

**White Paper for National Rural Water Association on  
Assessment of  
Safe Drinking Water Act (SDWA) Requirements  
Based on Water System Size and Type**

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**0. Executive Summary**

The Safe Drinking Water Act (SDWA) is the principal law governing drinking water safety in the United States. Enacted initially in 1974, the law has been amended several times, most recently in 1996. Public water systems are regulated by the US Environmental Protection Agency (USEPA) under the SDWA.

The term “Public Water System” (PWS) is formally defined in the SDWA statute and by regulation as a system providing to the public water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year. A Community Water System (CWS) serves a year round population. A Non Transient Non Community Water System (NTNCWS) regularly supplies water to at least 25 of the same people for at least 6 months per year, but not year round, such as a factory that has its own water system. A Transient Non Community Water System (TNCWS) regularly supplies water at a location where people do not remain for long periods of time, such as a gas station or campgrounds.

USEPA classifies each water system according to its type: CWS, NTNCWS, or TNCWS. In addition, each water system is classified according to its size, as indicated by the

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number of people served. In general, “large” water systems serve 10,000 or more persons, while “small” water systems serve less than 10,000 persons.

This white paper examines the SDWA requirements and associated regulations with regard to water system type and size. An objective analysis is presented to serve as a basis for identification and discussion of small water system equity issues in the SDWA, the regulatory process, and associated regulations.

Over 30 specific provisions in the SDWA statute differ based on water system size or type. Several provisions relate to defining and listing compliance technologies for small water systems. Small water systems do not realize the same economy of scale as larger water systems. The unit cost per gallon of treated water is typically higher for small water systems. In addition, the SDWA includes variance and exemption provisions, as well as provisions for small system variances, intended to assist financially struggling communities in complying with drinking water rules. A portion (15%) of federal State revolving loan fund allotments to States is to be made available to PWSs serving fewer than 10,000 persons. Two of the fifteen members of the National Drinking Water Advisory Council (NDWAC) must be associated with small, rural Public Water Systems.

National Primary Drinking Water Regulations (NPDWRs) are set by USEPA under the authority of the SDWA. The current body of drinking water regulations is the result of over a dozen major rulemakings and many minor rule amendments promulgated since 1975. NPDWRs contain over 125 specific provisions that differ based on water system size or type.

NPDWRs represent a “multi-level” approach to risk reduction under the SDWA. Since 1987, certain regulations only apply to certain types of water systems. In addition, compliance deadlines are typically extended for small water systems. Regulations have been adopted and

implemented in an incremental, piecemeal fashion over a 30 year period as the SDWA statute has been amended. **An assessment of the cumulative impact of current regulations on small water systems (CWSs, NTNCWSs, and TNCWSs), the risk reduction effectiveness, and the resulting residual health risk is recommended to determine whether an alternative regulatory approach to the current SDWA and NPDWRs (or revisions thereof) can achieve public health protection with greater economic efficiency.** This assessment should include a re-examination of USEPA's 1987 decision to globally exclude certain water systems from certain regulatory limits, as well as consideration of expanding the current multi-tiered standard setting approach to other circumstances that represent de minimis exposures.

Drinking water regulatory limits are conservative—but are they too conservative? If drinking water standards are too conservative, then small (and large) water systems would incur costs higher than necessary to protect public health. The SDWA requires that a non-enforceable maximum contaminant level goal (MCLG) be set at a level where there is no known or anticipated adverse human health effect with a margin of safety, considering sensitive populations. The enforceable maximum contaminant level (MCL) must be set as close to the MCLG as feasible, using best technology, treatment techniques, or other means taking cost into consideration. For many small water systems the “bar” of certain regulations appears to be set too strictly with respect to their ability to pay and to comply within the statutory time limit. This has naturally resulted in questions being asked regarding the appropriateness of USEPA's drinking water standards.

USEPA has generally limited consideration of economic costs under the SDWA to whether a technology is affordable for large municipal water systems. Considering only large water system costs when determining treatment methods generally available propagates an

economic disparity that places small water systems at an economic disadvantage. **Historically, small water system costs have not been properly considered when determining methods generally available to comply with drinking water regulations.** The USEPA practice of considering only large water system treatment costs in establishing methods that are generally available is inappropriate.

The SDWA includes exemption provisions intended to provide compliance flexibility in certain cases. Exemptions are intended to provide temporary relief by giving a water system more time to comply, but granting of exemptions by regulatory agencies has reportedly been inconsistent. **Exemptions are intended under the SDWA as one component of the full range of enforcement flexibilities to be available to assist small water systems in complying with SDWA regulations.** Enforcement tools intended by the SDWA include technical assistance, variances, small system variances, exemptions, as well as formal enforcement action and compliance orders.

Existing MCLGs and MCLs have been set based on best professional judgments that incorporate precautionary assumptions and uncertainty factors. USEPA reexamined precautionary assumptions and toxicological uncertainty factors used to determine MCLs for contaminants regulated prior to 1996 and determined unreasonable risk to health (URTH) levels for most of these contaminants that are higher than the MCL (e.g., 2x, 3x, or more). **URTH values have been determined for arsenic, and should be determined for other contaminants regulated after 1996. URTH levels should be applied on a case-by-case, community-by-community basis for a defined period of time depending upon the duration of the variance or exemption.** The SDWA requires the State to provide notice and opportunity for public hearing on a compliance schedule to be included with an exemption. Therefore, consumers

would have an opportunity to comment on the acceptability of an URTH level above an MCL. Exposure considerations (e.g., setting an allowable short-term level considering the contaminant concentration and anticipated years of exposure) can also provide an appropriate basis for determining URTH levels (e.g., arsenic URTH values).

**The SDWA small system variance provision is intended to offer a more permanent form of relief (compared to exemptions) and provide compliance flexibility for small water systems. Small system variances as intended by the SDWA have been effectively implemented.** Good-faith implementation by regulatory agencies of the small system variance program as intended by the SDWA is needed. Alternatively, amendment of the SDWA will be necessary to modify or replace the small system variance program with a workable approach that can help struggling small systems comply with drinking water regulations. **Reasonable national affordability criteria is needed. However, as a practical matter, regulatory decisions to grant a small system variance should be driven primarily by local circumstances, local income levels, and local URTH determinations.**

USEPA continues to rely on Median Household Income (MHI) to measure the financial ability of communities to comply with drinking water regulations. **MHI must be supplemented with other measures that more accurately represent the percentage of households in poverty, living in poverty areas, or households in financial distress. This applies to small systems as well as large water systems that have a high percentage of households in financial distress.** State revolving loan funding or additional federal funding support alone will not solve the underlying affordability problem.

The 1996 SDWA amendments added provisions allowing point of use (POU) and point of entry (POE) treatment as a compliance technology. **Guidance is needed for small water**

**systems and State regulators on how to effectively implement POU and POE for compliance.** Case studies of positive experiences with POU and POE should be provided as a model for State regulatory agencies and small water systems.

USEPA continues to limit use of bottled water for very limited situations such as emergencies or as a temporary measure under variances and exemptions. **A study is recommended examining the feasibility of using bottled water for MCL compliance in small systems.** The study findings, if favorable, could be used to support a change in USEPA policy and/or amendment of the SDWA. If bottled water is to be used as a small system compliance technology or as “other means” to comply with an MCL, then USEPA’s current policy must be revised and/or the SDWA must be amended to designate bottled water as an acceptable means for compliance.

**Representatives of small water systems should take advantage of all opportunities to participate at each step in the rulemaking process. It is very important to submit data and reasoned arguments as persuasively as possible during the rulemaking process.**

To be “sustainable,” regulatory actions that the SDWA mandates and authorizes USEPA to carry out must meet several criteria. Known or potentially harmful contaminants that are known or suspected to occur in drinking water must be identified and evaluated in a timely manner. Contaminants must be regulated where a meaningful opportunity for risk reduction exists. Regulations must be set within a predictable and reasonable time frame, be implementable by State Primacy Agencies, as well as be affordable by Public Water Systems of all types and sizes. **An assessment of the “sustainability” of the SDWA and regulations is recommended with regard to small systems.** This includes development of appropriate metrics and indicators to define a sustainable drinking water program as well as a sustainable

small water system, based on a review of the experience gained over the 30 year history of the SDWA.

## **1.0 Introduction**

Drinking water regulations set by the US Environmental Protection Agency (USEPA) under the Safe Drinking Water Act (SDWA) differ according to water system size (e.g., large versus small) and type (e.g., community versus non-community). In some cases, water system size is important when new drinking water regulations are developed. For example, USEPA assesses the availability of treatment technology to comply with drinking water rules based on the cost to large water systems (serving 100,000 or more people), without considering the nearly 50,000 small water systems and their affordability concerns.

This white paper examines SDWA requirements and associated regulations with regard to water system size and type. USEPA regulatory policies that consider water system size and type are also discussed. A full report has been prepared with detailed documentation to support the information and analysis presented here—this white paper summarizes the full report’s analysis, findings, and recommendations.

## **2.0 How Are Public Water Systems Classified?**

Federal drinking water rules established under the SDWA apply to approximately 158,200 Public Water Systems (PWSs). The term “Public Water System” is formally defined in the SDWA statute and by regulation as a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year.

The vast majority of PWSs in the United States are small systems. Community Water Systems (CWSs) serve a year-round residential population. In 2005, 47,703 CWSs served 10,000 people or less, representing 90% of all CWSs.

Beginning in 1987, USEPA began regulating Non Transient Non Community Water Systems (NTNCWSs) separately. A NTNCWS is a PWS that regularly supplies water to at least twenty-five of the same people for at least six months per year, but not year round. Examples include schools, factories, office buildings, and hospitals that have their own water systems. This change was adopted to protect nonresidential populations of more than 25 people who, because of regular long-term exposure, might incur long-term risks of adverse health effects similar to those incurred by residential populations. In 2005, 19,200 NTNCWSs served 10,000 people or less, representing 99.9% of all NTNCWSs.

Also in 1987, USEPA began to exclude Transient Non Community Water Systems (TNCWSs) from most NPDWRs. A TNCWS is a PWS that regularly supplies water at a location where people do not remain for long periods of time, such as a gas station or campgrounds. Based on consideration of volatile organic chemical (VOC) exposure, the Agency concluded that it was not necessary to regulate water systems that only serve transient populations for contaminants with health effects resulting from chronic (life time) exposure. TNCWSs are only regulated for contaminants with health effects resulting from acute (short term) exposure. In 2005, 86,210 TNCWSs, served 10,000 people or less, representing 99.9% of all TNCWSs.

USEPA classifies each water system according to its type: CWS, NTNCWS, or TNCWS. In addition, each water system is classified according its size, as indicated by the



number of people served. In general, “large” water systems serve 10,000 or more persons, while “small” water systems serve less than 10,000 persons.

### **3.0 What SDWA Statutory Requirements Are Based on Size or Type?**

The SDWA is the principal law governing drinking water safety in the United States. Enacted initially in 1974, the law has been amended several times, most recently in 1996. It authorizes USEPA to establish comprehensive national drinking water regulations to ensure drinking water safety. Statutory requirements are those imposed specifically by the SDWA law as enacted and amended by Congress. Most SDWA statutory provisions apply to water systems of all sizes and types. In some cases, however, distinctions are made in the statute based on water system size or type.

Over 30 specific provisions in the SDWA statute differ based on water system size or type.<sup>2</sup> Key provisions based on water system size or type include the following:

- USEPA is required to list affordable compliance technologies for small systems. If USEPA does not determine affordable treatment technologies for a particular regulation, then the Agency must determine variance technologies for small systems. USEPA and Primacy Agencies (States) may give special consideration to providing technical assistance to small Public Water Systems for complying with disinfection requirements.
- USEPA may revise regulations concerning variances and exemptions for small systems to ensure flexibility in the use of variances and exemptions. A variance may be granted on the condition that the system installs the best technology or treatment technique available. USEPA’s finding of best technology or treatment technique available may vary depending on the number of persons served by the system. States can grant variances to: PWSs serving 3,300 or less, and PWSs serving 3,301 to 9,999 with USEPA approval.
- For systems serving 3,330 persons or less which need financial assistance for the necessary improvements, if an exemption is granted, the exemption may be renewed for one or more additional two-year periods, but not to exceed a total of six years.

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<sup>2</sup> See Appendix A of the full report for a complete listing the SDWA statute provisions based on water system size or type.

- In any fiscal year, 15% of State loan funds shall be available only for loans to PWSs serving fewer than 10,000 persons. Each year, 2 % of funds allotted to each State may be used for State technical assistance to systems serving 10,000 or fewer.
- Two of the fifteen members of the National Drinking Water Advisory Council (NDWAC) must be associated with small, rural Public Water Systems.
- If approved by the Governor of the State, water systems serving less than 10,000 are not required to mail their Consumer Confidence Reports (CCRs) to customers. If a water system (serving 500 or fewer) is not required to mail their consumer confidence report, the system may prepare a consumer confidence report and give notice that this report is available, instead of publishing reports.

#### **4.0 What Regulatory Requirements Are Based on Water System Size or Type?**

Drinking water regulatory requirements are set by USEPA under the authority of the SDWA. National Primary Drinking Water Regulations (NPDWRs) promulgated by USEPA are the result of over a dozen major rulemakings and many minor rule amendments promulgated since 1975. NPDWRs contain over 125 specific provisions that differ based on water system size or type.<sup>3</sup> In general, all NPDWRs apply to CWSs but may not apply to NTNCWSs or TNCWSs. Key provisions based on size or type include the following:

- NPDWRs do not apply to water systems that meet all of the following conditions: Consist only of distribution and storage facilities (and do not have any collection and treatment facilities); obtain all water from, but are not owned or operated by, a PWS to which such regulations apply; do not sell water to any person; and are not a carrier which conveys passengers in interstate commerce.
- The regulation for arsenic apply only to CWSs and NTNCWSs.
- The MCL for nitrate is 20 mg/L for NTNCWSs and TNCWSs if certain conditions are met.
- Routine Total Coliform Rule (TCR) monitoring frequency is based on water system size.

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<sup>3</sup> See Appendix B of the Full Report for a complete listing of NPDWR differences based on water system size or type.

- TNCWSs do not test for many organic contaminants. Repeat monitoring requirements are less for water systems serving less than or equal to 3,300 persons. Water systems serving less than or equal to 3,300 persons may composite samples among different systems provided the five-sample limit is maintained.
- Monitoring and compliance requirements for radionuclides only apply to CWSs.
- MCLs for organic contaminants and synthetic organic contaminants apply only to CWSs and NTNCWSs.
- MCLs for asbestos, barium, cadmium, chromium, mercury, selenium, antimony, beryllium, cyanide, thallium, and arsenic only apply to CWSs and NTNCWSs. MCLs for nitrate, nitrite, and nitrate plus nitrite apply to all Public Water Systems. The regulation lists affordable technology, treatment technique, or other means available to systems serving 10,000 persons or fewer for achieving compliance with the arsenic MCL.
- For the TCR, small water systems typically take less than 40 samples/month. The TCR MCL calculation is based on the number of samples taken: (1) If less than 40 samples/month are collected, no more than one sample collected during a month may be total coliform-positive. (2) If at least 40 samples are collected per month, no more than 5.0 % of the samples collected during a month may be total coliform-positive.
- CWSs and NTNCWSs serving fewer than 10,000 persons had two additional years to comply with the MCLs for Total Trihalomethanes (TTHMs), Haloacetic acids (HAA5s), bromate, and chlorite. MCLs for TTHMs, HAA5s, and bromate do not apply to TNCWSs. Chloramines are designated as Best Available Technology (BAT) for compliance only for water systems serving 10,000 persons or more and only for the water served to or purchased by consecutive water systems. Subpart H TNCWSs serving less than 10,000 persons and using chlorine dioxide had two additional years to comply with the chlorine dioxide Maximum Residual Disinfectant Level (MRDL).
- Only CWSs must comply with radionuclide MCLs. Small systems compliance technologies are listed for radionuclides.
- Subpart H water systems serving fewer than 10,000 people were given three additional years to comply with the new turbidity performance criteria under the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR).
- Requirements for lead and copper only apply to CWS and NTNCWSs.
- CWSs and NTNCWSs adding a chemical disinfectant must meet disinfection byproduct (DBP) MCLs and MRDLs. TNCWSs using chlorine dioxide as a disinfectant or oxidant must meet the MRDL for chlorine dioxide.

- Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water were given two additional years to comply with DBP rules.
- Routine and reduced monitoring frequency for TTHMs and HAA5 are based on the number of persons served and source water.
- CCR regulations apply only to CWSs. CWSs and NTNCWSs have slightly different requirements for the form and manner of providing public notices because of the differences in customers served.
- Ground water systems serving greater than 3,300 people must continuously monitor the residual disinfectant concentration. Ground water systems serving 3,300 or fewer people may monitor disinfectant residual using grab sampling.
- Only CWSs must perform an Initial Distribution System Evaluation (IDSE). Stage 2 Disinfection Byproduct Regulations apply to CWSs and NTNCWSs using a primary or residual disinfectant other than ultraviolet light or delivering water that has been treated with a primary or residual disinfectant other than ultraviolet light. Compliance schedules and sampling requirements are based on the population served.
- Small filtered systems may monitor source water for *E. coli* under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) initial monitoring requirements. If *E. coli* levels are low, then small systems can avoid monitoring for *Cryptosporidium*.
- Compliance dates for LT2ESWTR are based on the population served.

## **5.0 What Health Risks From Drinking Water Exposures Are Acceptable?**

USEPA’s approach to reducing risk from drinking water represents a “dual standard” or “multi-tiered” approach to risk reduction. In this regard, a “dual standard” is defined as a regulatory program that contains two or more sets of requirements for the same contaminant applicable to different water systems. USEPA’s policy to exclude NTNCWSs and TNCWSs from some drinking water regulations dates back to 1987. As a result, the Agency has concluded that the incremental increase in risk incurred is acceptable if drinking water is consumed by a CWS resident visiting a NTNCWS or a TNCWS, as a result of a contaminant not being regulated in NTNCWSs or TNCWSs. Other circumstances may exist under which different regulatory

limits may be appropriate for water systems of different types or sizes because these represent a negligible exposure. Although a general rationale exists for excluding NTNCWSs and TNCWSs, it is not clear today whether the overall body of drinking water regulations developed over the prior 20 years represents the best overall approach to risk reduction and public health protection for small water systems.

**An assessment of the cumulative impact of current regulations on all small water systems (CWSs, NTNCWSs, and TNCWSs), risk reduction effectiveness, and the remaining health risks is recommended to determine whether an alternative regulatory approach to the current SDWA and NPDWRs (or revisions thereof) can achieve public health protection with greater economic efficiency.** This assessment should include a re-examination of USEPA's 1987 decision to globally exclude certain water systems from certain regulatory limits, as well as consideration of expanding the current multi-tiered standard setting approach to other circumstances representing de minimis exposure.

### ***5.1 Are Drinking Water Health Goals Reasonable?***

Drinking water regulatory limits are conservative—but are they too conservative? If drinking water standards are too conservative then small water systems would incur costs higher than necessary to protect public health. The SDWA does not specifically require drinking water health goals, known as maximum contaminant level goals (MCLGs), to be set without regard to water system size or type—however, this has been USEPA's practice since the SDWA was enacted. MCLGs are non-enforceable, but represent a health goal that all water systems are expected to strive to achieve. Understanding how MCLGs are set is necessary to determine whether drinking water standards overall are too conservative.

The methodology for establishing MCLGs differs for contaminants that are considered carcinogens via ingestion compared to contaminants that are non-carcinogens.<sup>4</sup> In the legislative history of the SDWA, Congress voiced the general philosophy that *as a goal*, carcinogens should not be present in drinking water at any level. Since the early 1980's, USEPA has followed the general policy that as a goal, ideally, drinking water should be free from avoidable contamination and health risks, and that water quality degradation should not be permitted.

Setting an MCLG of zero for carcinogens via ingestion represents an unattainable goal. Such an MCLG has no direct bearing on the MCL, which must be set based on analytical detection, treatment feasibility, and cost. Carcinogen concentrations that routinely fall below a  $10^{-6}$  lifetime estimated risk are essentially negligible compared to other known causes of cancer. Such small projected risks simply cannot be verified in the real world, and may in fact be zero. Setting the MCLG to zero for carcinogens ensures that drinking water standards remain open to revision in the future based on improvements in analytical methods or treatment technology, and not because of increased concern over health risk because concentrations may be detectable at lower and lower levels, while the health risk still remains negligible.

For effects other than cancer, USEPA develops an oral reference dose (RfD) for drinking water contaminants. The RfD is defined as an estimate of the daily exposure that is not expected to produce adverse effects over a person's lifetime. To calculate the RfD, available toxicity data are analyzed and uncertainty factors are applied to account for sensitive populations. Each area of uncertainty must be evaluated (e.g., extrapolation of animal data to humans) and a value is assigned from 1, 3, or 10 depending on the strength of the available data. A threefold factor is used when data are available to reduce the need to apply a 10-fold unit of uncertainty. An

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<sup>4</sup> See Section 5.1 of the full report for an expanded discussion of how MCLGs are established.

uncertainty factor of 1 is applied when the data are clearly from the most sensitive members of the population. The net uncertainty factor is the product of the individual uncertainty factors applied to a specific contaminant. Uncertainty factors tend to range from 1 to 3,000-fold. Uncertainty factors greater than approximately 3,000 indicate too much uncertainty for the risk assessment to be meaningful.

Since 1989, the MCLG for microbial contaminants is zero. The Agency's policy is to assume that exposure to only one viable microbial pathogen (e.g., *Giardia* cyst) is sufficient to cause infection.

### ***5.2 Are MCLs Realistic?***

The SDWA requires that MCLs be set as close to the MCLG as feasible, using best technology, treatment techniques, or other means, taking cost into consideration. MCLs are set considering the contaminant MCLG, the practical quantitation (detection) limit, treatment feasibility, and cost. For many small water systems the "bar" of certain regulations appears to be set too strictly with respect to their ability to pay and to comply within the statutory time limit. This has naturally resulted in questions being asked as to the appropriateness of drinking water standards set by USEPA.

USEPA's policy is to set drinking water MCLs for carcinogens within an acceptable risk range of  $10^{-4}$  to  $10^{-6}$ , which was supported by the 1984 World Health Organization guidelines. The Agency considers cancer risks within this range to be safe levels and protective of public health. Note that the concept of acceptable risk does not apply to non-cancer effects, since regulatory limits are based on preventing any such effect. Since 1989, USEPA policy is to ensure treatment achieves less than one case of microbiologically caused illness per year per 10,000 people.

### ***5.3 How Are Costs Considered?***

USEPA has generally limited consideration of economic costs under the SDWA to whether a technology is affordable for large municipal water systems. This policy was originally based on a floor statement of one legislator recorded in the legislative history of the 1974 SDWA. This floor statement also asserted that larger water systems are to be encouraged and small water systems are to be discouraged.<sup>5</sup> The policy interpretation of only considering large water system costs was reaffirmed in a floor statement of one legislator recorded in the legislative history of the 1986 SDWA amendments. However, the SDWA and its legislative history *do not* require the Agency to consider only large water system costs. Floor statements by individual legislators as recorded in the legislative history, while entitled to some weight, do not effectively restrict Agency discretion to adopt statutory interpretations which are otherwise reasonable and consistent with the statute.

Considering only large water system costs when determining treatment methods generally available propagates an economic disparity that places small water systems at an economic disadvantage. Although the 1996 SDWA amendments and capacity development programs have provided USEPA some flexibility and tools to address the issues facing small systems, the historical policy of discouraging small systems has contributed to a lack of attention to solving real-world small water system technical, managerial, and financial capacity issues. When installing treatment technology, small water systems simply do not realize the same economy of scale as large water systems.

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<sup>5</sup> See Section 5.3 of the Full Report for the exact quotes from the SDWA legislative history.



**Historically, small water system costs have not been properly considered when determining methods generally available to comply with drinking water regulations.** The current USEPA policy and practice of considering only large water system treatment costs in establishing methods that are generally available is inappropriate.

#### ***5.4 When Are New Contaminants Regulated?***

The SDWA statute gives USEPA the authority to set a NPDWR for a contaminant if all of the following conditions are met:

- The contaminant may have an adverse effect on the health of persons,
- The contaminant is known to occur or there is a substantial likelihood that the contaminant will occur in Public Water Systems with a frequency and at levels of public health concern, and
- The regulation of the contaminant presents a meaningful opportunity for health risk reduction for persons served by Public Water Systems.

The third requirement that there be a meaningful opportunity for health risk reduction in order for USEPA to regulate a contaminant was added by the 1996 SDWA amendments. It does not apply to contaminants regulated prior to 1996. The 1996 SDWA amendments require USEPA to review and revise, as appropriate, each NPDWR, not less often than every six years. An anti-backsliding provision was also added in 1996; any revision of an NPDWR must maintain, or provide for greater, protection of the health of persons. A meaningful opportunity for risk reduction must exist for a new contaminant to be regulated. This assessment is made without regard to water system size or type.

## **6.0 What Enforcement Actions Are Possible?**

Water systems having difficulty complying may violate one or more NPDWRs and be subject to formal enforcement action. Enforcement action may take the form of an administrative order, civil action, criminal action, or citizen lawsuit depending upon the circumstances of the violation. The SDWA includes certain tools that USEPA and States may apply to assist struggling water systems in complying with drinking water rules in order to avoid noncompliance and/or formal enforcement action. These include technical assistance, exemptions, and variances. In addition, some States have used bilateral compliance agreements to allow water systems more time to comply.

Granting a water system an extension of time to comply with a regulation does not solve the underlying problem—which is almost always a lack of funding. A water system, given additional time to comply whether through a variance, exemption, administrative order, or bilateral compliance agreement, must still find the funding needed for water system improvements, as well as paying for the cost of its attorneys fees to respond USEPA's enforcement action.

### ***6.1 Is Technical Assistance Provided?***

Technical assistance to small water systems has been an important aspect of implementing the SDWA since it was enacted in 1974. The SDWA includes provisions authorizing funding for technical assistance to small water systems. Typically, the level of funding appropriated for technical assistance is lower than the need.

## ***6.2 Are Exemptions Available?***

The SDWA includes exemption provisions intended to provide compliance flexibility in certain cases. Exemptions are intended to provide temporary relief by giving a water system more time to comply. States or USEPA may grant exemptions from a standard if, due to certain compelling factors (including cost), a system cannot comply by the regulatory deadline.

For example, all systems were required to comply with the new arsenic standard five years after its promulgation date. An exemption would allow three more years for qualified systems. Small systems (serving 3,300 persons or fewer) may be eligible for up to three additional two-year extensions, for a total exemption duration of nine years (and for a total of up to fourteen years to achieve compliance). USEPA has acknowledged that exemptions are intended to be an important tool to help States address water systems needing financial assistance to comply with SDWA rules, although exemptions are not widely granted by States.

Granting of exemptions by USEPA has reportedly been inconsistent. In the past, some water systems were granted open ended exemptions for an indefinite time period to time by their State, which went unchallenged by USEPA. Now, water systems impacted by new rules (e.g., arsenic, radionuclides, etc.) are asking why their water system can't also be granted an open-ended exemption. In general, regulators believe that granting open-ended exemptions undermines the purpose and intent of the SDWA. In addition, State policies regarding issuance of exemptions and enforcement action differ, sometimes differing even within a particular State, depending upon the personnel involved. Note that a small community in prolonged economic distress with a water system in noncompliance may have no other choice but to apply for an exemption and apply for renewal on an on going basis. SRF funding or other federal loan

support alone will not solve a small water system's financial inability to pay for on going capital and operating costs in severe economically depressed areas.

**Exemptions are intended under the SDWA as one component of the full range of enforcement flexibilities available to assist small water systems in complying with SDWA regulations.** Enforcement tools intended by the SDWA include technical assistance, exemptions, small system variances, variances, as well as formal enforcement action and compliance orders.

To grant an exemption (or a variance), action must be taken by the water system to ensure that an unreasonable risk to health (URTH) does not exist. To ensure an URTH does not exist, provision of bottled water or installation of a point-of-use (POU) or point-of-entry (POE) treatment may be required.

Precautionary assumptions are used to develop drinking water MCLGs and MCLs that result in a degree of conservatism that differs with the contaminant. Although MCLGs are set without regard to water system size or type, once an MCLG is set, the enforceable MCL must be set as close as feasible to the MCLG. In 1998, USEPA adjusted precautionary assumptions used to establish MCLs for 80 contaminants regulated prior to 1996 to determine URTH values reflecting the shorter exposure period associated with a variance or exemption. Eight (8) contaminants (10%) were not eligible for URTH values, 19 contaminants (24%) have an URTH value equal to their MCL, and 53 contaminants have URTH values equal to or greater than twice the MCL. Regulators generally object to relaxing drinking water standards above the MCL for purposes of determining an URTH level because they believe it results in differential health protection as well as having two health limits (the MCL and URTH levels) that will confuse the public.

As discussed above, current USEPA policies have established a multi-level, differential health protection under the SDWA based on water system size and type. URTH values are intended to be applied at a specific community only for a limited period of time (e.g., seven years) depending upon the duration of the variance or exemption. Since URTH determinations are specific to the particular water system being granted the variance or exemption, a small community would not experience a practical increase in risk even if an URTH level was set two or three times the MCL. For example, a community of 1,500 people with a carcinogen in the drinking water with an MCL set at the highest risk allowable of  $10^{-4}$  could theoretically expect 0.15 cancer cases over 70 years (assuming the consumption of two liters per day of drinking water containing the contaminant at the MCL). If the URTH level was set at 2x or 3x the MCL, then the resulting expected value of theoretical cancer cases would be 0.3 cases and 0.45 cases, respectively, over 70 years. For each community where a variance or exemption is being considered, an URTH level slightly above the MCL could be determined where the theoretical increase in health risk is negligible and has no practical meaning for that community.

Existing MCLGs and MCLs have been set based on best professional judgments—and therefore arbitrary changes are not justifiable. As mentioned above, in 1998 USEPA examined precautionary assumptions and toxicological uncertainty factors used to set MCLs, and determined URTH levels for most contaminants that are higher than the MCL (e.g., 2x, 3x, or more). **URTH values have been determined for arsenic and should be determined for other contaminants regulated after 1996, and should be determined for other contaminants regulated after 1996. URTH levels should be applied on a case-by-case, community-by-community basis for a defined period of time depending upon the duration of the variance or exemption.** The SDWA requires the State to provide notice and opportunity for public

hearing on a compliance schedule to be included with an exemption. Therefore, consumers would have an opportunity to comment on the acceptability of an URTH level above an MCL. Exposure considerations (e.g., setting an allowable short-term level considering the contaminant concentration and anticipated years of exposure) can also provide an alternative basis for determining URTH levels (e.g., arsenic URTH values).

### *6.3 Are Small System Variances Available?*

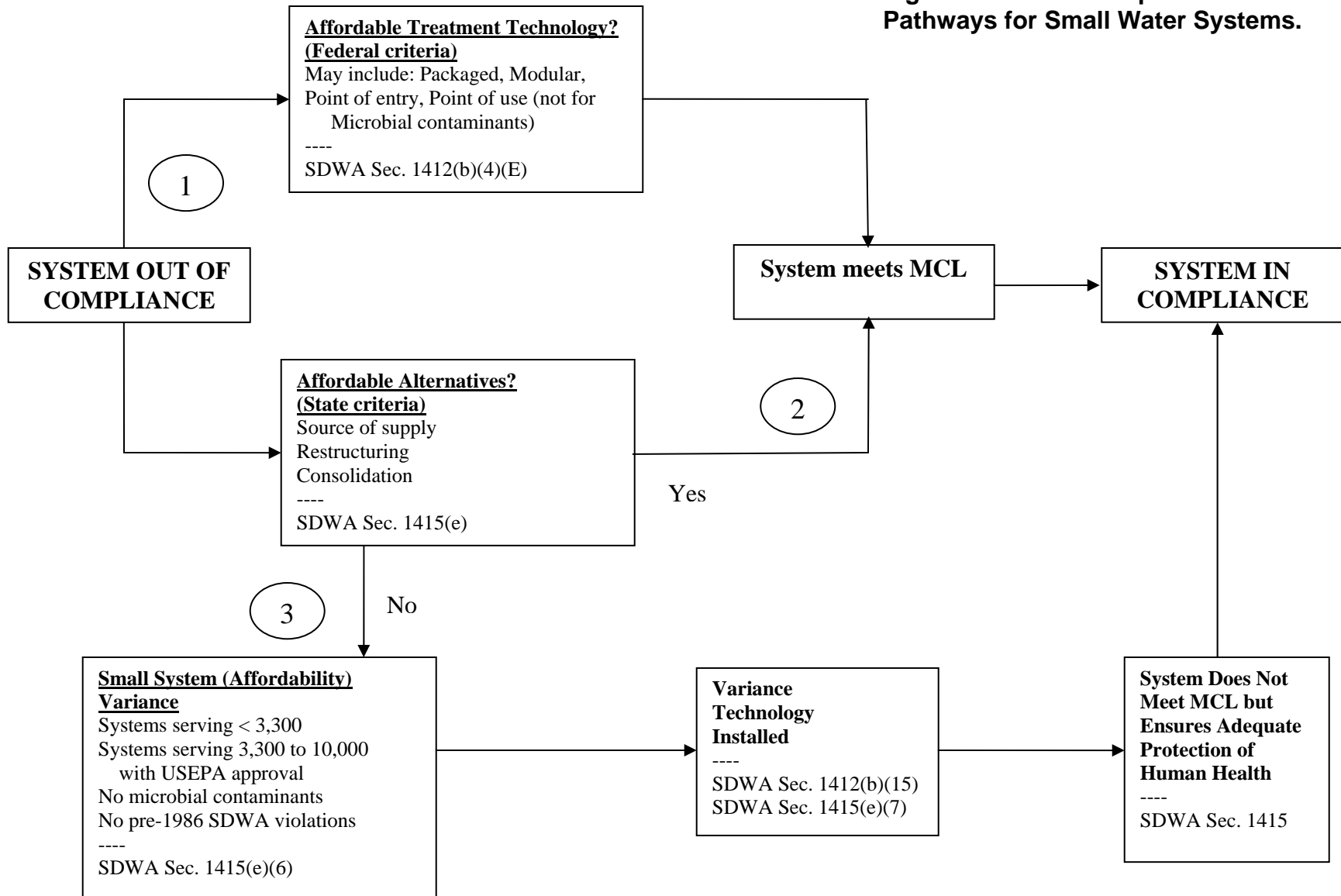
**The SDWA small system variance provision is intended to offer a more permanent form of relief (compared to exemptions) and provide compliance flexibility for small water systems. Small system variances as intended by the 1996 SDWA amendments have not been effectively implemented.** SDWA compliance pathways for small water systems out of compliance are shown in Figure 1. The 1996 SDWA requires USEPA to identify technologies in each regulation that meet the standard and that are affordable for systems that serve populations of 10,000 or fewer. If affordable “compliance” technologies are not identified, then the Agency must identify small system “variance” technologies.

A key aspect of the SDWA variance provision is the concept of “affordability.” The SDWA statute and its legislative history do not specifically define what constitutes an affordable regulation. Two levels of affordability are important—national-level and system-specific. National-level affordability criteria were set in 1998 by USEPA at 2.5% of Median Household Income (MHI) for the express purpose of making determinations of affordable variance technology.

USEPA evaluated the affordability of a standard or treatment technology by determining whether the compliance cost would raise the total water cost above 2.5% of annual MHI in three categories of small systems. Using this approach, the Agency has determined that affordable

compliance technologies are available for every drinking water regulation. Consequently, the Agency has not identified any small system variance technologies, and thus, no small system variances are available.

**Figure 1. SDWA Compliance Pathways for Small Water Systems.**





System-level affordability criteria are to be used by States to make decisions about whether a particular water system should receive a small system variance. As a practical matter, the availability of a small system variance (or exemption) for a particular water system should be based on local circumstances, local income levels, and local URTH determinations (discussed above), and should not be based solely on or trumped by national criteria. Indeed, the SDWA allows USEPA to review and object to the issuance of any variance. To date, national-level affordability criteria has been applied in a manner that has resulted in elimination of the possibility of small system variances for small systems facing local financial distress. The historical attitude of regulators to discourage small systems, as noted above, may in part have contributed to the lack of progress regarding implementation of the SDWA variance and exemption provisions. In any case, if the small system variance program is not acceptable to regulators and/or cannot be implemented in its current form in good faith, then this SDWA program should be revised or replaced with a program that can provide relief to struggling small systems in a manner intended by Congress.

**Reasonable national affordability criteria is needed, however, as a practical matter, regulatory decisions to grant a small system variance should be driven primarily by local circumstances, local income levels, and local URTH determinations.**

#### ***6.4 Should USEPA's Affordability Criteria Be Revised?***

USEPA continues to rely on MHI to measure what communities can afford to pay to comply with drinking water regulations. The Agency believes water system-level MHI is the appropriate income metric for determining water system affordability because (1) MHI data are available nation-wide, (2) the calculation of system-level MHI is simple (based on readily available Census data), and (3) the metric can be easily understood. USEPA believes that MHI

provides a consistent income-based metric for determining affordability or “ability to pay” for new drinking water regulations. Also, the National Drinking Water Advisory Committee (NDWAC) supported the use of system-level MHI as the metric for determining small water system affordability.

MHI by itself, however, has been shown to be an inaccurate measure of the ability of a community to afford increased water costs. There is a significant difference between small water systems that are located in metropolitan areas and those that are located in non-metropolitan areas. Non-metropolitan area water systems are in communities with a significantly lower level of economic resources. Even so, affordability is not just a small system issue, and any revised policy regarding consideration of costs and affordability must address this issue for water systems of all sizes. In addition, to date there has been no discussion or consideration of the relationship between drinking water affordability and the economic prosperity of a community. The economic health of a community, whether a small town or large metropolitan area, is reflected in measures of household financial distress, and not captured by the MHI metric.

In addition, the MHI determination is based on Census data which is only updated every 10 years. Hence, a national-level affordability determination does not consider current economic conditions faced at the local level. To date there has been no discussion or consideration of the effect of the current economic recessionary conditions on the consumers’ ability or willingness to pay higher costs for drinking water improvements to meet new regulations in small or large water systems.

In 2006, the Agency proposed to revise its affordability criteria, acknowledging that revisions are needed to address communities with below average incomes or above average drinking water and treatment costs. In 2007, USEPA’s affordability policy was nominated to the

Small Business Administration's (SBA) Office of Advocacy for revision under the Regulatory Review and Reform (r3) initiative. SBA identified "Flexibility for Community Drinking Water Systems," focusing on USEPA's affordability policy, as one of the "Top 10" nominated rules, and has transmitted this policy to USEPA for review and reform.

**MHI must be supplemented with other measures to more accurately represent the percentage of households in poverty, living in poverty areas, or households in financial distress. This applies to small systems as well as large water systems that have a high percentage of households in financial distress.**

Note that historically, responses traditionally offered by regulators and Congress in response to concerns raised by small water systems over drinking water affordability include consolidation or restructuring, federal funding, and/or improving asset management. Consolidation or restructuring is often encouraged and sometimes forced by regulators to avoid proliferation of unsustainable water systems. But this approach is frequently not practical, especially in rural areas. Regulators and members of Congress also typically point to the SRF program as a source of federal funding for small water systems, or additional federal funding programs are proposed (e.g., establishing a new drinking water trust fund). Though promised, additional federal funding has not materialized for small water systems since the SRF program was authorized by Congress in 1996. Even if made available, additional federal funding will not necessarily result in a sustainable small water system. In reality, many struggling small water systems do not have a sufficient rate base to support additional loan repayments, even for low interest loans, given their current level of indebtedness. Offering grants may help some water systems in the short term, but long term sustainability will not be achieved if a community

cannot afford to pay ongoing operation and maintenance costs and future capital replacement costs.

Small water systems are typically urged to do a better job of financial planning and asset management if they are facing economic hardship. This is prudent to ensure that a small water system is managing its economic resources as best as possible. For some small water systems improving asset management will, in part, enable them to achieve sufficient financial capacity to maintain compliance. However, most small water systems are not complicated and do not typically require sophisticated asset management plans. Small water systems without a sufficient customer base and small communities in financial distress due to local or regional recessionary economic conditions will not solve their problem of insufficient financial capacity with better asset management.

### ***6.5 What Are Compliance Agreements?***

Compliance agreements are essentially similar to an administrative order in that the non-complying water system and State agree to an enforceable compliance schedule. As a condition, the water system would be required to take action (e.g., provide bottled water) to ensure that there is no unreasonable risk to health. The non-complying water system may or may not be fined for its noncompliance. As long as the water system meets the compliance schedule and conditions, it will be considered in compliance.

### **7.0 Are Point of Use and Point of Entry Treatment Allowed?**

The 1996 SDWA amendments added requirements regarding the design, management, and operation of POU and POE treatment units used to achieve compliance with an MCL. USEPA issued technical guidance on POU and POE treatment in July 2006. Existing regulations govern State programs implementing POU and POE treatment for compliance and as a condition

of a variance or exemption. POU technologies are listed as Small System Compliance Technologies (SSCTs) for several MCLs. Although POU and POE are allowed, there is still resistance by some State regulators to the use of this technology because of past adverse experiences.

**Guidance is needed for small water systems and State regulators on how to effectively implement POU and POE for compliance.** Case studies of positive experiences with POU and POE should be provided as a model to State regulatory agencies and small water systems.

## **8.0 Is Bottled Water Allowed?**

USEPA's policy prohibiting use of bottled water to achieve compliance with an MCL was instituted in 1987 and is not expected to be revised or changed. USEPA continues to limit use of bottled water to very specific circumstances such as emergencies or as a temporary measure under variances and exemptions. There continues to be no statutory prohibition on the use of bottled water to achieve compliance—only a regulatory prohibition. It is likely that bottled water may only be appropriate for small system compliance under limited circumstances. Even so, the circumstances under which bottled water would be appropriate should be identified and regulations revised to allow its use.

**A study is recommended examining the feasibility of using bottled water for MCL compliance in small systems.** The study findings, if favorable, could be used to support a change in USEPA policy and/or amendment of the SDWA. If bottled water is to be used as a small system compliance technology or as “other means” to comply with an MCL, then USEPA's current policy must be revised and/or the SDWA must be amended to designate bottled water as an acceptable means for compliance.

## **9.0 How Can Small Water System Representatives Participate in the Regulatory Process?**

Advisory committees to USEPA such as the NDWAC typically have a small minority representation from small water systems. As a result, there may be little opportunity to influence advisory committee deliberations because of the large number of members representing other interests. Although 97% of the 158,221 total PWSs in the U.S. serve 10,000 persons or less, only two of fifteen NDWAC members (13%) represent small water system interests. Note that the SDWA does not restrict USEPA from appointing more than two representatives from small water systems.

Overall, twenty seven standing and temporary advisory committees past and present have advised USEPA on SDWA and/or drinking water related issues. These committees have had an overall total of 495 members, of which 49 (10%) have represented small water systems.

There are several ways small water systems can be effectively involved in the rulemaking process, including participation on stakeholder committees, submitting comments on proposed rules, and participating in review panels convened under the Regulatory Flexibility Act (RFA). By participating, small water systems may have some influence on the regulatory outcome. Although it may seem to be a very small impact, not participating will ensure that small systems will have no influence at all.

**Representatives of small water systems should take advantage of all opportunities to participate at each step in the rulemaking process. It is very important to submit data and reasoned arguments as persuasively as possible during the rulemaking process.**

## 10.0 Conclusions and Recommendations

The discussion presented in this white paper has resulted in the following conclusions and recommendations:

1. NPDWRs represent a “multi-level” approach to risk reduction under the SDWA. Since 1987, certain regulations only apply to certain types of water systems. In addition, compliance deadlines are typically extended for small water systems. Regulations have been adopted and implemented in an incremental, piecemeal fashion over a 30 year period as the SDWA statute has been amended. **An assessment of the cumulative impact of current regulations on small water systems (CWSs, NTNCWSs, and TNCWSs), risk reduction effectiveness, and remaining health risks is recommended to determine whether an alternative regulatory approach to the current SDWA and NPDWRs (or revisions thereof) can achieve public health protection with greater economic efficiency.** This assessment should include a re-examination of USEPA’s 1987 decision to globally exclude certain water systems from certain regulatory limits, as well as consideration of expanding the current multi-tiered standard setting approach to other circumstances that represent de minimis exposures.
2. USEPA has generally limited consideration of economic costs under the SDWA to whether a technology is affordable for large municipal water systems. Considering only large water system costs when determining treatment methods generally available, propagates an economic disparity that places small water systems at an economic disadvantage. **Historically, small water system costs have not been properly**

**considered when determining methods generally available to comply with drinking water regulations.** The USEPA practice of considering only large water system treatment costs in establishing methods that are generally available is inappropriate.

3. Exemptions are intended to provide temporary relief by giving a water system more time to comply, but granting of exemptions by regulatory agencies has reportedly been inconsistent. **Exemptions are intended under the SDWA as one component of the full range of enforcement flexibilities to be available to assist small water systems in complying with SDWA regulations.**
  
4. **URTH values have been determined for arsenic, and should be determined for other contaminants regulated after 1996. URTH levels should be applied on a case-by-case, community-by-community basis for a defined period of time depending upon the duration of the variance or exemption.** The SDWA requires the State to provide notice and opportunity for public hearing on a compliance schedule to be included with an exemption. Therefore, consumers would have an opportunity to comment on the acceptability of an URTH level above an MCL. Exposure considerations (e.g., setting an allowable short-term level considering the contaminant concentration and anticipated years of exposure) can also provide an appropriate basis for determining URTH levels (e.g., arsenic URTH values). URTH values have been determined for arsenic, and should be determined for other contaminants regulated after 1996.



5. **The SDWA small system variance provision is intended to offer a more permanent form of relief (compared to exemptions) and provide compliance flexibility for small water systems. Small system variances as intended by the 1996 SDWA amendments have not been effectively implemented.** Small system variances as intended by the SDWA should be implemented by regulatory agencies in good faith, or the SDWA should be amended to replace small system variances with a workable approach that can help struggling small systems comply with drinking water regulations. **Reasonable national affordability criteria are needed. However, as a practical matter, regulatory decisions to grant a small system variance should be driven primarily by local circumstances, local income levels, and local URTH determinations.**
  
6. USEPA continues to rely on median household income (MHI) to measure what communities can afford to comply with drinking water regulations. **MHI must be supplemented with other measures that more accurately represent the percentage of households in poverty, living in poverty areas, or facing household financial distress. This applies to small systems as well as large water systems that have a high percentage of households in financial distress.**
  
7. **Guidance is needed for small water systems and State regulators on how to effectively implement POU and POE for compliance.** Case studies of positive experiences with POU and POE should be provided as a model for State regulatory agencies and small water systems.

8. **A study is recommended examining the feasibility of using bottled water for MCL compliance in small systems.** The study findings, if favorable, could be used to support a change in USEPA policy and/or amendment of the SDWA. If bottled water is to be used as a small system compliance technology or as “other means” to comply with an MCL, then USEPA’s current policy must be revised and/or the SDWA must be amended to designate bottled water as an acceptable means for compliance.
  
9. **Representatives of small water systems should take advantage of all opportunities to participate at each step in the rulemaking process.** It is very important to submit data and reasoned arguments as persuasively as possible during the rulemaking process.
  
10. To be “sustainable,” regulatory actions that the SDWA mandates and authorizes USEPA to carry out must meet several criteria. Known or potentially harmful contaminants that are known or suspected to occur in drinking water must be identified and evaluated in a timely manner. Contaminants must be regulated where a meaningful opportunity for risk reduction exists. Regulations must be set within a predictable and reasonable time frame, be implementable by State Primacy Agencies, as well as be affordable by Public Water Systems of all types and sizes. **An assessment of the “sustainability” of the SDWA is recommended with regard to small systems.** This includes development of appropriate metrics and indicators to define a sustainable drinking water program as well as a sustainable small water system, based on a review of the experience gained over the 30 year history of the SDWA.