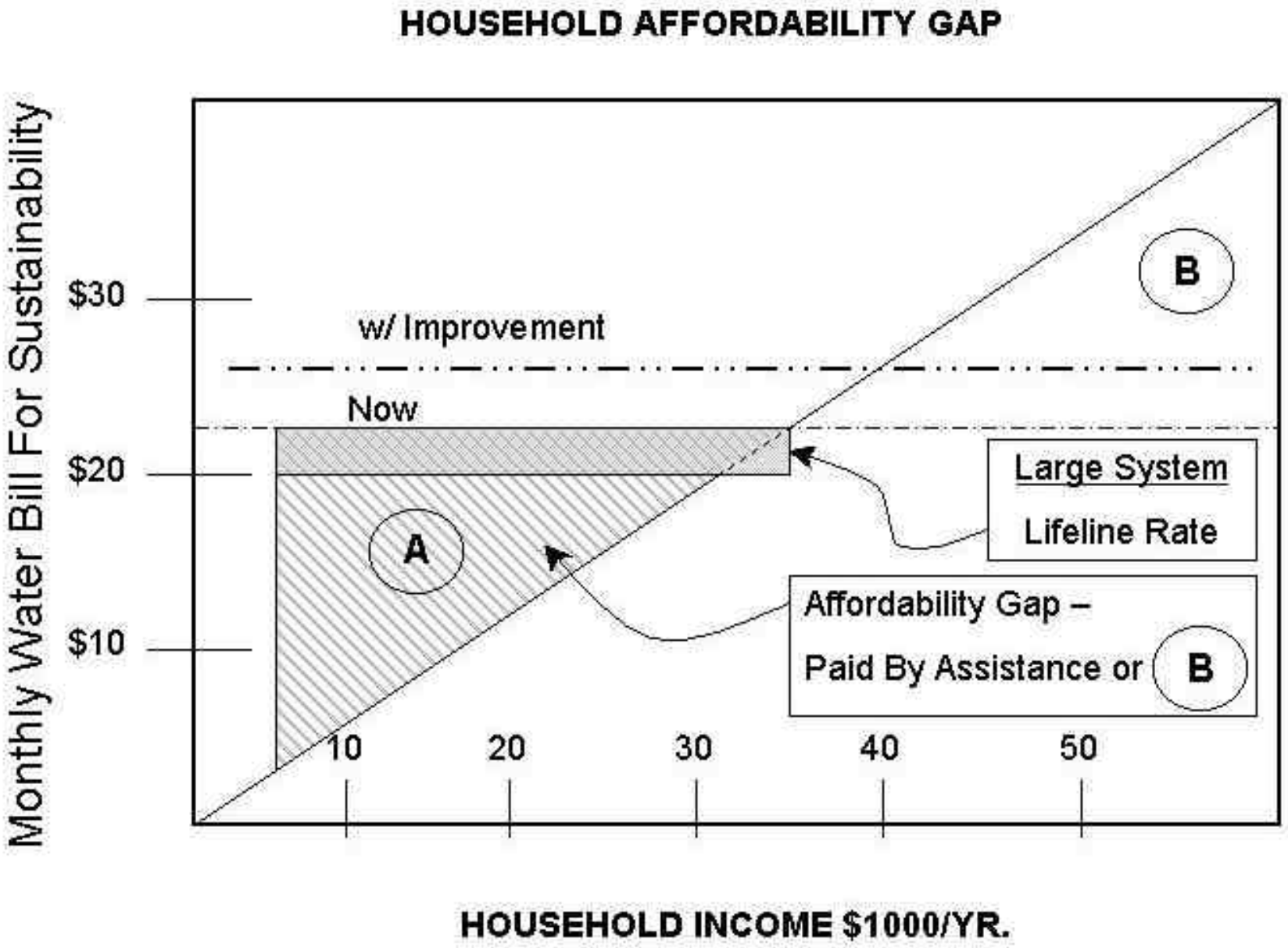
†Applicable to customers that do not meet eligibility requirements.

SUMMARY

Various affordability programs may be more widely used as the cost of water service grows relative to other goods and services and as utility costs for collections and bad debt grow. Because water is considered a necessity, utilities may determine that arrangements to provide minimal quantities to customers that cannot afford water service is a proper utility function. In developing affordability alternatives, utilities should apply rates and charges that ensure that only eligible customers receive the benefits.

Appendix 7
Gilbert's Affordability Gap Graph

– Developed by Work Group Member Jerry Gilbert –


HOUSEHOLD AFFORDABILITY GAP
Monthly Water Bill For Sustainability
$30
$20
$10
w/ Improvement
Now
B
A
Large System
Lifeline Rate
Affordability Gap –
Paid By Assistance or
B
10
20
30
40
50
HOUSEHOLD INCOME $1000/YR.